

ISSUE 3 , DECEMBER 2015

Research *for* health



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**A World
Without
Cancer**

**Unpacking
the Puzzles of
Childhood Asthma**

**Mapping Access to
Primary Health Care**

Light Saving Lives



SHRF ACHIEVEMENT AWARD 2015

The Saskatchewan Health Research Foundation (SHRF) is pleased to present the Achievement Award to Dr. Debra Morgan. She is a Professor and Chair in Rural Health Delivery at the Canadian Centre for Health and Safety in Agriculture (CCHSA). Dr. Morgan and her team continue to make remarkable advances in the health care system, particularly in the areas of rural and remote dementia care. Her ability to foster international collaborations, while leading change in Saskatchewan makes Dr. Morgan the most worthy candidate for this year's award.

Congratulations Dr. Debra Morgan!



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through health research*

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Light Saving Lives
 The Canadian Light Source

Research for health



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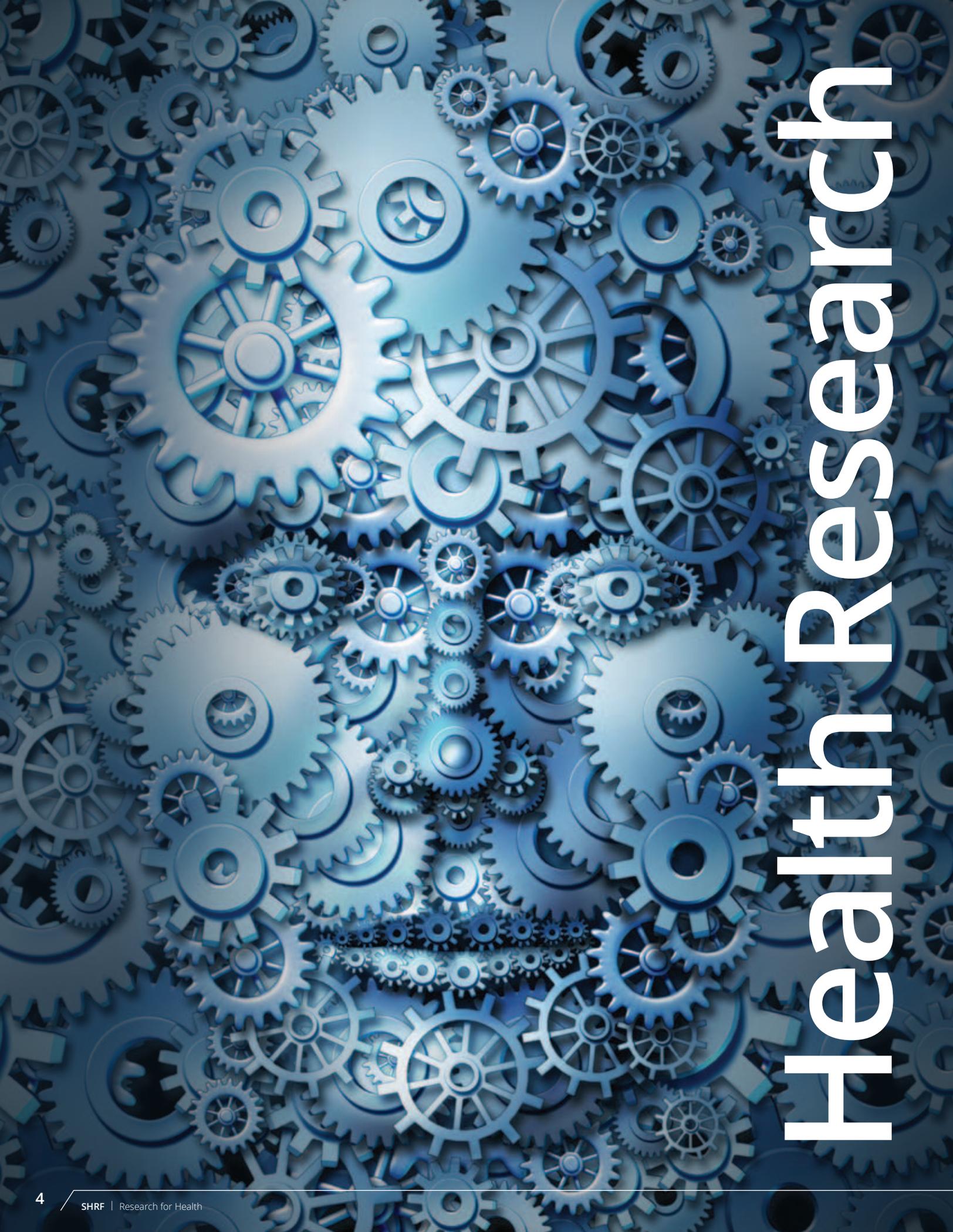
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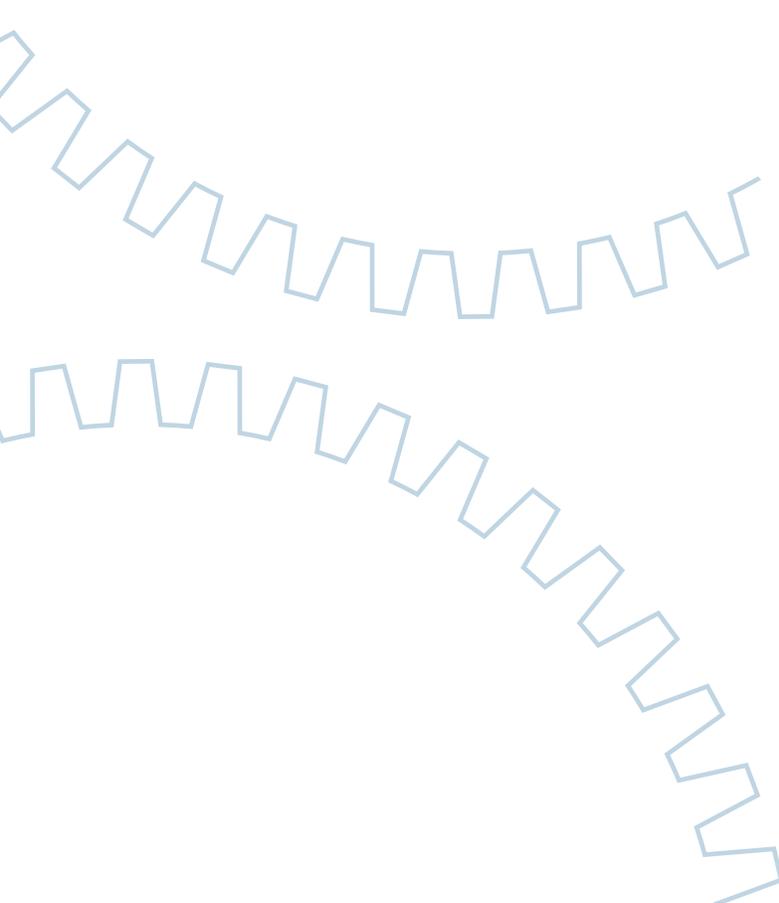
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Cover Image:
 Saskatchewan Indian Institute of Technologies (SIIT) graduate Jerrilee and her daughter Kayla.
 Photo courtesy of SIIT.



Health Research



A look at research and innovation in Saskatchewan

At Work

When we talk about health research, the focus is typically on major discoveries, causes for disease, new health risks or improved medical practices. Researchers in Saskatchewan are indeed answering some of these questions and making an impact on local and global health.

Did you know that Saskatchewan is home to some of the most advanced research technologies in the world? Not to mention researchers that are developing vaccines for tuberculosis and sexually transmitted diseases, such as chlamydia, or tackling local health issues by working directly with Aboriginal, rural and remote, and farming communities.

Perhaps, then, it's no surprise that the province which pioneered Medicare continues to lead in systems-wide thinking about how to improve the health of Canadians. Saskatchewan's emphasis on quality, leadership and the patient are broadly integrated across the whole provincial health system. These key elements define how Saskatchewan approaches health research innovation and

investments. In addition, the province's post-secondary institutions, health regions and research centres are major innovation drivers, setting Saskatchewan up to be a powerhouse when combined with our strengths in agriculture and mining.

Underlying the provincial health research and innovation system is the Saskatchewan Health Research Foundation (SHRF). The Foundation is the provincial agency responsible for funding, facilitating and promoting innovative, collaborative health research in Saskatchewan. This funding at the provincial level has not only played a key role in attracting and retaining top researchers, but has made Saskatchewan a place where we continue to push the boundaries in health research.

This magazine showcases researchers, partners and research centres that drive Saskatchewan's health innovation system and the integral research that is being done in the province. 

A World Without CANCER



A world without cancer, what would that be like? It seems like an insurmountable goal, but for Dr. Franco Vizeacoumar, Research Scientist at the Saskatchewan Cancer Agency and Adjunct Professor in the College of Medicine at the University of Saskatchewan, it is something that is constantly in the back of his mind as he pushes the boundaries in cancer research.

"We have this thing in our house," says Vizeacoumar, "where my wife will make me repeat things she says to make sure I am actually listening, because she knows I am constantly thinking about the research."

Like so many others, Dr. Vizeacoumar has lost relatives to cancer, which is a motivating factor for why he is so passionate about this research. "The disease isn't a one person disease. It impacts families and communities," he says.



Dr. Franco Vizeacoumar, Research Scientist at the Saskatchewan Cancer Agency and Adjunct Professor in the College of Medicine at the University of Saskatchewan

The Canadian Cancer Society statistics reveal that this year alone an estimated 2,400 people will die of cancer in Saskatchewan, and 5,500 new cases will be diagnosed. Currently, radiation therapy and chemotherapy have been the only two treatment strategies to fight most cancer types apart from very few limited successes in targeted therapies. Unfortunately, these treatments cause substantial damage to normal tissue. "That is the key issue, none of it is targeted," says Vizeacoumar. "We are just doing it blindly."

In 2015, Dr. Vizeacoumar was awarded a SHRF Establishment Grant to explore Synthetic Dosage Lethality (SDL) of genes in colorectal cancer with the goal of developing targeted therapy that selectively kills cancer cells while minimizing toxicity towards normal cells. SDL arises when a combination of mutations in two or more genes leads to cell death.

During Dr. Vizeacoumar's postdoctoral training at the University of Toronto, he developed a screening platform that can look at every single gene in the genome (i.e., 20,000) and figure out which gene combination will lead to cell death.

"We are building the Google map of cancer cells," says Vizeacoumar. "Think about it like blocking traffic. If we want to block traffic from the east to west end of the City of Saskatoon, what do we do? We would block routes or roadways to prevent the passage of traffic." This is essentially what Dr. Vizeacoumar and his team are doing with cancer cells.

However, the main challenge with cancer cells is they only focus on dividing with signals that go from A to B.

"If we try to block the route from A to B," says Vizeacoumar, "cancer cells will find a different route through C to reach B. But if we have the complete Google map of cancer cells, we will know where to block and perhaps when to block."

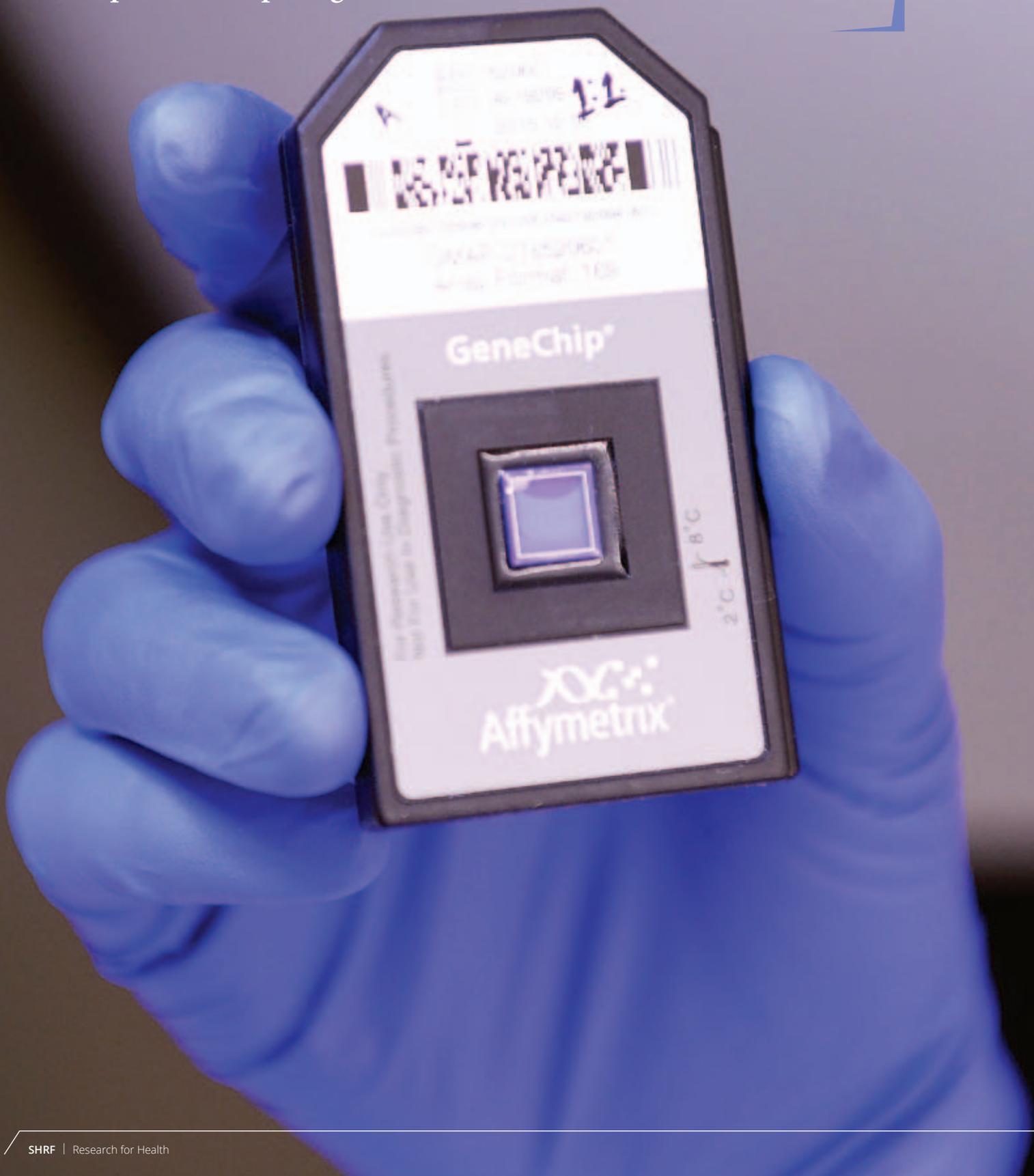
While there are 20,000 genes in the genome that do the same function over and over again, you can't just study a single gene by itself, you have to study it in the context of how it actually works with other genes within the network.

"Our lab studies all the 20,000 genes together in a very unbiased and systematic fashion," says Vizeacoumar. "We don't just pick and choose our favourite genes." For example, the lab looks at both a normal cell and tumour cell to identify how the cells are wired differently with the objective of finding any short circuit in their circuitry network that will shoot down the tumour cells and not the normal cells.

In a span of three to four weeks, the screening platform allows Dr. Vizeacoumar to turn off every single gene in the genome, and then specifically identify which genes to turn off so that it only kills the tumour cells and not the normal cells, all of which is being done in a petri dish.

Dr. Vizeacoumar's Systems Biology and Cancer Genomics Lab is located in the Cancer Cluster at the University of Saskatchewan. The Cancer Cluster is a partnership between the Saskatchewan Cancer Agency and the College of Medicine to bring like-minded researchers that are working for the same cause together.

“We are building the Google map of cancer cells,” says Dr. Vizeacoumar. “Think about it like blocking traffic. If we want to block traffic from the east to west end of the City of Saskatoon, what do we do? We would block routes or roadways to prevent the passage of traffic.”



Dr. Franco Vizeacoumar, Research Scientist at the Saskatchewan Cancer Agency and Adjunct Professor in the College of Medicine at the University of Saskatchewan



Celebrating 85 Years of Making a Difference



At the Saskatchewan Cancer Agency, we are making a difference — through our prevention and early detection programs, high quality cancer treatment, supportive care, and innovative research. Find out more at www.saskcancer.ca.

It is a long way from Pondicherry, India where he was born and raised, earning his undergraduate degree at Pondicherry University, a PhD from the University of Alberta, and a postdoctoral from the University of Toronto. With only a handful of labs in North America doing this type of research, Dr. Vizeacoumar and his team are excited about the way the lab is conducting this research and the prospects it brings to Saskatchewan.

“There is no reason that Saskatchewan can’t be a leader in cancer research,” says Vizeacoumar. “We have the infrastructure, support and researchers capable of doing it.”

Although the study focuses on colorectal cancer, the findings will have broad applicability. The hope is that the research will provide us with the knowledge necessary to develop targeted therapy that kills cancer cells in various forms of cancer such as breast or prostate.

Without any hesitation, Dr. Vizeacoumar says, “a world without cancer isn’t unattainable. There is still a lot more work that needs to be done, but with the power of technology and genome medicine we are making great progress.” As Dr. Vizeacoumar continues to raise the bar in cancer research, he humbly refers to his research as a small speckle among a larger research community, a research community dedicated to finding a cure for cancer.

The background is a dark blue gradient with a microscopic theme. In the upper right, a white line-art bacterium with a long, tapered body and several flagella is shown. The rest of the background is filled with out-of-focus, glowing blue circular shapes that resemble cells or bacteria. In the bottom left corner, there is a dark grey silhouette of a cell with a nucleus and several protrusions.

Stopping the
infection before
it happens

'Superbou

More than 18,000 hospitalized patients in Canada acquire multi-drug-resistant strains of bacteria each year. By 2050, it is predicted that these 'superbugs' will kill more people than cancer and cost the global economy trillions of dollars.

"I think we are underestimating the severe public health risk these antibiotic-resistant bacteria are going to cause," says Dr. Andrew Cameron, assistant professor in the Department of Biology at the University of Regina. "For some pathogens we are in a post-antibiotic era, and routine surgeries such as caesarean sections are going to become dangerous."

Although we have developed procedures for cleaning equipment and washing our hands to help prevent the spread of harmful bacteria, bacterial infections will continue to increase with the loss of effective antibiotics, growing and aging human populations, and eroding environmental quality. "The best mechanism to prevent infection is to block transmission, and to do this we need to identify sources and transmission routes of infectious bacteria," says Cameron.

Dr. Cameron and collaborators, Dr. Jessica Minion and Dr. Meredith Faires from Regina Qu'Appelle Health Region, and Dr. David Alexander and Dr. Ryan McDonald from the Saskatchewan Disease Control Laboratory, were recently awarded a SHRF Collaborative Innovation Development Grant to enhance our understanding of the sources and transmission routes of antibiotic-resistant bacteria.

"I think we are underestimating the severe public health risk these antibiotic-resistant bacteria are going to cause."

This investment will allow the team to evaluate a practical application of genome sequencing and improve our understanding of disease transmission in Saskatchewan. The team's research is targeting the most dangerous and persistent 'superbugs': methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), nontuberculous mycobacteria (NTM) and extended-spectrum β -lactamase containing *E. coli* (ESBL), and how they are spreading in hospitals and in rural and remote communities.

"By identifying the route of transmission such as a specific hospital room or surface within a hospital that is contributing to disease spread, we can quickly inform health care providers to stop the spread of infectious bacteria without the use of antibiotics," says Dr. Cameron. "This is a key step in reducing disease spread in our province."

The one-year grant is a springboard for groups of health researchers and end-users, such as healthcare providers and patients, to foster creativity, novelty and innovation in research that has potential to benefit the health of Saskatchewan residents. Dr. Cameron and his collaborators were one of 24 groups funded in the 2014-15 Collaborative Innovation Development Grant competition. 

ugs! :





Transforming
Métis Health
Services

Together

In 2014, an audit of emergency departments' (EDs) patient charts determined that while First Nations patients with Indian Status could be identified through their status numbers, it was difficult to identify Métis people who were visiting EDs, the number admitted to hospital, their length of stay and the reasons for why they were admitted.

"Without this information it is impossible for us to track Métis patients' use of EDs and their hospital stays," says Dr. Caroline Tait, associate professor in the Department of Psychiatry and Lead of *First Peoples, First Person* Indigenous Mental Health Research Network, Canadian Depression Research and Intervention Network. "This information is critical if we want to see improvements to healthcare services for Métis people."

The creation of a clinical intake tool for self-identification by Métis patients would be a valuable resource for the Saskatoon Health Region (SHR) and the Métis Nation of Saskatchewan (MNS) because it would provide information about the movement of Métis patients through EDs and hospital care. This would allow for a better understanding of the experiences of Métis patients and their families within the SHR, what specific gaps and barriers exist, and create an opportunity for patient-centered research, policy development and changes to health care that privileges the voices of Métis patients and their families. The MNS and the SHR recognize that before a culturally safe clinical tool can be created and applied to patient intake, a formalized agreement about the governance of potential data generated from the use of the tool is required.

As a result, an interdisciplinary team of researchers from the University of Saskatchewan, health representatives from the Métis Nation of Saskatchewan, health and policy managers from the Saskatoon Health Region and a Métis graduate student were recently awarded a SHRF Collaborative Innovation Development Grant to improve research governance, health care policies and patient-oriented care delivered to Métis peoples of Saskatchewan.

"I think our health region is being very progressive," says Dr. Tait, "particularly, Cory Neudorf, Gabe Lafond and Corey Miller. These three people really see that in order to move this project forward we need the involvement of Métis people."

Team:

Dr. Caroline Tait,
Associate Professor,
Department of Psychiatry,
College of Medicine,
University of Saskatchewan

Dr. Cory Neudorf,
Chief Medical Health Officer,
Saskatoon Health Region

**Dr. Peter Butt, Dr. Leah Ferguson and
Dr. Robert Henry,**
University of Saskatchewan

Robert Doucette,
President,
Métis Nation Saskatchewan

Corey Miller,
Vice President – Integrated Health Services
Saskatoon Health Region

Gabe Lafond,
Director Representative
Workforce/First Nation Métis Health Service,
Saskatoon Health Region

Métis people have unique health needs, and an overall gap exists between the health status of Métis people and that of the non-Métis population. The aim of the study is to develop a robust Métis-specific research governance model that can be employed for a range of research partnerships.

"We are drawing attention to the issue in a new way," says Dr. Tait. "Specifically, in terms of how we can use this clinical tool to inform the healthcare system better and ensure that the governance benefits the Métis people."

Health research for Métis people requires strong community input; and better outcomes hinge on the sustained effort and partnership between the researcher, their institution and the community. 

Intergenerational Impacts in Indigenous

HEALTH RESEARCH

Stepping through the door to the Indigenous Peoples' Health Research Centre (IPHRC), you are immediately greeted by the typical cubicle walls, tapping of computer keyboards and shuffling of papers you would find in most offices. But unlike other research centres, a different noise cuts through all the commotion – laughter. And if you listen closer, it's usually been prompted by a little teasing.



"It's not that often a handsome man comes into our office," teases Wendy Whitebear, Research Coordinator at IPHRC, commenting on a friend of the centre's that has just come and gone. "Why thank-you! Thanks," jokes Dustin Brass, one of the centre's three community research associates. Jeanelle Mandes, a research assistant, looks up from her computer screen and laughs.

Scenes such as this one are not uncommon at IPHRC. Since the centre was created in 2002, a spirit of camaraderie has developed amongst those who work there. Most of them knew each other previous to their roles at the centre as teachers and students, or even classmates. Now, it's not only a place where a team of researchers work to improve and strengthen the quality of Indigenous health research, but also a place for learning, growth and Indigenous mentorship.

Currently, IPHRC has a team of three postdoctoral fellows, three community research associates, five research

assistants, a research coordinator, an associate director and a director, along with 30 research affiliates. The mission of the centre is to improve and strengthen the quality of Indigenous health research and the health of Indigenous people. When Dr. Jo-Ann Episkenew was first appointed as director in January 2010, she wanted to build up the profile of the centre so she ventured out to find someone to write a strategic communications plan. She approached one of her

former students, Cassandra Wajuntah, and they started gathering a team and promoting the work of the centre.

"I was just hired as a summer research assistant after my journalism degree to do this plan for Jo-Ann. Then, she hired me on to actually carry out the plan. Eventually, I started taking on more responsibilities and became a research associate and then associate director," Wajuntah says.

Prior to working at IPHRC, Episkenew taught Wajuntah as an undergraduate student in her residential school literature class. Through the six years they have spent working side-by-side, Wajuntah has completed her Master's and is now a PhD candidate studying Indigenous health and public policy. She has grown to have a deep respect for Episkenew.

"She's taught me the importance of preserving relationships and building

capacity in others. She's also a bit of a rock star in the Indigenous research world so it's pretty cool to work so closely with someone with such an impressive track record and reputation," she says. "More importantly though, she's a kind person and I've learned so much from her as a successful Indigenous woman in a workplace where we often encounter barriers."



*Jo-Ann Episkenew,
Director of Indigenous
Peoples' Health Research
Centre*



Episkenew often sums up their relationship by comparing it to another rather famous one. “She is the Spock to my Captain Kirk,” she laughs. “She is uber brilliant and great with details.”

Continuing in this tradition of mentorship, Wajuntah crossed paths with former Indian Communication Arts classmate Jeanelle Mandes and recruited her to the IPHRC team to work as a research assistant helping out with the centre’s communications. Wajuntah thought she would be a perfect fit given her background in both Indigenous studies and journalism.

“She’s a skilled journalist and communicator with a true understanding of the Indigenous health issues we work on,” says Wajuntah. “She’s also an inspiration to work alongside of as a single mother with multiple degrees under her belt. She’s very humble.”

Mandes says working with motivated and educated Aboriginal women at IPHRC is a huge inspiration to her. “I look up to Jo-Ann and Cass because they are both educated and successfully driven women who don’t stop at one educational level but they push themselves to go even further,” she says. “Jo-Ann mentoring Cass and Cass mentoring me, it’s amazing to have those leadership roles to empower one another,” she adds.

And the mentorship doesn’t stop there. IPHRC Research Affiliate, Dr. Linda Goulet, served as a mentor to community research associates Dustin Brass and David Benjoe when she was their teacher as undergraduate students. Over the 10 years Goulet has known them, she has seen them grow as leaders.

“Now that they are both working with us in our research team, they are bringing their perspective of the arts to our research, with their emphasis on the development of the cultural identity of the First Nations students through the arts,” says Goulet.

When David Benjoe joined the team in the summer of 2013, Goulet had recruited him because of his artistic skills and knowledge about Indigenous art programming. He started working at IPHRC with a focus on urban art programming. He considers both Linda and Jo-Ann as mentors in his field of work.

“Jo-Ann is a different kind of person because she’s almost like a kokum or kind of like an aunt but she also understands the academic portion,” he says. “She mentors me when I’m doing my writing or if I’m doing my research and gives me good sources for literature.”

Benjoe recruited Brass and he was brought on to the team to conduct community-based research using the arts to promote health amongst Aboriginal youth as part of the centre’s *Acting Out! But In a Good Way* research project. As part of his role, he is mentoring two of his former students who are now undergraduate students at the University of Regina. Back in high school, Erin Goodpipe was also a participant in *Acting Out!* workshops. Now, Benjamin Ironstand and Erin Goodpipe help facilitate these workshops in First Nations communities as research assistants.

“They were both high school students who I taught. It was then that I saw something unique in those two. They had such independence about Indigenous thought and identity,” says Brass. “It’s very interesting to watch them, especially since I studied under



Group photo at the culture-based tipi camp in 2014.

Jo-Ann. She opened up points of inquiry to me that I'm able to now do for these two."

Goodpipe considers everyone on the IPHRC team as a mentor. "I kind of feel everyone learns off each other. There's a lot of intergenerational stuff going around because Jo-Ann mentored Dustin and now he is mentoring me," says Goodpipe.

As for Ironstand, he has found some new role models. "David Benjoe and Julian Robbins, they're both Indigenous men, they're older than I am and they have education and they've done really great stuff. I've got to talk with them about their theses," he says. "Brass is one of the few teachers I've had throughout my education experience where I saw him as less of an external figure, so that relationship connection was a lot deeper with him," he adds.

Even with all these people in the office, Episkenew's door is rarely closed since the centre embraces a collaborative approach. In fact, the centre is currently governed by a partnership between University of Regina, University of Saskatchewan and First Nations University. Community-based partnerships are also status quo for IPHRC and they are currently working with the File Hills Qu'Appelle Tribal Council and the Lac La Ronge Indian Band using arts-based methods for suicide prevention amongst Aboriginal youth.

Just like the many students she has supervised, Episkenew also had a mentor when she first started at IPHRC. "Dr. Bonnie Jeffery agreed to be my formal 'how to run a research centre' mentor and I will always be grateful to her for the many breakfast meetings we had," says Episkenew. "Her advice was invaluable."

This cycle of intergenerational mentorship has proven effective. Since 2002, the centre has brought in over \$5 million worth of Indigenous health research funding to Saskatchewan and funded over 70 undergraduate students, 30 graduate students and 50 community-based projects. Since the phasing out of centre-based funding in 2013 from the Canadian Institutes of Health Research – Institute of Aboriginal Peoples' Health (CIHR-IAPH), IPHRC now operates on project-based funding from the Saskatchewan Health Research Foundation (SHRF) worth \$750,000 over three years for Iyiniw-Oskâtisak Pamihisowak: Using Indigenous Knowledge for a Healthier Aboriginal Youth and a CIHR operating grant worth \$558,457 over three years for Kitinikêwin Misiwanacihisowin: Researching Arts-Based Wellness Promotion for Suicide Prevention Among Aboriginal Youth.

"Though the funding landscape has changed, we have still been able to grow our team and continue working with Indigenous communities to improve the health of our people," says Episkenew. "I think we're stronger than ever in many ways."

Right now, there are three generations of Indigenous researchers working at IPHRC to advance Indigenous health – proof of the work the centre has done to build capacity over the long-term. Though the team enjoys sharing a laugh, as members of the Indigenous communities they work with, everyone takes their job seriously and feels a personal connection – a calling – to the work.



(Top) The IPHRC team in June 2015.

(Above) Staff visiting at the IPHRC open house and annual report launch in 2015.

"That's the awesome thing. Here, it's all about nurturing and helping other people to be better. Just having those ripple effects. I love coming to work. I love everybody who works here because everybody is working for the greater good of improving the well-being of Indigenous communities," says Episkenew.

After the laughter dies down in the office, the team gets back to work and Brass heads out to conduct a workshop. The tapping of computer keyboards resumes and everyone tucks back into their cubicles. There is meaningful work to be done, and this team is quite happy to do it.

For more information about the Indigenous Peoples' Health Research Centre, please check out their website iphrc.ca or visit them on social media @IPHRCsask or facebook.com/IPHRC.



IPHRC Indigenous Peoples' Health Research Centre

Article and photos contributed by Indigenous Peoples' Health Research Centre.

Improving Breast Health Care in Saskatchewan

According to the Canadian Cancer Society advisory committee on cancer statistics¹, breast cancer is the most commonly diagnosed cancer and the second leading cause of cancer deaths among Canadian women.

Located in Saskatoon City Hospital, the Breast Health Center (BHC) represents a dedicated team of breast surgeons, radiologists, pathologists, plastic surgeons, oncologists, nurses, mammography technologists and sonographers, medical office assistants, social workers and physiotherapists that provides Saskatchewan residents with the best, up to date standard of care in breast health.

During the first two years of operations, the BHC identified some gaps in the way they gather and collect patient information.

“Presently, patient intake information is collected via paper and pencil format, placed in the patient chart and not readily available for patient oriented research,” says Dr. Anne Leis, Professor and Head in the Department of Community Health & Epidemiology at the University of Saskatchewan. “However, other centers in Canada are moving to patient-driven electronic data entry, which could also include collection of patient reported outcomes.”

Without this information it’s difficult to enhance patient care and streamline services, while creating opportunities for ongoing data analysis, and frequent evaluation of services.

In 2014, Dr. Leis and her team were awarded a SHRF Collaborative Innovation Development Grant to undertake the initial steps to

become a rapid learning organization through the evaluation of current data and data collection strategies, and to pilot-test a patient-driven electronic data entry approach. A rapid learning organization is considered a gold standard in health service provision and entails collecting and learning from data, allowing for continuous improvement of care.

“What is exciting for me is the research questions arose from the healthcare system and users of the research,” says Dr. Leis. “It wasn’t just me as a

researcher driving the study, and therefore, we established shared objectives.”

With a system that allows for easily searchable information, the hope is there will be less repetition in reporting from a patient’s perspective and more accurate information that will ensure that the patients are better cared for including those who tend to be marginalized.

“We are all patients, and at some point we will seek care,” says Leanne Smith, Director of Maternal Services, Breast Health Centre and Women’s Health Centre with the Saskatoon Health Region. “By providing this critical information we will be able to serve our patients better, and ultimately, improve patient outcomes.”

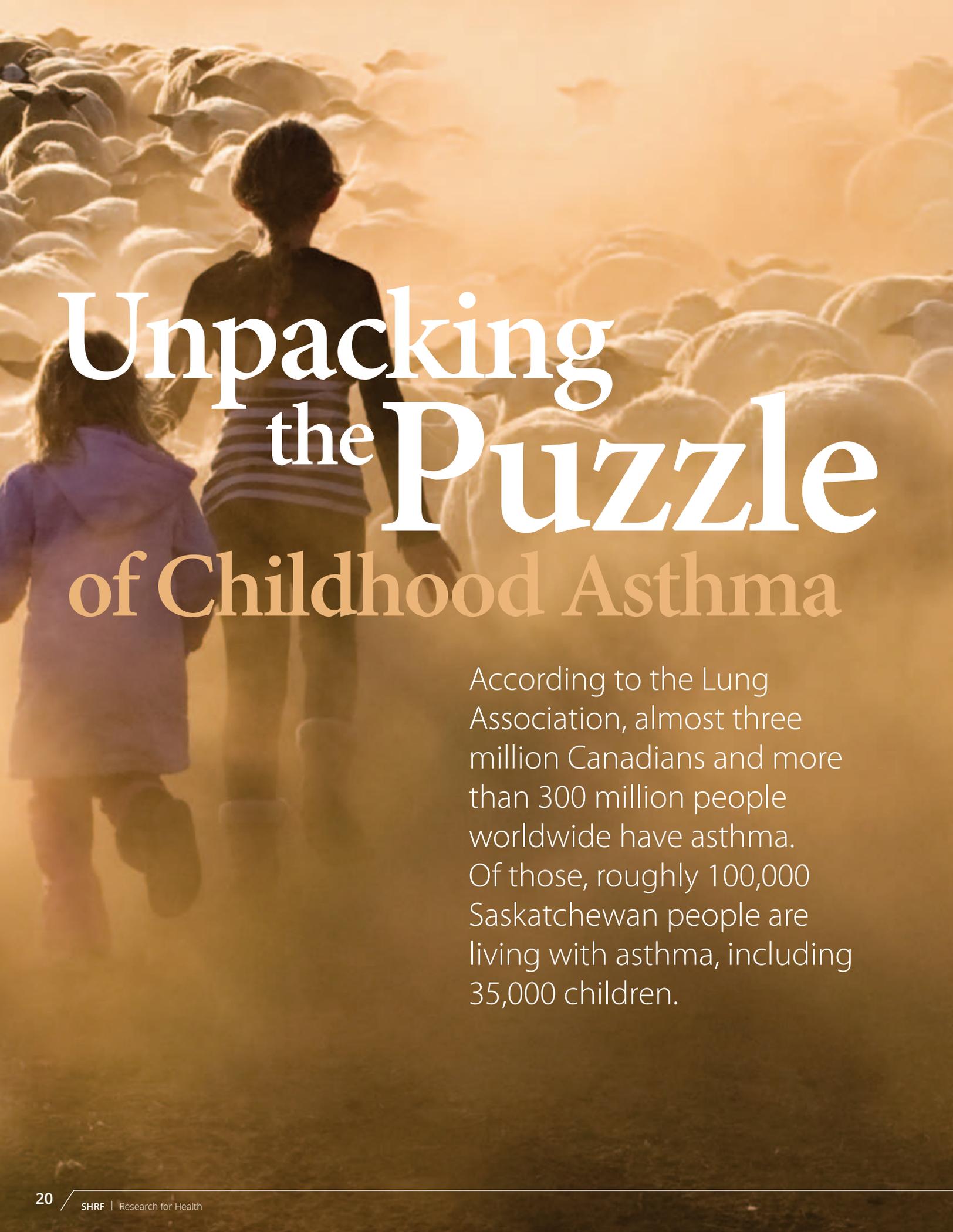
Research findings from this pilot-work will establish a solid basis to study how the BHC becomes a rapid learning organization to strengthen Saskatchewan-based research and make Saskatchewan a leader in breast health. 



¹ Canadian Cancer Society’s Advisory Committee on Cancer Statistics. Canadian Cancer Statistics 2015. Toronto, ON: Canadian Cancer Society; 2015.[May 2015, adapted June 2015]. ISSN 0835-2976



Team: (left to right) Farzana Ali, B. Pharm, MPH, PhD student, Dr. Anne Leis Professor and Head in the Department of Community Health & Epidemiology at the University of Saskatchewan, Leanne Smith Director of Maternal Services, Breast Health Centre and Women's Health Centre with the Saskatoon Health Region, Joan Santoro Program Manager at Breast Health Centre, Dr. Gary Groot Director of Surgical Oncology at the University of Saskatchewan, Ladan Kashaniamin, MPH student and (not pictured) Dr. Pamela Meiers, MD, Fellow of the Royal College of Surgeons of Canada, Christine Meier, RN, patient representative and Kristen Haase, RN, PhD (c).

A person is seen from behind, herding a large flock of sheep in a field during a golden sunset. The scene is bathed in warm, orange light, creating a hazy and atmospheric background. The person is wearing a dark long-sleeved shirt and dark pants. The sheep are densely packed, filling the field and extending into the distance.

Unpacking the Puzzle of Childhood Asthma

According to the Lung Association, almost three million Canadians and more than 300 million people worldwide have asthma. Of those, roughly 100,000 Saskatchewan people are living with asthma, including 35,000 children.

“Even though kids living on farms or in rural areas may be less likely to have asthma compared to those living in urban areas,” says Dr. Lawson, “we still have a problem because, in Saskatchewan, 14% of kids living in rural areas have asthma.”

“Asthma is one of the most common childhood conditions,” says Dr. Joshua Lawson, Epidemiologist at the University of Saskatchewan. “It is estimated between 14 and 21% of kids in Saskatchewan have the disease.”

Several studies have suggested that farming or rural exposures are protective of asthma, the reasons for which are unknown. While one explanation may be the environment, including endotoxin, the same exposures may worsen asthma among those with the condition.

“Given the puzzling nature of the relationship between some environmental exposures and asthma,” says Dr. Lawson, “it is important to investigate exposures other than endotoxin in order to help us understand the cause of the disease and identify agents which may trigger episodes.” Endotoxin is found in household dust and is ubiquitous in the indoor environment.

In 2014, Dr. Lawson and his team, Dr. George Katselis, Dr. Donna Rennie and Dr. Shelley Kirychuk from the Canadian Centre for Health and Safety in Agriculture (CCHSA) at the University of Saskatchewan, were awarded a SHRF Collaborative Innovation Development Grant to investigate two new lines of inquiry which include the identification of constituents in dust and quantify their relationship with asthma and asthma related outcomes, and the assessment of personal monitoring as a way of collecting dust samples.

“Typically, studies rely on settled dust from carpets and mattresses to assess the role of endotoxin and childhood asthma,” says Dr. Lawson. “But the difficulty with that is it may not account for the child’s true exposure which can include other home or outdoor environments such as the farming environment and where children may be playing.”

To obtain more accurate information, the team is looking at piloting the use of a backpack that will be worn by children for one week. The air intake will sit at head level to better monitor the ambient air. This novel approach will give the researchers a better perspective of what the children are actually breathing and what they are exposed to as opposed to what is collected in settled dust.

The research program will be a pilot study based on a recent cross-sectional survey of approximately 3,400 Grade 1 to 8 children in Saskatchewan who lived along an urban-rural gradient including children living in Regina, Prince Albert, and the rural area around Prince Albert.

“Even though kids living on farms or in rural areas may be less likely to have asthma compared to those living in urban areas,” says Dr. Lawson, “we still have a problem because, in Saskatchewan, 14% of kids living in rural areas have asthma.”

These new ways of study will be used to further explore rural and farming exposures in relation to childhood asthma. Dr. Lawson and his team are one of three Collaborative Innovation Development Grants that are co-funded by the Lung Association of Saskatchewan, a new partnership formed with SHRF to support asthma research in the province. 



As Many as 1 in 5 Canadian Children Have Asthma!

If you know a child with asthma, it is important to learn how to manage this common yet serious disease.

The Lung Association is your go-to resource for asthma information and education.

asthma.sk.lung.ca THE  LUNG ASSOCIATION™
Saskatchewan

The Agricultural Health and Safety Network

The Agricultural Health and Safety Network (the Network) is the cornerstone of the Canadian Centre for Health and Safety in Agriculture's (CCHSA) Knowledge Translation Program.

As the Network enters its third decade it welcomes the challenge of a changing agricultural world including new technology, different family farming structures, and new industry players.

Reporting ground breaking research from CCHSA to rural Saskatchewan is a primary goal for the Network. Long term health and injury studies, as well as new and innovative research demonstrate CCHSA's dedication to rural people.

At the heart of the Network is the desire to care about farm families and their future in a changing agricultural scene and sometimes very difficult times.

The Long Term Health & Safety Initiatives of CCHSA

Respiratory and Hearing Initiatives

Research at CCHSA found that farmers' respiratory health and auditory health was conclusively affected by farming exposures. Hearing and respiratory clinics are held all over the province. These health initiatives also include health clinics, factsheets, resources, workshops and DVDs.

Provincial Farm Stress Initiative

In 1999 the Centre for Agricultural Medicine and the Farm Stress Unit organized a meeting to address farm stress and its impact on farm families and rural communities. It was agreed that debt, long hours of work on the farm and off-farm jobs, powerlessness over commodity prices and government policy were to blame for high stress levels. The Network proceeded to develop a Stress on the Farm Initiative including *The Sleepless in Saskatchewan* tour and DVD, and *The Difficult Times: Stress on the Farm* resource.

Injury Initiatives

In 2000 Dr. Jim Dosman said: "We have made good progress in reducing agricultural lung disease. Now we need to tackle agricultural injuries. That is the problem that causes the greatest loss of potential years of life in our farmers."

The Saskatchewan Farm Injury Project began in 2007 using a large cohort study to ask farmers about themselves, their families and their farm operations. The purpose was to understand risk factors associated with agricultural injury, with the long-term goal of informing the development of prevention programs.

DID YOU KNOW?

Facts

Saskatchewan Farm Injury Facts

- Fatal and hospitalized farm injuries occur at all ages and in both sexes.
- Tractor rollovers and run overs are the most common cause of fatal injury.
- The majority of children killed on farms are the children who live there, not visitors.
- The rate of fatal injury among male farmers aged 60 and older is three times higher than expected, based on their numbers in the farm population.

What does the Network have to offer your community?

The Network was founded with the mission "to improve health and safety on the farm through education, service and evaluation research." The goal is to reduce injury and illness related to the farm environment through cooperative efforts with our partners.

Since its inception, the Network has grown with Saskatchewan farm families in effort to keep up with their health and safety information needs.





Respiratory Clinics

Network members are eligible for an educational and respiratory screening service provided by the Network and their rural municipality. A registered nurse works with farmers and their families in their local community to increase awareness of health and safety risks associated with respiratory hazards on the farm, develop methods to reduce their exposure and show how they and their family physician can monitor the effects such hazards have on their respiratory health.

Hearing Clinics

Network members are eligible for an educational and hearing screening service provided by the Network and their rural municipality. Trained staff work with farmers and their families in their local community to increase awareness of noise hazards on the farm, develop methods to reduce their exposure to harmful noise and show how they and their physician can monitor the effects of hazardous noise on their hearing.

Health and Safety Workshops

A variety of workshops are available to members of the Network including: Farm Safety Plans, Aging Farmers, Women on the Farm, Stress and Agriculture, Making Sleep Work for You, Caring for the Rural Caregiver, and Respiratory Safety.

Printed Resources

The Network is continually developing new resources for farm families including booklets, newsletters, factsheets, and DVDs. These are developed out of need expressed by Saskatchewan farm families and current research. There are also workshop packages available for anyone who would be interested in presenting in their own community or organization. The Network sends out a periodic educational package including a current farm safety theme.

Website and Social Media

A movement towards electronically based resources continues. The Network is working towards servicing the progressive and technologically savvy farmers by keeping our website up to date and uploading current and new resources and videos as well as providing the option to stay connected via Facebook and Twitter.

Other current and ongoing research projects at CCHSA include the following:

- Rural and Remote Dementia Care
- Mass Spectrometry-based Agricultural, Environmental and Clinical Medicine Studies
- The Saskatchewan Farm Injury Project – Phase 2
- The Saskatchewan Rural Health Study
- The Saskatchewan Farm Injury Surveillance Program
- Airways Research Project
- Saskatchewan Farmers Back Study
- New Swine Workers Respiratory Health Study
- The Role of Inflammation in the Respiratory Health of Swine Workers
- A Needs Assessment of HIV/AIDS Co-programming in Saskatchewan
- Barn Dust Exposure and Lung Inflammation in Animals and Workers

For more information on the above projects, please see the CCHSA website:
cchsa-ccssma.usask.ca

To book a service or get more information please contact the Network:

Phone: (306) 966-6644

Email: agsafety@usask.ca

Like us on Facebook:

facebook.com/AgricultureHealthSafetyNetwork



CCHSA / CCSSMA



UNIVERSITY OF SASKATCHEWAN



Article and photos submitted by Canadian Centre for Health and Safety in Agriculture.

Recipes



Easy Pot Roast

Ingredients

- 2 pound boneless beef chuck or rump roast
- 2 tablespoons vegetable oil
- 1/2 cup onion, chopped
- 3 garlic cloves, minced
- 1 cup rutabagas (turnip)
- 1 teaspoon dried thyme
- 1 teaspoon dried oregano
- 2 cups water
- 3 tablespoons cornstarch
- 3 tablespoons water, very cold
- 1/2 cup carrots, sliced

Directions

Brown meat on all sides in the oil.

Add onions, cover and cook on low heat for 15 minutes.

Add garlic, rutabagas, herb seasoning and 2 cups of water.

Cover tightly and simmer 3 1/2 to 4 hours, until the meat is tender.

Thirty minutes before the pot roast is ready, mix the cornstarch and cold water in a small bowl.

Add 1/2 cup of hot liquid from the pot to the cornstarch mixture to form a slurry.

Then add the mixture back into the pot and stir.

Add the carrots and cook for an additional 30 minutes.

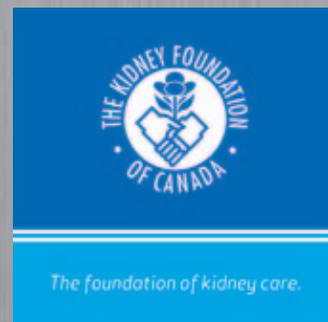
Renal Diet Nutrient Analysis

- Servings per recipe: 10
- Serving size: 3 ounces of beef

Nutrient Analysis

- Calories: 310
- Protein: 27g
- Carbohydrates: 5g
- Fibre: 1g
- Total Fat: 20g
- Sodium: 62mg
- Phosphorus: 229mg
- Potassium: 318mg

Renal and Diabetic Exchanges: 3 protein



For more recipes and tips for eating a renal friendly diet, please visit:

kidneycommunitykitchen.ca

Reprinted at kidneycommunitykitchen.ca with permission from American Association of Kidney Patients

Blueberry-Coconut Baked Steel Cut Oatmeal

Recipe from Ekweskeet Healing Lodge, SK

Oatmeal Ingredients:

- 1 1/2 cups steel cut Irish oats
- 1/2 tsp ground ginger
- 1/2 tsp fine sea salt
- 1 tsp baking powder
- 4 cups unsweetened vanilla almond milk
- 2 cups light unsweetened coconut milk
- 1 1/2 cups fresh or frozen blueberries
- 1/4 cup unsweetened dried blueberries
- 1/2 cup unsweetened coconut flakes
- vanilla stevia drops or your favourite natural sweetener to taste

Oatmeal Directions:

Preheat oven to 350°F. Lightly coat a 9x13" baking dish with cooking spray. Combine all ingredients in large bowl, adding blueberries and coconut last. Sweeten to taste. Bake for about one hour. The oatmeal will not appear done when you take it out of the oven. Remove from the oven and let it cool to room temperature. Then put it in your refrigerator to thicken overnight for best results.

Blueberry Sauce Directions:

Heat the blueberries with a splash of water over medium high heat. When you hear them sizzle, reduce heat to medium and cook for about 5 minutes until saucy. Mash the blueberries against the side of the pot with a spatula. Serve oatmeal with some almond or coconut milk, blueberry sauce, and optional toppings.

Prep Time: 5 minutes

Cook Time: 60 minutes

Yield: 8-10 servings

Blueberry Sauce Ingredients

- 2 cups fresh or frozen blueberries

Optional Toppings

- toasted nuts
- coconut flakes
- whipped cream
- extra dried or fresh blueberries



Strawberry Juice

Recipe from our CIHR Project Team!

Ingredients:

- 2 cups strawberries (about 18-20)
- 1 tsp. lemon juice
- 2 Tbsp. sugar (or substitute)
- 2 cups cold water

Directions:

Wash the strawberries and remove the stems. Chop the strawberries into small pieces. Blend with the lemon juice and sugar or sugar substitute until it is a smooth puree. Then add water and blend again. Pour into glasses and serve immediately.

Honouring Our Strengths

Indigenous Culture as Intervention in Addictions Treatment

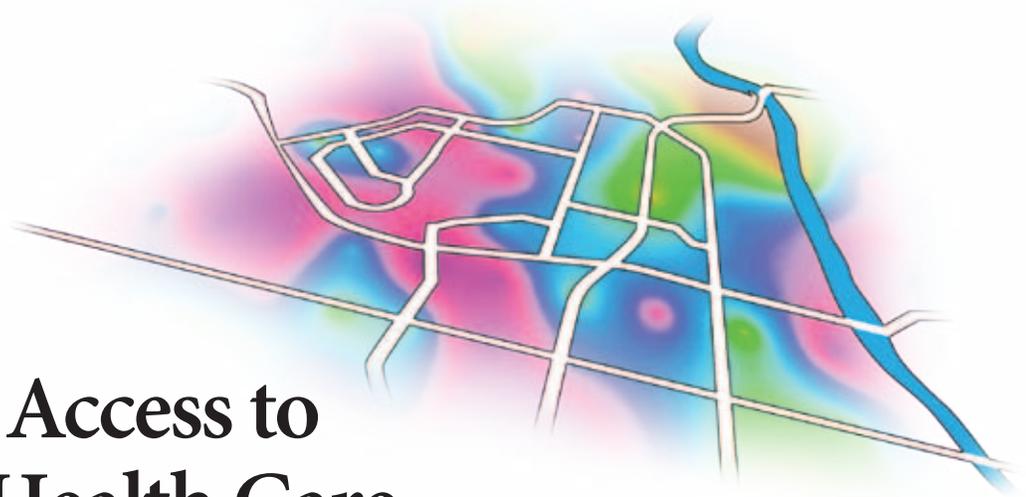
The aim of this project is to evaluate the effectiveness of First Nations culture as a health intervention in alcohol and drug treatment. This ad features recipes from coast to coast and is a reminder that food is essential to the healing process. **Visit our website to collect all 12 recipes!**



CIHR IRSC
Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

www.tinyurl.com/cultureasinterventionresearch

Funded by the Canadian Institutes of Health Research



Mapping Access to Primary Health Care

Did you know that the city or neighbourhood you live in can impact your access to primary health care such as family physicians, nurse practitioners and physiotherapists?

In Canada, there is a growing concern that the primary health care system is not as responsive as it could be in certain geographic areas with some communities not having the same access to a range of primary health care professionals. For example, physician to population ratio in Winnipeg is 0.8 per 1,000 people while Victoria is 1.5 per 1,000 people.

doesn't always result in the best level of care provided. Ultimately, these differences in access to health services have negative consequences for best meeting the health needs of all Canadians.

Access to primary health care services is a considerable health delivery concern across Canada having important health policy implications yet relatively unstudied in the context of local geographic scales.

Dr. Shah was recently awarded a Research Fellowship Grant from SHRF to investigate the availability and geographic accessibility to family doctors, nurse practitioners and physiotherapists in all three Prairie provinces (i.e., Manitoba, Saskatchewan, and Alberta). His background is in human geography and quantitative social research with an interest in analyzing geographical access to health care services and to food sources, locating health services and facilities mapping. Dr. Shah's postdoctoral fellowship is under the supervision of Dr. Stephan Milosavljevic and Dr. Brenna Bath in the School of Physical Therapy, College of Medicine at the University of Saskatchewan.

"It is important to know what the actual gaps are compared to the population health care needs," says Dr. Shah. "We need to identify the under-served or poorly served communities, and where they are geographically."

By mapping service delivery at both health region and municipality levels, Dr. Shah will be able to identify the accessibility of primary health care compared to other neighbouring provinces and in rural and remote areas. The results in Saskatchewan will be compared with Alberta and Manitoba to see whether there is variation across provinces based on different provincial health policies. The results of this study will identify primary health care patterns and any under-served or poorly served populations in the Prairie provinces. It will assist health care managers and policy makers to understand the distribution of existing key primary health care personnel resources.

By noting differences in geographic accessibility to health services, this study will suggest several courses of action to help strengthen primary health care in Saskatchewan and better meet the health needs of everyone, regardless of where they live. 



Dr. Tayyab Shah (right) researcher at the University of Saskatchewan, and supervisors Dr. Stephan Milosavljevic (middle) and Dr. Brenna Bath (left) in the School of Physical Therapy, College of Medicine at the University of Saskatchewan

"Being in Victoria you have a certain advantage," says Dr. Tayyab Shah, researcher at the University of Saskatchewan. "You have double availability as compared to Winnipeg."

Variances in access and availability are also apparent depending on the neighbourhood in which you live. In some cases, people who can't find a family doctor in close proximity to their neighbourhood will rely on walk-in clinics and emergency rooms more often than their family physicians. This limits the continuity of care given to people, which



The Canadian Light Source:

Light

SAVING LIVES

The Canadian Light Source (CLS) is the brightest light in Canada—millions of times brighter than even the sun—used by scientists to get incredibly detailed information about the structural and chemical properties of materials at the molecular level, with work ranging from mine tailing remediation to cancer research and cutting-edge materials development. With the University of Saskatchewan medical school and the Royal University Hospital within walking distance, the synchrotron is a natural home for collaboration between leading health scientists. To celebrate 10 years of synchrotron health research, we've taken a few of the most exciting examples of synchrotron health research and mapped them in the infographic.

From Dr. David Cooper's bone growth imaging to Dr. Bogdan Popescu's work on multiple sclerosis, innumerable synchrotron research projects rely on Saskatchewan Health Research Foundation support for their success. Funding from SHRF has helped hone imaging techniques for future synchrotron users, better understand the progression of stroke, and image and treat prostate cancer.

Article and infographic submitted by
Canadian Light Source

Saving Lives With Light

Made progress to
detrimental

Developed drug carriers to deliver ibuprofen to the site of injury
DOI: 10.1039/C3CP50699A



Revealed how organic mercury can interfere with vision
DOI: 10.1021/cb4004805



Discovered link between airway liquid secretion and bacteria in Cystic Fibrosis
DOI: 10.1073/pnas.1406414111



Explored the human microbiome for better nutrition and health
DOI: 10.1038/nature13995

Developed innovative way to use nanosilver to combat bacterial infections
DOI: 10.1021/acs.langmuir.5b00049

Used synchrotron techniques to image and treat prostate cancer
DOI: 10.1016/j.jmb.2009.10.013



Studied more sensitive techniques for early arthritis detection
DOI: 10.1016/j.jocx.2015.02.469



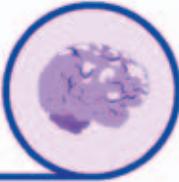
Created technique to track bone growth in 3D at a cellular level
DOI: 10.1002/jor.22937



Investigated historical health problems using bones from 1800
DOI: 10.1016/j.jas.2012.01.041 DOI: 10.1016/j.jas.2015.03.006

To learn more about any of these stories, visit the Canadian Light Source website: lightsource.ca

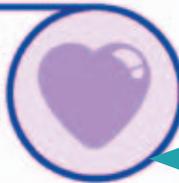
Towards blocking the aftermath of strokes
DOI: 10.1021/cn4000346



Imaged embryonic teeth to prevent problems later in life
DOI: 10.1002/ar.22845



Produced protein to convert blood to a universal blood type
DOI: 10.1371/journal.pone.0111137



Developed method to track chemical changes in breast cancer before it grows
DOI: 10.1021/cb4004805

DOI: 10.1021/cb4004805

Uncovered infection mechanism of toxoplasmosis during pregnancy
DOI: 10.1021/jm7010673



Developed better cryogenic techniques to preserve genetic diversity
DOI: 10.1371/journal.pone.0114801

DOI: 10.1371/journal.pone.0114801

Illuminated skin health and mineral distribution at every sublevel
DOI: 10.1016/j.apradiso.2013.02.019

DOI: 10.1016/j.apradiso.2013.02.019



Blocked common staphylococcus bacteria to fight hospital-acquired infections
DOI: 10.1021/cb2003576

DOI: 10.1021/cb2003576



Investigated cell structures to develop novel antibiotics
DOI: 10.1016/j.jmb.2009.10.013

DOI: 10.1016/j.jmb.2009.10.013



TRACKING BREAST CANCER BEFORE IT GROWS

Researchers from the University of Saskatchewan are developing new methods to screen for and effectively treat cancer at its earliest stages. Using infrared light in place of conventional screening techniques enables scientists to identify changes in chemical signatures well before any physical changes occur. Infrared imaging could not only make it possible to screen for cancer in its infancy, but to predict possible drug treatment response on a patient-by-patient basis. Because of the extreme brightness of synchrotron light, the technique makes it possible to map chemical information across thousands or millions of cells without altering the body's cells in any way, minimizing additional health effects.

TACKLING TRANSFUSION WITH A UNIVERSAL BLOOD TYPE

Researchers have developed a technique to turn nearly any blood into a universal type resembling O-type blood, a development which could transform blood transfusion and human health. University of British Columbia scientists used a technique called directed evolution along with synchrotron-based structural imaging to develop an enzyme that removes A and B type antigens from blood. The resulting red blood cells, without antigens, are very similar to the O-type blood cells, which are the only blood types that can be transfused into anyone without adverse reactions.

NANOSILVER AND THE FUTURE OF ANTIBIOTICS

The antibacterial properties of silver have been known for thousands of years, but scientists are still not exactly sure what it is about silver and other precious metals that make them such an effective combatant of bacteria at the nanoscale level. Using the SXRMB beamline at the CLS, researchers from Dalhousie University are trying to determine the best way to deliver nanosilver compounds as a potential antibiotic. This could be a solution to fighting the ever-growing antibiotic resistance of many bacterial diseases.



Canadian Light Source | Centre canadien de rayonnement synchrotron

TEN YEARS OF DISCOVERY

Infectious Disease: Hepatitis C Virus

Hepatitis C virus (HCV) infection is a global health concern. According to the World Health Organization (WHO) 130 to 150 million people globally have chronic hepatitis C infection. A significant number of those who are chronically infected will develop liver cirrhosis or liver cancer with approximately 500,000 people dying each year from hepatitis C-related liver diseases.

Hepatitis C is a blood borne virus and the most common modes of infection are through unsafe injection practices; inadequate sterilization of medical equipment; and the transfusion of unscreened blood and blood products. Presently, there is no vaccine for hepatitis C. Thus, identification of novel targets for development of antiviral drugs is an ongoing goal of HCV research.



Dr. Yalena Amador Cañizares, postdoctoral fellow in the College of Medicine at the University of Saskatchewan

In 2011, an estimated 0.6% to 0.7% (i.e., 220,697 to 245,987 Canadians) of the total Canadian population was living with chronic hepatitis C, and roughly 44% of them were unaware of their status (i.e., 97,107 to 108,234 Canadians).

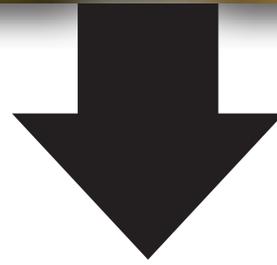
"Saskatchewan has a high incidence of HCV infection relative to the Canadian average," says Dr. Yalena Amador Cañizares, postdoctoral fellow in the College of Medicine at the University of Saskatchewan. "These high rates make HCV infection a priority health issue that affects Saskatchewan residents."

Born and raised in Cuba, Dr. Amador Cañizares completed her undergraduate and graduate studies at the University of Havana before starting her postdoctoral training under the supervision of Dr. Joyce Wilson at the University of Saskatchewan. In 2014, Dr. Amador Cañizares received a Postdoctoral Fellowship Grant from SHRF to explore the mechanism by which miR-122, a cellular molecule, promotes HCV replication, and identify novel antiviral targets.

"In recent years, the standard of care has changed rapidly and promising new antiviral drugs are being developed to treat the most common strain of the virus," says Dr. Amador Cañizares. "However, the ability of HCV to rapidly evolve in the setting of drug pressure and resistance is a possible threat to the success of these new therapies in the long term."

Additionally, due to the high cost of these therapies they are not being provided to all infected patients, and it is not something foreseeable in the near future. There is also a need for the development of alternative treatment options for patients with less common strains of the virus and patients with a condition or factor that could harm their health if given the current therapies.

The research findings will hopefully unravel the secrets behind the complexities of HCV infection and provide the insight required to develop new ways to inhibit the virus and treat HCV infected patients. 



Did you know that in Saskatchewan our rates for Hepatitis C are 50% higher than the Canadian national average?

Exposure can happen through blood to blood contact – anyone who received a blood transfusion prior to 1992 in Canada or in a country that does not have screening procedures should be tested.

Hep C has minimal symptoms – this is why everyone should be tested. If untreated Hep C can lead to severe liver damage, and even Cirrhosis.

There is a cure! Treatment for Hep C is getting easier, with new medications that have shorter treatment times and less side effects.

AIDS Saskatoon provides support for people living with or going through treatment for Hep C.



1143 Ave F N., Saskatoon, SK
Phone: 306.242.5005 Fax: 306.665.9976
www.aidssaskatoon.ca

Up until a couple of years ago, a non-descript building nestled in a back corner of the University of Saskatchewan campus didn't receive a lot of notice. It didn't even have one of the university's green signs out front.

Cyclotron:

SASKATCHEWAN'S NUCLEAR MEDICINE FUTURE



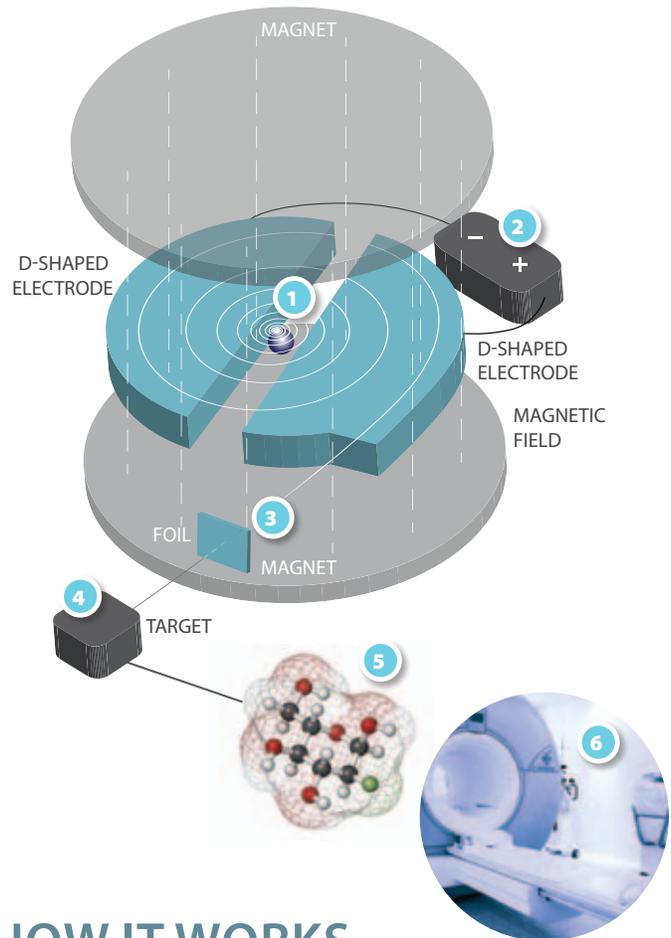
The cyclotron and beamline at the Saskatchewan Centre for Cyclotron Sciences.

What a difference a couple of years make.

Today, the building sports a large square addition, crowned with ventilation stacks and sports a new sign: 'The Saskatchewan Centre for Cyclotron Sciences.' And rather than being a backwater, the building is a home to a cyclotron and supporting nuclear laboratories with the potential to revolutionize medicine and biology in areas ranging from the diagnosis and treatment of cancer and conditions like Parkinson's disease, to developing new varieties of crops to feed the world.

"The Saskatchewan Centre for Cyclotron Sciences is a new tool for Saskatchewan's health research community. It opens up a whole array of research opportunities that haven't been in the province before, along with supplying radiopharmaceuticals to Royal University Hospital," said Neil Alexander, Executive Director of the Sylvia Fedoruk Canadian Centre for Nuclear Innovation. The Fedoruk Centre - named after nuclear medicine pioneer and former Saskatchewan lieutenant-governor Sylvia Fedoruk - manages and operates the \$25-million facility on behalf of the University of Saskatchewan.





A cyclotron is a device that hits target materials with a beam of subatomic particles called protons. When the beam hits atoms in the target, nuclear reactions change the atoms' structure creating a radioisotope – unstable atoms that give off radiation as they decay to become more stable atoms. The radioisotope is then added to a chemical to create a radioactive drug that is used in medical imaging.

For example, current clinical PET-CT scans use a sugar tagged with a radioisotope. When the sugar is injected into a patient it is rapidly taken up by cells that are the hungriest for fuel such as those in tumors. Once the sugar is inside the cells the radioisotope decays, releasing energy that is detected by the PET-CT machine, allowing doctors to see where cancerous cells are. This information is crucial for identifying active tumors and can also show how well a patient is responding to chemotherapy.

"An MRI provides information about anatomy, but molecular imaging with a PET-CT scanner lets you see function – where the most active cells are, or where a particular biological process is happening," explained Humphrey Fonge, a radiopharmacist with the Saskatoon Health Region and clinical assistant professor with the Department of Medical Imaging at the University of Saskatchewan.

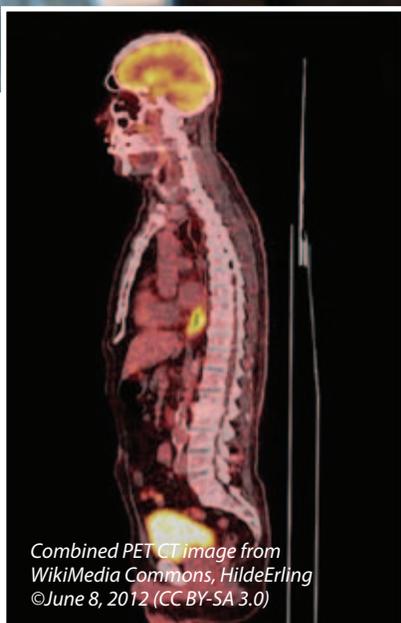
"Many diseases, particularly cancers, have irregular or defective processes at the cellular level. With molecular imaging and nuclear medicine we can target those specific processes and see what is going on," he added.

HOW IT WORKS

- 1 A stream of negatively-charged hydrogen ions (atoms with one proton and two electrons) are injected into a vacuum chamber between two D-shaped plates – called 'dees' – enclosed between the poles of an electromagnet.
- 2 An alternating positive and negative charge between the dees moves the ion back and forth from one dee to the other. The ion accelerates every time it crosses the gap between the dees, gaining energy. The magnetic field holds the ion within the horizontal plane, resulting in the accelerating ions moving in a spiral path out towards the edge of the dees.
- 3 At the edge of the dee, the ions pass through a graphite foil that strips away the electrons, leaving a beam of high energy protons that are steered down a beamline to a target. Target materials can be liquids, solids or gases, depending on the radioisotope being made.
- 4 When a high energy proton from the cyclotron collides with an atom in the target, other sub-atomic particles are knocked out of the target atom's nucleus converting the atom into a radioisotope.
- 5 The radioisotope is separated from the target material in the facility's production laboratory. The radioisotope is tagged on to a molecule such as a sugar, creating a radiopharmaceutical. The completed drug is then shipped to a hospital or used in research.
- 6 In the hospital nuclear medicine department, the radiopharmaceutical is injected into a patient who is then placed in a PET-CT scanner. As the radioisotope in the radiopharmaceutical decays, it releases energy that is detected by the scanner which generates an image that is used by doctors to diagnose diseases such as cancer.



Below: Dr. Humphrey Fonge, radiopharmacist with the Saskatoon Health Region and clinical assistant professor in the Department of Medical Imaging at the University of Saskatchewan, Dr. Ron Greyer, professor in the College of Medicine at the University of Saskatchewan



Combined PET CT image from Wikimedia Commons, HildeErling ©June 8, 2012 (CC BY-SA 3.0)

Above: Neil Alexander, Executive Director of the Sylvia Fedoruk Canadian Centre for Nuclear Innovation

“We’re developing a platform that doesn’t exist anywhere else in Canada to develop new imaging agents using antibodies and take them all the way through clinical trials.”

Fonge and colleague Professor Ron Geyer with the U of S College of Medicine are part of a growing group of Saskatchewan-based researchers working on developing new molecular imaging agents, molecules labelled with radioisotopes that can be used to study, diagnose and someday treat diseases by exploiting an illness’ unique biochemical pathways.

The Fedoruk Centre has supported the team’s research, using antibodies labelled with a radioisotope to identify breast cancers that are resistant to commonly used chemotherapy drugs. Being able to spot aggressive, drug-resistant forms of cancer early is important as it means that a physician can switch a patient on to other drug treatments. In future, the team hopes that the same molecule could be attached to a different radioisotope that could deliver a radiation dose directly to a cancer cell to kill it while sparing nearby healthy cells, rather than simply light it up to a PET-CT scan.

A related initiative led by Geyer called the Centre for Biologic Imaging Research and Development – or C-BIRD – recently received over \$2 million from the Federal Government to develop new molecular imaging probes to target a number of diseases, particularly breast cancer and lymphomas. C-BIRD will take advantage of the fact that, with the cyclotron, the U of S now has everything

needed to make new radiopharmaceuticals and imaging probes, from the cyclotron, to labs, to imaging equipment and a research hospital.

“We’re developing a platform that doesn’t exist anywhere else in Canada to develop new imaging agents using antibodies and take them all the way through clinical trials,” said Geyer. “We have a group with expertise in developing the antibodies, expertise in attaching radioisotopes to those molecules, imaging capabilities, a cyclotron that can produce all sorts of radioisotopes, and expertise in medicine and veterinary medicine to take these from ideas to clinical trials.”

“Other places have some of those things and some of that expertise, but we’re going to have all of them. We could become one of the best centres for molecular imaging and nuclear medicine in Canada. And that’s going to benefit patient care.”



Article and photos contributed by Sylvia Fedoruk Canadian Centre for Nuclear Innovation.



UNIVERSITY OF SASKATCHEWAN
College of Medicine
MEDICINE.USASK.CA

We are proud to be a partner in recognizing research excellence in Saskatchewan.

Congratulations to all 2015 SHRF grant and award recipients.

Your work truly changes lives throughout Saskatchewan and around the world.

Adolescent Exercise for

Bone Health

Osteoporosis is a major public health concern later on in life. The interesting thing about our bones is the only time you can increase the amount of bone in your skeleton is during the growing years. Once you hit your early 20s all you can do is delay the rate at which you lose your bone density. However, there is a theory that if you can increase your peak bone mass (i.e., the amount of bone that you have at the end of your growth period) you can potentially reduce the risk of bone fragility and related fracture later in life.

It has been known for a long time that elite level gymnasts have really good bone density, but we can't expect everyone to participate 20 hours a week in elite sports.

"During my PhD I studied recreational gymnastic participants and found that with one to two hours a week children have better bone strength, especially at the forearm," says Dr. Marta Erlandson, assistant professor in the College of Kinesiology at the University of Saskatchewan. "This finding is a big advantage, because the upper limb is the most common site of fracture in childhood, with roughly 65% of all fractures being at the wrist."

While we know physical activity during the growing years has a beneficial impact on bone development with the most active children laying down more bone compared to less active peers, we aren't sure which type of exercise is most beneficial.

"The type of exercise required to bring about the greatest benefits for bone development remains unknown," says Dr. Erlandson. "Most physical activity intervention programs have focused on lower limbs, paying little attention to upper limb exercises."

In 2015, Dr. Erlandson was awarded a SHRF Establishment Grant to investigate the effect of a school-based physical activity intervention that challenges the upper and lower limbs on bone development for both short- and long-term health benefits.

"Since we've shown that one to two hours of recreational level skills per week has a positive impact on bone health," says Dr. Erlandson, "we want to take that model into the school and work with teachers so that they understand these gymnastic type activities and how it can have a long term impact on the bone health of these kids."

**ACCORDING TO OSTEOPOROSIS CANADA,
OSTEOPOROSIS HAS BEEN CALLED A
PAEDIATRIC DISEASE WITH GERIATRIC
CONSEQUENCES.**

osteoporosis.ca



DID YOU KNOW?

Tips

Dr. Marta Erlandson, assistant professor in the College of Kinesiology at the University of Saskatchewan

Dr. Erlandson is working in partnership with the Saskatoon Public School Board to conduct this study. Two schools in Saskatoon have been purposefully sampled to have similar demographics, programming and social supports and have confirmed interest. Children in Grades 6 through 8 at School 1 will receive an eight-month weight-bearing physical activity intervention, while those at School 2 will receive conventional physical education programming.

"I will measure the children's bone density and structure before and after the intervention," says Dr. Erlandson, "as well as, one and two years later to see if these benefits are being maintained."

Randomization is being done by school so that one school receives the intervention and the other receives regular classes to minimize the potential that children receiving the intervention will influence children receiving the regular programming.

It is important to look at the younger ages, because this will provide the knowledge necessary to identify whether physical activity and diet can increase people's bone health. Additionally, the research findings can inform us whether specific exercises will prevent fractures or postpone the age at which people are starting to have deterioration of bone health later in life.

"We are looking at primary prevention in trying to decrease the burden on our health care system later in life," says Dr. Erlandson. "But bone is unique and we really can't do that in the 50s and 60s when the low bone mass shows up."

Physical activity is just so important for the natural growth process and to develop the healthiest systems possible. This study will provide a first step in identifying the type of physical activity interventions with the greatest long-term bone health benefits. It will provide new knowledge related to determinants of health status, one of our provincial health priorities. 

Tips on how to get your young children to move more:

-  Make physical activity a fun, regular part of every day
-  Make physical activity one of the selection criteria for your child's preschool or day care
-  Be a good role model
-  Set limits on screen time
-  Encourage your kids to join a sports team or club



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Making Connections, Effecting Change

For more than 15 years, the Saskatchewan Population Health and Evaluation Research Unit (SPHERU) has brought together a team of researchers to study the social determinants of health – factors outside the traditional notions of health, such as culture, education and income that affect people’s health – and look at ways to reduce inequities among populations.

It has built a national profile and is known as one of a small number of research units in Canada advancing population health research that will have an impact on jurisdictions both closer to and far removed from Saskatchewan. At present, it includes 13 researchers, one research associate and two postdoctoral fellows, as well as numerous project and administrative staff members. The research typically falls within the following areas: Northern and Aboriginal Health; Healthy Children; Rural Health; History of Health Inequities; and Intervention Research.

“SPHERU was launched in 1999 with an interdisciplinary group of researchers interested in population health disparities, committed to bringing their diverse perspectives together, as well as that of community and stakeholder partners, to produce new policy and program relevant knowledge for addressing inequitable health determining conditions and outcomes,” says Sylvia Abonyi, SPHERU Acting Director. “Over the years our complement of researchers has changed but as a group we remain committed to our core mission, to the fundamental importance of a community-engaged approach, and the belief that the contribution we can make as a team is far greater than the sum of individuals that make it up.”

Connecting for Research

For SPHERU, connections are crucial, and enhanced by its presence at two universities (Saskatchewan and Regina) and across three locations (Saskatoon, Regina, and Prince Albert). The unit draws from a range of disciplines, such as epidemiology, social work, geography, political science, anthropology, kinesiology, and nutrition, creating a space for interaction and dialogue for which there are few opportunities across colleges and campuses. For example, Dr. James Daschuk of the University



“The work that SPHERU researchers are doing with us has provided a foundation for us to develop interventions that are meaningful to the lives of seniors in our rural communities.”

EDITED BY
Bonnie Jeffery
Isobel M. Findlay
Diane Martz
and Louise Clarke

of Regina, an historian with a background in anthropology, released his book, *Clearing The Plains* in 2013, which chronicles the history of disease, politics, starvation, and the loss of life for Indigenous people on the Prairies. It won both great acclaim and numerous awards. More recently, his SPHERU colleague at the University of Saskatchewan, Dr. Rachel Engler-Stringer invited him to be guest speaker at the annual Canadian Association for Food Studies conference in May.

“It was quite different from our typical keynotes. Our typical keynotes study food all the time. Dr. Daschuk’s lecture placed historical food issues in the context of population health outcomes and helped us to better understand many of the health inequities experienced by Indigenous peoples today,” says Engler-Stringer.

She, herself, was recently named one of seven “Food Heroes” by Slow Food in Canada for her research into food environments.

The research connections extend beyond those that work within SPHERU to include others beyond the provincial borders. For example, Dr. Shanthi Johnson, a long-time SPHERU researcher, has spent part of this past year working as a Fulbright Canada scholar in a partnership with the Florida Policy Exchange Center on Aging, University of South Florida, where she is looking at nutrition and food-related policies in nursing homes as well as falls and injury prevention policies within the active aging framework in Florida and Saskatchewan. This will provide an opportunity to fill research gaps by examining aging issues from cross-cultural and multidisciplinary perspectives.

In 2014, SPHERU also collaborated with the Community-University Institute for Social Research (CUISR) at the University of Saskatchewan to publish *Journeys in Community-Based Research* from University of Regina Press, which includes contributions from many SPHERU researchers, among others, and highlights the importance of collaboration between academic researchers and community partners.

Finally, together with Margaret Baker from the Ministry of Health, SPHERU researchers Dr. Nazeem Muhjarine and Dr. Cory Neudorf are the provincial leads in the new SPOR Pan-Canadian Network in Primary and Integrated Health Care Innovations (PIHCI). PIHCI is a collaborative network of Saskatchewan researchers, physicians, community members, and policy-makers that will focus on generating new evidence in primary and integrated health care effectiveness, efficiency, and access across the care spectrum.

Connecting with Communities

For many of SPHERU’s projects, researchers connect with communities, not simply conducting research on them but in partnership. For the current SHRF Phase III Health Research Group Grant, the SPHERU team is working with the communities of Young, Watrous, Rosetown, and Wolseley. Led by Dr. Bonnie Jeffery, *Healthy Aging in Place: Improving Rural Seniors’ Health Through Policy and Community Level Interventions 2014-2017*, is made up of three studies: Improving Rural Seniors’ Mobility and Social Interaction through Intervention Research; Supporting Healthy Aging through Walkable Built Environment; and Addressing Rural Seniors’ Access to Information. These will all examine interventions designed to allow rural seniors to age in place, without having to leave their communities. The engagement of each research community from the early planning stages has ensured that the projects are focused on immediate priorities of seniors with interventions identified that lend themselves to sustainability beyond the life of the funded research.





Healthy Aging in Place Research Team 2014-17.

“The SPHERU researchers do their work in a way that includes all of us in deciding what questions are really important to the older adults living in rural areas and they continue to come to our communities and our homes to make sure that their research makes a difference,” says Noreen Johns, community research partner from Zelma, Sask. “The work that SPHERU researchers are doing with us has provided a foundation for us to develop interventions that are meaningful to the lives of seniors in our rural communities.”

Building from the SHRF Phase II Health Research Group Grant, Dr. Sarah Oosman and Dr. Sylvia Abonyi, along with community partners Liz Durocher and T.J. Roy, are leading a CIHR-funded team that is looking at aging in the northern Saskatchewan Métis community of Île-à-la-Crosse. Over five years, the *Wuskiwiy-tan! Let's Move!* project will use mixed methods to reveal concepts and experiences of healthy aging by involving seniors, adults, and children from the community.

Yet another project, led by Dr. Nuelle Novik, explores emotional and mental healthcare supports for seniors and will include participation of people from the Sunrise Health Region in and around Preeceville and Norquay, as well as areas around Ituna and Melville.

Connecting for Change

Another key connection is with policy makers at all levels of government. The Healthy Children team's multi-phase *Smart Cities, Healthy Kids* project, led by Dr. Nazeem Muhajarine, has been looking into the links between children's activity levels and how cities are designed – in the case of the study, Saskatoon. More recently, Dr. Rachel Engler-Stringer has been examining food environments and children's nutrition throughout the city, while a current phase of the project is researching the effects of seasons on children's activities. Throughout the various *Smart Cities* phases, the team has involved many partners, most notably representatives from school divisions and planners from the City of Saskatoon, to look for ways on how public policy in a manner can encourage better eating habits and more physical activity among school-aged children.

Over the years, the research unit has also undertaken many evaluations of projects or studies for organizations or institutions,

and produced a number of reports, as a means towards making better policy or encouraging best practices. A recent example includes an evaluation, led by Dr. Sarah Oosman for Health Canada, on the implementation and integration of two interventions designed to promote healthy lifestyles among Indigenous children and youth.

Sharing These Connections

All of these connections – whether with the universities of Regina and Saskatchewan, other researchers, community partners, or policy makers – are rooted in SPHERU's diverse knowledge translation strategies and activities. The work does not stop there though, as the unit continues to look for new methods to share its research with the wider community, even by embracing new technology.

When the population health history team led by Dr. Tom McIntosh and Dr. Paul Hackett, uncovered a 100-year-old report, *The Preliminary and General Social Survey of Regina* released in 1913, they used Twitter to highlight population health disparities that have persisted in Regina for a hundred years. More recently, the unit used a software application called BEEDOCS to develop a timeline on the SPHERU website that chronicles more than a century of historical developments in health, as well as the social determinants of health, in the province. The goal is for the timeline to be a teaching and learning tool.

These new technical applications, however, are only part of the way that the SPHERU stays at the forefront of research into how governments, researchers, communities and others can reduce population health inequities through a social determinants of health lens.

As SPHERU Associate Director Tom McIntosh says, “Even more important to SPHERU's future is the group of new scholars who have joined in recent years. This new blood brings with it new research agendas, new approaches and new opportunities for effecting change in the province. And it ensures that the work begun over fifteen years ago continues to adapt to meet the challenges of the future.”

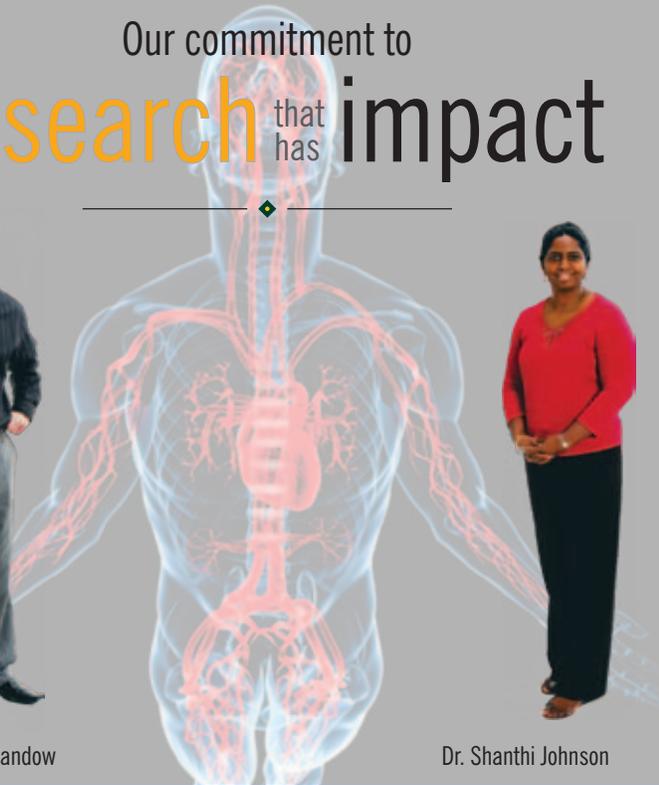


Article and photos contributed by Saskatchewan Population Health and Evaluation Research Unit

Our commitment to
research that has **impact**



Dr. Darren Candow



Dr. Shanthi Johnson

Dr. Shanthi Johnson and **Dr. Darren Candow** are just two of the researchers at the University of Regina's Faculty of Kinesiology and Health Studies working to improve the quality of life for older Canadians.

Among her areas of study, Johnson examines the role nutrition and exercise regimens play in improving physical capabilities and prevention of falls among seniors in community and long-term care settings. Candow is working to develop effective resistance training and nutritional routines to improve aging muscle and bone health. They both work in partnership with community and industry to improve the lives of older Canadians and save health care costs.

The University of Regina has established a proud tradition in population health research. Our researchers are collaborating with others across Canada and around the world to expand the frontiers of knowledge and improve the quality of life for Canadians.

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University
of Regina



The Health Quality Council's mission is to accelerate improvement in the quality of health care throughout Saskatchewan.

Our focus on building capability for continuous improvement and patient-oriented research in Saskatchewan's health system supports this mission.

To find out how HQC is making a difference for patients and health providers in this province, visit www.hqc.sk.ca.





The Diagnostic and Statistical Manual of Mental Disorders, fifth edition defines traumatic stress as exposure to death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence.

Better Understanding for Better Care

Traumatic Stress and Health Care Experiences

Trauma exposure is a common issue with the majority of people experiencing some form of trauma at least once in their life. Unfortunately, people with a history of being exposed to trauma, specifically interpersonal – ‘betrayal’ type – trauma committed by someone they know or trust, often deal with many negative health outcomes.

“Trauma exposure can impact how we function in our interpersonal relationships and impact our trust in individuals and institutions,” says Dr. Bridget Klest, assistant professor in the Department of Psychology at the University of Regina. “For example, trust in physicians has been associated with better adherence by patients to their recommended care. While there is good reason to suspect that individuals with a history of trauma exposure have poorer relationships with healthcare providers, this has not been tested directly.”

In 2014, Dr. Klest received an Establishment Grant from SHRF to further explore how a person’s history of exposure to trauma is associated with more negative views of healthcare providers and systems. Her clinical training at the San Diego Veterans Affairs Medical Center, University of Washington Department of Rehabilitation Medicine, and Seattle Veterans Affairs Medical Center sparked her research interest.

“Through my clinical work, I noticed there wasn’t a lot of research being done to gain a better understanding of whether trauma survivors are more prone to having negative healthcare experiences,” says Dr. Klest. “However, the research is important as it gives us the context required to develop adequate interventions that meet the needs of healthcare providers and trauma survivors.”

Klest established the Social Context, Health, and Trauma Lab at the University of Regina, where she works with two graduate students, various research assistants, and volunteer undergraduate students. This study will consist of three related studies.

With the first stage of research complete, preliminary findings reveal that individuals that have experienced ‘betrayal’ type trauma are more likely to have negative experiences or trust issues with

DID YOU KNOW?

Two-thirds of individuals have experienced at least one traumatic event.

the healthcare system. In saying that, not everyone who experiences trauma goes on to have negative experiences with the healthcare system. “It is partly related to how they interpret these events,” says Dr. Klest. “For example, does negative thinking equal poor healthcare experiences? Or is how we view the world affecting how we experience it?”

Another thought raised is, could any situation in that chain of interactions affect our experience. For example, what if the receptionist at the medical clinic or another patient in the waiting room wasn’t supportive? Could these trigger negative healthcare experiences for trauma survivors?

“These complexities and questions are the biggest puzzle my team is facing right now,” says Dr. Klest. “We don’t fully understand the problem and that is our main goal right now.”

Interestingly enough, as Dr. Klest and her team peel back the layers, the project continues to evolve and grow. “We are not just looking at the perspective of patients anymore, we are also collecting data from physicians,” says Dr. Klest. “Research shows that physicians believe they are inadequately equipped to address the complex needs of trauma patients.” Adding the perspective of physicians is important, because it allows Dr. Klest to interpret both sides of the story.

The more trauma people experience throughout their life, the more it continues to compound the issue, creating long-term health burdens on trauma survivors, healthcare providers and the healthcare system. Ideally, the research findings should provide the context necessary to develop interventions aimed at meeting the needs of the healthcare system and trauma survivors. This research is a step towards gaining a better understanding for better care. 

Why Does Health Research Matter?

The Regina Qu'Appelle Health Region (RQHR) has a long history of supporting health research. We know from experience that a vibrant culture of research carries great benefit.

Health research plays a critical role in helping us achieve our vision of healthy people, families, and communities. We have over 80 doctors, pharmacists, dietitians and other health professionals who work closely with our experienced research department. Together, they engage in research designed to improve patient care and health outcomes. Our strategy of supporting research ideas that come directly from front line clinicians, allows us to know that our research is patient-oriented, practical and value-added. The efforts of the RQHR's dedicated clinician-researcher teams continue to inform and encourage improvements in the quality and efficacy of our services.



The profiles of five local teams of researchers are featured on the pages that follow. These individuals are among the many success stories we have of RQHR clinicians who are making a difference in our organization. I invite you to learn about these dedicated individuals and the important work that they do.

Mr. Keith Dewar
President and CEO
Regina Qu'Appelle Health Region





From L to R: Dr. Melad Shawush, Dr. Sebastian Harenberg, Dr. Jennifer St.Onge, and Research Assistant Jill Robinson

Better Care for Ruptured Abdominal Aortic Aneurysms

An abdominal aortic aneurysm (AAA) is a swelling of the aorta which is the main blood vessel that leads away from the heart, down through the abdomen to the rest of the body. Ruptured AAAs can result in massive internal bleeding and are usually fatal in up to 70% of people. The aorta is such a large blood vessel that, if it ruptures, death can be very rapid. Patients throughout southern Saskatchewan must be transferred to Regina for treatment of a ruptured AAA, making early intervention all the more crucial for patients living in smaller communities.

Dr. Jagadish Rao is the Medical Director of the Trauma Program in the Regina Qu'Appelle Health Region (RQHR). He is leading an interdisciplinary research team of vascular surgeons, research scientists and a pharmacist, in a study designed to increase the survival rate of patients suffering from a ruptured AAA. The benefits of using the drug tranexamic acid (TXA) for reducing bleeding have long been recognized in other conditions. Dr. Rao's team is currently investigating the novel application of TXA as a treatment for reducing blood loss and improving outcomes for patients with a ruptured AAA.

With funding from the Saskatchewan Health Research Foundation, this pilot study investigates whether early treatment with TXA after diagnosis will significantly reduce blood loss, which may increase the use of less invasive surgery, reduce complications, and ultimately, save lives. The researchers intend to expand this pilot study to communities throughout southern Saskatchewan in 2016. If the results are positive, the next step will be a multi-site study across Canada.

Improving Quality of Life in MS

Saskatchewan has one of the highest rates of Multiple Sclerosis (MS) in Canada. It is a chronic disease that causes the body's immune system to attack the brain, spinal cord and optic nerves. As the nerve fibers deteriorate, individuals living with MS may begin to suffer from problems with attention, memory and other cognitive functions. Simple day-to-day activities such as walking in crowds or driving in traffic can be affected. The destruction of nerve fibers can also lead to depression and cause falls. Unfortunately, very few rehabilitation options are available to

treat these problems, and this is especially true for people living in rural communities.

Dr. Jennifer St.Onge and Dr. Sebastian Harenberg are researchers from the Regina Qu'Appelle Health Region (RQHR) who are interested in discovering how health care technologies can be used for the rehabilitation of cognitive impairments for people with MS. Partnering with RQHR neurologists (Dr. Vinesh Pillay, Dr. Zia Rehman, Dr. Melad Shawush, Dr. Felix Veloso) and a professor from the University of Regina (Dr. Kim Dorsch), the team is testing the effectiveness of a portable 3-D multiple object tracking training program (NeuroTracker®) to improve attention and other cognitive functions in people with MS. This software is easy-to-use, portable, and specifically designed to train cognitive areas (e.g., attention, speed processing) that are often impaired in people living with MS, but has yet to be tested in this group.

Through their research, the team hopes to find a cost-effective and accessible strategy to improve the quality of life for people living with MS throughout Saskatchewan.



From L to R: Dr. Don McCarville, Dr. Jennifer St. Onge, Dr. Jagadish Rao, Dr. David Kopriva, Dr. Michelle McCarron, Suzanne Gulka

Optimal Health Care for Children

Dr. Juliet Soper is a general pediatrician and head of the Department of Pediatrics in the Regina Qu'Appelle Health Region (RQHR). As a hospital based general pediatrician she is part of a team who provide care to ill children in the pediatric unit and high acuity area at Regina General Hospital. Dr. Soper also works with the therapy team at Wascana Children's Program providing anticipatory guidance for children with developmental concerns, and with community based organizations such as Regina Children's Justice Centre to provide assessment, necessary treatments and support to children suspected of being victims of child maltreatment.

Since moving to Regina from New Zealand in 2012, she has focused her research efforts on promoting systems that facilitate the delivery of appropriate and optimal health care. Her training abroad has provided her with a unique perspective from which to view local processes.

Deeply rooted in real-world frontline care issues, Dr. Soper has been a champion for young people in the RQHR. Her research seeks to ensure that they are receiving the best possible care while in our care. Sometimes however, the best possible care means receiving fewer interventions. As such, Dr. Soper's studies have examined the overuse of standard procedures that can be traumatic to young children and/or that can lead to greater harm. For example, young children with fever and no identifiable focus for infection often receive IV antibiotics until blood cultures are negative at 48 hours. Minimizing the number of peripheral intravenous lines a child needs during an admission is desirable due to the anxiety and trauma that occurs with insertion. Other targeted areas for improvement include the reduction of unnecessary suctioning of babies born by caesarean section, and reducing unnecessary neuroimaging (CT or MRI) of children with simple febrile seizures.



*Dr. Juliet Soper,
Head of Pediatrics*

Dr. Soper continues to inspire medical graduates to pursue research in quality assurance monitoring and improving patient care through adherence to clinical standards. It is this frontline focus that ensures appropriate and efficient service delivery but ultimately makes a difference in the lives of our patients.

Two Little Questions Making a Big Impact

A recent study revealed that 45% of people admitted to medical and surgical units in Canadian hospitals are malnourished. Being malnourished places you at a high risk of experiencing delayed wound healing, more complications and longer hospital stays.

Hospital malnutrition is not new, but until recently there was little information on how big of a problem it was in Canadian hospitals.

Thanks to a nationwide study led by Dr. Heather Keller from the University of Waterloo, there are important changes underway in the Regina Qu'Appelle Health Region (RQHR). A simple two question screening tool is being used to identify patients who are malnourished. Answering yes to both is considered a positive screen and means more



*From L to R: Lori Hopauf, Taryn Lorencz, Dr. David McCutcheon,
Stephanie Cook, Shannon Cowan, Roseann Nasser*

nutritional assessments are needed.

- Have you lost weight in the past 6 months WITHOUT TRYING to lose this weight?
- Have you been eating less than usual FOR MORE THAN A WEEK?

The RQHR was selected as one of five locations in Canada to participate in the 18-month "More 2 Eat" study which aims to find ways to improve the food intake and nutrition status of patients in the hospital by screening patients with those two simple questions. The local oversight team includes Dr. David McCutcheon (VP, Medicine), Lori Hopfauf (ED, Medicine), Stephanie Cook (Director, Nutrition & Food Services/NFS) and lead investigator, Roseann Nasser (Research Dietitian, NFS). A strong interdisciplinary steering committee has been assembled to identify areas for improvement and to implement a nutrition care pathway for all patients. This steering committee includes Shannon Cowan (Senior Dietitian), Taryn Lorenz (Director, Medicine), and Dr. Ron Taylor (Hospitalist).

Safe and Effective Medication Use

Pharmacists have had a long-standing and powerful research presence within Regina Qu'Appelle Health Region (RQHR). Their research focuses on issues affecting safe and effective use of medications within the organization. As such the research conducted by the pharmacy department is translational and of direct benefit to RQHR patients.

Research has been embedded in the day-to-day activities of the department. Everyone from the leadership level of the department to pharmacy residents and frontline pharmacists play an important role in improving patient outcomes through the process of scientific inquiry. Another factor linked to the department's success is the accredited pharmacy residency program they have directed for almost 50 years. This very successful training program has granted the ACPR (Accredited Canadian Pharmacy Resident) designation to over 75 residents. With expert guidance and support from pharmacy resident supervisors such as Dr. Bill Semchuk and Dr. Jennifer Bolt, the graduates develop the skills required to take a research idea from inception to completion as part of this clinical training program. It is not uncommon to see former graduates assist current residents as mentors and co-investigators, thus continuing the strong cycle of research within the department.

Recent research projects led by pharmacy residents have included the assessment of a transition in care process at the community pharmacy level, assessment of dose appropriateness for patients discharged on direct oral anticoagulants and a pan-Canadian survey of regional practices regarding antibiotic dosing in pediatric patients. Graduates of this program have won both local and national awards for their research, as well as shared their findings through publications and local and national conference presentations, ensuring that the research that benefits our patients can be shared with others.



From L to R: Dr. Bill Semchuk, Dr. Jennifer Bolt, Kyle Wray, Zack Dumont, Lori Albers, Amanda Hitchings



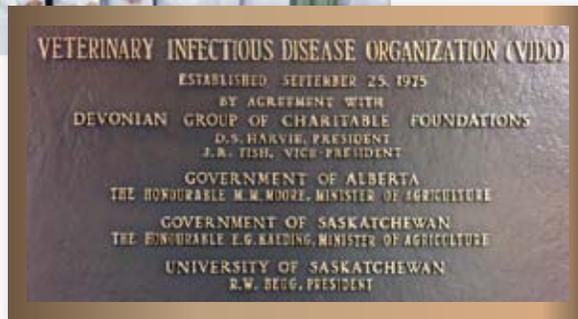
Article and photos contributed by Regina Qu'Appelle Health Region.



40 years

of impact

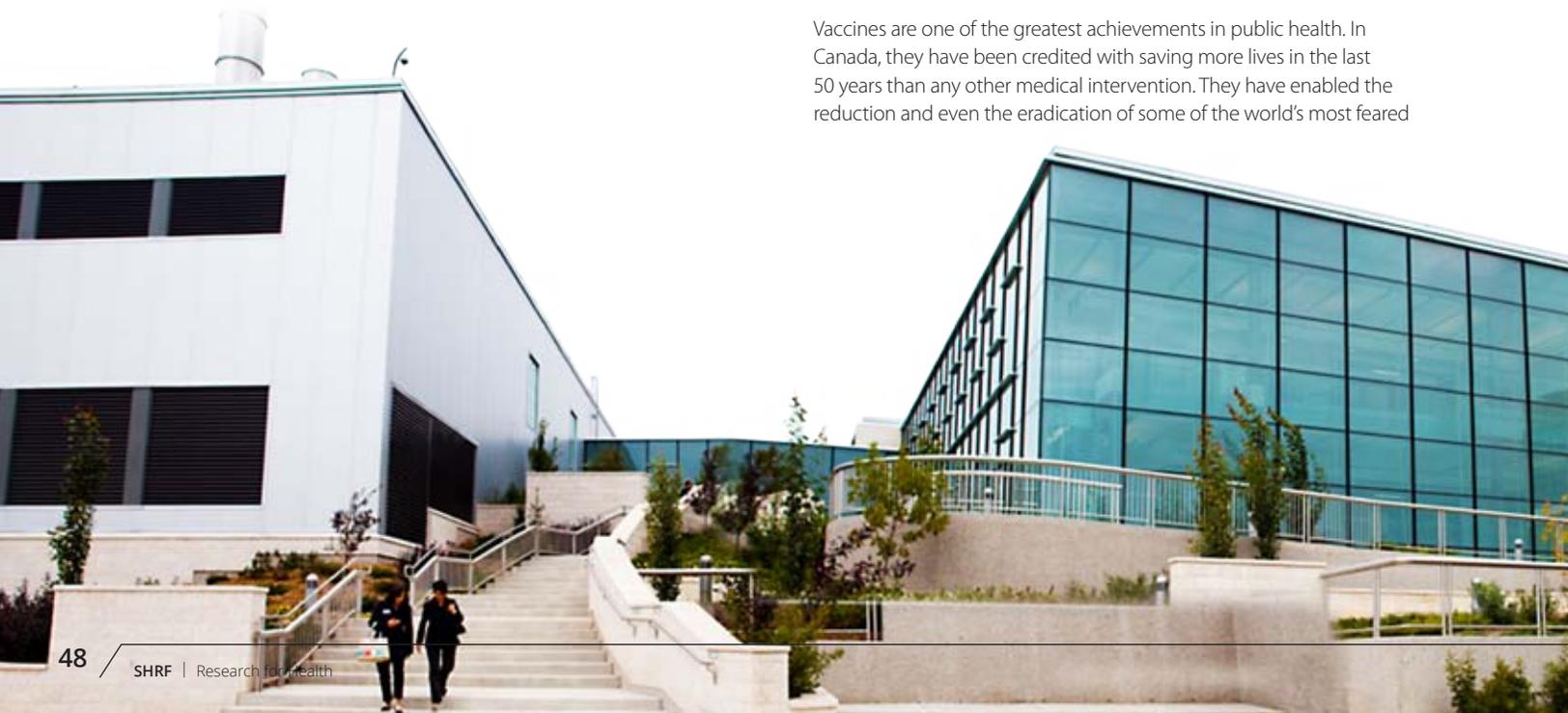
In 1975, the University of Saskatchewan in partnership with Western provinces and the Devonian Foundation established the Veterinary Infectious Disease Organization (VIDO) to provide practical research on the infectious diseases of animals.



During the past 40 years, as VIDO added infrastructure, commercialized eight vaccines, and continued to expand its vaccine development mandate, the facility was renamed the 'Vaccine and Infectious Disease Organization' (VIDO) and most recently, with the addition of the 'International Vaccine Centre', VIDO-InterVac. Today, VIDO-InterVac is in a new era of vaccine development, focused on new animal models, host-pathogen interactions, new vaccines, and novel vaccine formulations (e.g., adjuvants) to protect animal and human health. This is driven by a talented interdisciplinary team of more than 165 personnel representing over 20 countries in an ISO9001 certified environment.

Despite significant advances, infectious diseases continue to be a worldwide challenge. Diseases such as measles and pertussis have re-emerged and are once again a threat to the health of our children. Antimicrobial resistant bacteria including methicillin-resistant *Staphylococcus aureus* (MRSA), tuberculosis, and gonorrhea are on the rise, and hospital-acquired infections can be found more commonly across the country. Furthermore, new pathogens continue to emerge around the globe, sometimes with devastating socioeconomic outcomes. Fifty percent of childhood deaths in the developing world are due to infectious diseases. The control of infectious diseases remains a high priority around the world.

Vaccines are one of the greatest achievements in public health. In Canada, they have been credited with saving more lives in the last 50 years than any other medical intervention. They have enabled the reduction and even the eradication of some of the world's most feared



infectious diseases, including polio and smallpox. Importantly, they enable the protection of our most vulnerable citizens by blocking the chain of infection through 'herd immunity'. However, vaccine development for some of our most challenging diseases requires new methods of thought and approach. One such approach, used by our organization, is the use of real animal diseases as models for human vaccine development. This is enabled by the expertise developed by our scientific staff during veterinary infectious disease research and is even more important today considering an estimated 70% of new human diseases arise from animals.



One of the key aspects of infectious disease research is the safety designations required to work with the microbes, defined in terms of containment (or biosafety). These range from level 1 (lowest) to level 4 (highest). The higher the containment number the more precautions required, including personal protective equipment. VIDO-InterVac has more than \$200 million of the world's most advanced containment infrastructure, including one of the world's largest containment level 3 facilities. Notably, many of the emerging and re-emerging diseases and potential bioterrorism agents are classified as level 3 or higher. In addition, there are few facilities in the world that can accommodate large animals with the capacity to generate the statistical power to demonstrate the effectiveness of the vaccine. This will help address national and international delays in research and result in quicker development of important vaccines.

We have continued to make significant advances for human and animal health in vaccines and related products. For example, novel formulations to enhance vaccine efficacy and alternative delivery methods will improve vaccine performance and should assist with social uptake. This is particularly important in a time where increased international travel, urban development and population density are enhancing the ability of infectious disease to spread internationally. Examples of some of the current projects at VIDO-InterVac are highlighted below.

A Vaccine for Respiratory Syncytial Virus

Respiratory syncytial virus (RSV) is one of the most common respiratory pathogens in infants and children under two years of age. In some children RSV causes severe pneumonia often

requiring hospitalization. Our scientists created a prototype vaccine using a novel adjuvant developed in partnership with several partners that proved highly effective in preclinical animal models established at VIDO-InterVac. In partnership with the Pan-Provincial Vaccine Enterprise (PREVENT), Dalton Pharmaceuticals, the South China United Vaccine Institute and the Guangzhou Institute of Respiratory Disease we are aiming to enter clinical trials for this vaccine in 2016.

Vaccines for Sexually Transmitted Diseases

Sexually transmitted diseases continue to be a major health concern worldwide due to their potential to cause infertility and increase the risk for co-infections with human immunodeficiency virus (HIV). In addition, several strains of *Neisseria gonorrhoeae* resistant to all antibiotics have been identified and pose a serious threat to communities where the disease is endemic. Vaccines are not available, and the development of effective vaccines is complicated by the lack of good animal models. Researchers at VIDO-InterVac are developing novel animal models for chlamydia and gonorrhoea, which will enable development and testing of new treatments and vaccine candidates.

Vaccines for Emerging/Re-emerging Diseases

We have recently initiated vaccine development projects on several level 3 diseases, including tuberculosis and Middle-East respiratory syndrome (MERS). Both of these pathogens are zoonotic and are a significant concern to human health. Scientists and clinical veterinarians at VIDO-InterVac are developing animal models in containment level 3 and are preparing to develop prototype vaccines using a technique referred to as reverse vaccinology.

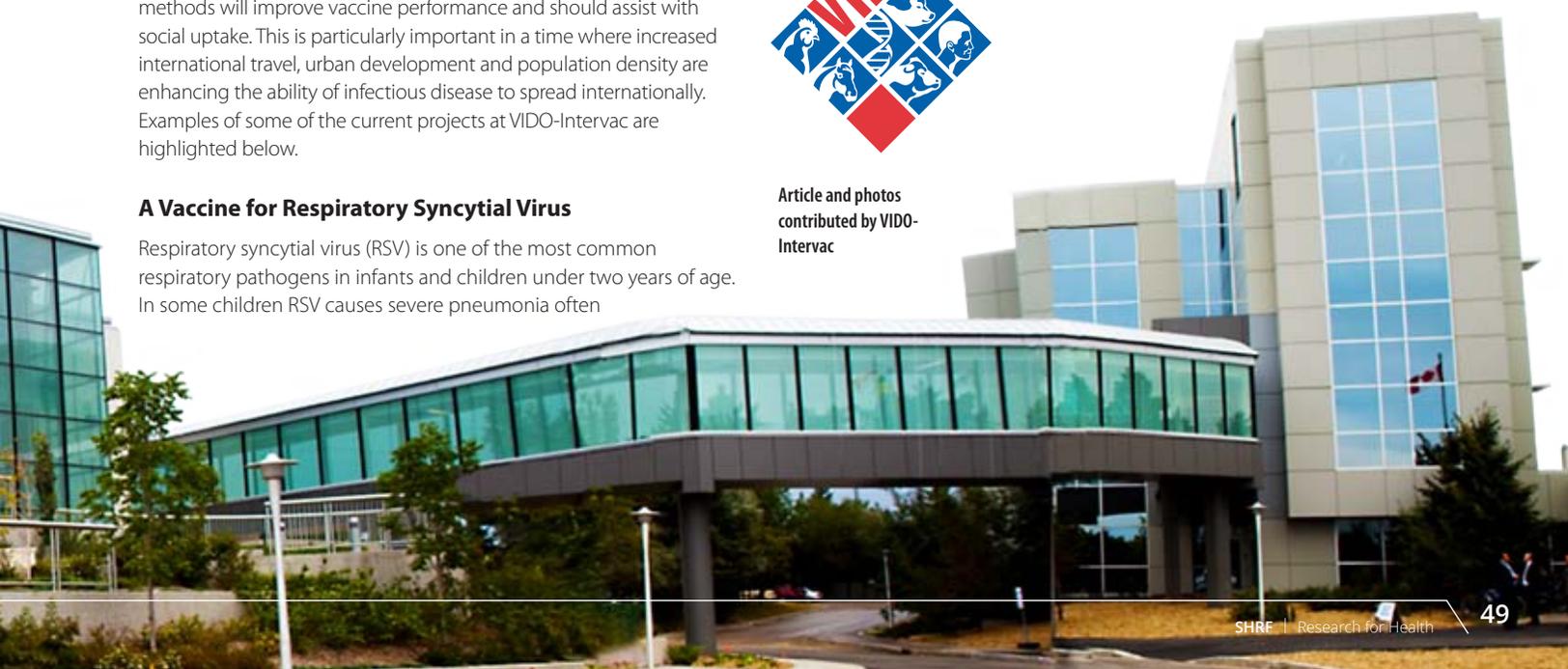
The control of infectious diseases through the use of vaccines remains a high priority for public health researchers around the world. Our ability to research key human, animal and zoonotic diseases in naturally susceptible species enhances the development of vaccines for more challenging diseases. Innovative research and development capabilities will also assist companies in the regulatory requirements to bring these to market faster. By ensuring our scientific advances reach the clinics instead of being left at the bench we will safeguard the health of our nation and our world.

DISEASES AND CONTAINMENT

- Hepatitis B – **Level 2**
- Measles – **Level 2**
- Pertussis – **Level 2**
- RSV – **Level 2**
- Anthrax – **Level 3**
- Influenza – **Level 2 and Level 3**
- Mycobacterium (TB) – **Level 3**
- Yellow fever – **Level 3**
- Ebola – **Level 4**



Article and photos contributed by VIDO-InterVac



Food Environments: Five Years Later

A follow-up with
Dr. Rachel Engler-Stringer



Dr. Rachel Engler-Stringer, associate professor, Department of Community Health and Epidemiology, College of Medicine, University of Saskatchewan

It's been five years since Dr. Rachel Engler-Stringer, associate professor in the Department of Community Health and Epidemiology at the University of Saskatchewan, was funded for a SHRF Establishment Grant to look at the availability, accessibility and quality of food in Saskatoon neighbourhoods for families with children. When asked five years later what her research has resulted in, her reply is more research.

"Five year follow-up sounds funny to me," says Engler-Stringer. "The reality is all of my research is connected and constantly evolving."

And that, in essence, is the nature of research. It's an iterative process. It builds and adapts to changing situations, landscapes and discoveries. Other grant opportunities come into play and have a role in shaping the direction and scope of research.

At the time of applying for her first SHRF grant in 2010, there was limited research being done in the area of food environments in Canada. Engler-Stringer is currently one of the authors of an article looking at what has been published up until now in this area. Where prior to 2010 there were only a handful of articles published in Canada in total, now she is seeing about four or five articles a month from around the world pop up in her notifications.

"When first thinking about this research it was very descriptive, it was very much [about] let's characterize food environments," explains Engler-Stringer. "Now it's shifting and part of it is moving towards more sophisticated methods and ways of examining relationships between different food environment factors."

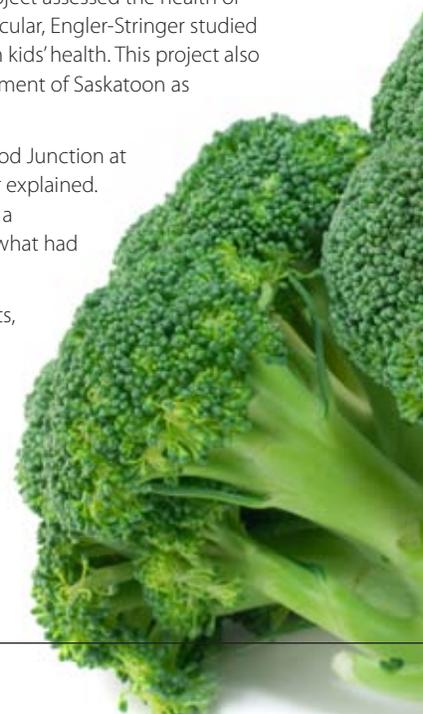
The research area has not only grown exponentially in the past few years, but it's shifted towards the study of interventions in food environments. That's also where Engler-Stringer's research has been moving. In addition to funding received from Canadian Institutes of Health Research (CIHR), SHRF awarded Engler-Stringer with a Population Health Intervention Grant in partnership with CIHR, a Collaborative Innovation Development Grant and a Research Connections Grant in the past two years towards her continued research.

All of Engler-Stringer's research is done in collaboration with community organizations, the Saskatoon Health Region, the City of Saskatoon, other researchers or a combination of these, depending on the project. Engler-Stringer was involved in the *Smart Cities, Healthy Kids* project. This project assessed the health of kids in urban environments, and in particular, Engler-Stringer studied the impacts of the food environment on kids' health. This project also helped to characterize the food environment of Saskatoon as a whole.

"While we were doing this, the Good Food Junction at Station 20 West opened," Engler-Stringer explained.

"That was a really important example of a community opening a grocery store in what had been categorized as a food desert."

Canada doesn't have a lot of food deserts, compared to the US, but Saskatoon's inner city was one of them. The Good Food Junction opening presented a particular opportunity. Engler-Stringer was already familiar with the food environment in the area through conducting her research and working as a community-based health researcher out of Station 20 West.



DID YOU KNOW?

Food Facts

Studying the Good Food Junction raised other questions around the complicated ways in which people are accessing food in situations of poverty. This led to a desire for more qualitative research and Engler-Stringer is now doing critical ethnographic work in the inner city to examine in depth household food practices in Saskatoon's inner city.

Though Engler-Stringer feels her work is continuous, that doesn't mean the impact of her work, and the work of other researchers in the area, is not being felt. The recently held Food Environments in Canada 2015 Symposium and Workshop that Engler-Stringer was involved in organizing was hugely successful and useful. It resulted in great collaborations for the study of food environments across Canada. From the information shared and gathered, Engler-Stringer and her colleagues are working on a collection of articles that will become a special issue in the *Canadian Journal of Public Health*.

An important part of what Engler-Stringer has done is present the results of her work back to stakeholders such as the school boards, the City of Saskatoon and broader community partners. They have helped narrow down the most important recommendations to affect positive change by way of developing programs or implementing policy changes. These recommendations will be presented at a workshop for the Ontario Public Health Association where Engler-Stringer and colleagues have been invited to speak.

Engler-Stringer has also been working with other professionals, especially those in the field of nutrition and public health. She shares ways in which they can become involved in doing research themselves at the community level and the kind of changes they can advocate for. Several organizations have taken her results and used them in their own applications for grants and funding to gain support for community programming. Engler-Stringer is continually focused on ways to use her research position to make an impact on people's day to day lives.

The research Engler-Stringer and her colleagues have done over the past five years has not only put Saskatoon on the map as a place where important research is happening, but a place that is leading in the study of food environments. This success has translated to recognition, as well as further funding, which is not always easy to achieve in the competitive atmosphere of research grants.

"I feel very lucky that it all happened so quickly for me. I don't think that's typical," comments Engler-Stringer. "For new researchers to be able to have that provincial source of funding is so important when you're just starting out. If you don't have that ability to apply at the provincial level, it's just that much harder." ☞



In Canada, probably the biggest issue when thinking about our food environment is not food deserts, meaning places where there's both no or limited access to healthy food combined with poverty, but food swamps, or the ubiquitous access to and bombardment of unhealthy food everywhere we go.

"On your route to work or wherever you're going, you're constantly surrounded by messaging and sources of unhealthy foods," says Dr. Engler-Stringer. "That is really important for all of us to consider when we're thinking about a desire to be healthy into the future, and a desire to decrease obesity prevalence. The healthy choice is not the easy choice; the easy choice is the unhealthy choice."

Food Environment:

Physical, socio-cultural, economic and policy factors that affect an individual's or a group of individuals' eating habits and patterns, including accessibility and availability to food, as well as marketing and advertising of food and food products.

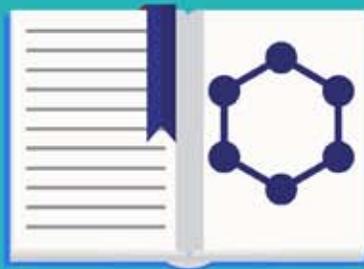
Rachel was picked as one of seven Food Heroes in 2015 by Slow Food in Canada.



DID YOU KNOW?

SHRF Fact

In the past 2 years, SHRF has signed agreements with Regina Qu'Appelle Health Region, Saskatchewan Polytechnic and St. Thomas More College which helps expand funding to even more clinical and applied researchers.



Alzheimer Society

S A S K A T C H E W A N

- Do you have Alzheimer's disease or a related dementia?
- Are you struggling to care for a family member or friend who has dementia?
- Are you having trouble accessing health care services in your community?
- Not sure where to turn for help?



The Alzheimer Society is here to help.

1-877-949-4141 www.alzheimer.ca/sk

DID YOU KNOW?

SHRF Fact



Dr. Darrell Mousseau

In 2015, the Alzheimer Society of Saskatchewan, SHRF and the University of Saskatchewan announced the renewal of the \$1 million Research Chair in Alzheimer's Disease and Related Dementia held by Dr. Darrell Mousseau.

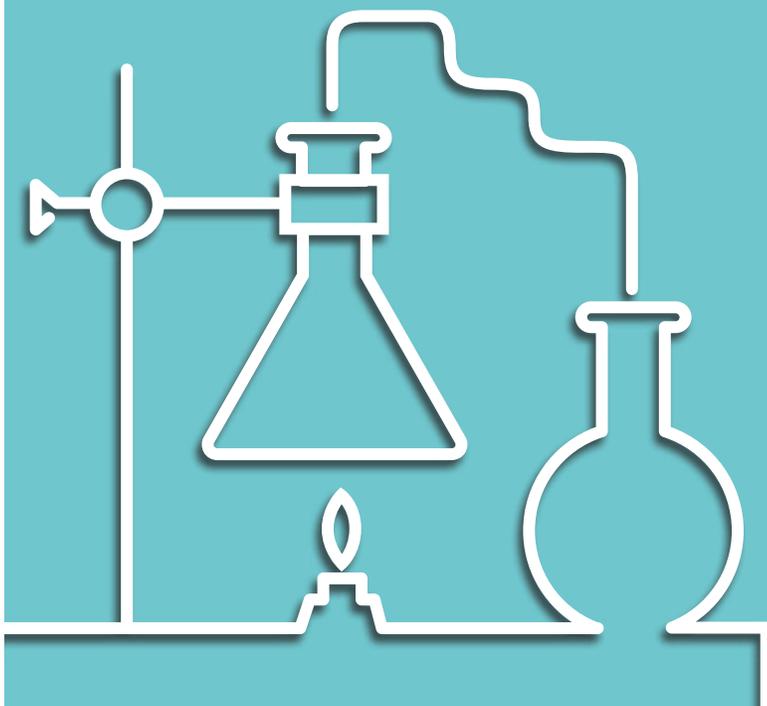
DID YOU KNOW?

SHRF Fact

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experts

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