

Public Health
What's Shaking It?
Is a Trust.



Recently, a dozen of our students traveled to U of T's Hart House Farm to study Indigenous health in one of the world's first public health land-based learning courses. A traditional knowledge keeper passed around a braid of sweetgrass and talked about what it could teach — how the blades are strong because they grow together. But their strength doesn't come from resisting the challenges they face. The grass is flexible: it bends to the wind rather than risk being broken by it.

We are facing hurricane-force winds in public health now, with the rise of artificial intelligence, machine learning and Big Data. The promise of this technology is staggering, especially in the face of a growing, aging population and rising rates of chronic disease. And yet, limitless possibility does not necessarily make things better. Technological advance may do great harm if it disrupts systems that currently work without achieving anything better. It can even smother us in a mound of possibility. At the same time, we face critical policy choices that will either promote a sustainable environment and equitable society or undermine it.

As a young school with deep roots, I believe we can respond well to these new challenges. We are flexible enough to change so we can broaden our effectiveness in advancing human health and its delivery.

My confidence was strengthened when I saw how well we came together this past year to take a big step toward that future. Our first Academic Plan will bring together teams of researchers with individual disciplinary excellence in areas like AI — but who will be much stronger together. And we will grow in many directions, with more faculty and course offerings and a greater commitment to equity. I believe a firm rooting in our place, going back to the very first inhabitants of Canada, will keep us grounded as we find our way in the high-tech future.

When the wind blows across sweetgrass, individual blades never meet it alone. Elders teach that they grow together, nurturing each other, and in the process not only bend with the wind, but help to shape its force and direction. The six stories in this report show how faculty and students at the Dalla Lana School of Public Health are working across disciplines, responding to the forces that shape human health in ways that reflect our deepening growth and maturity. They are emblematic of our future.

— Dean Adalsteinn (Steini) Brown



How the Dalla Lana School of Public Health is Indigenizing the teaching of public health.



Healing Begins on the Land

STORY BY
Heidi Singer

PHOTOS BY
Nick Iwanyshyn

A DOZEN PEOPLE — GRAD STUDENTS, A PUBLIC HEALTH nurse, a paramedic, a midwife and two physicians — had just finished a lesson in the proper way to split logs. Now they sat in a circle in a teepee trying to light a fire with metal. It wasn't easy.

"Learning how to make a traditional fire is teaching the self," said Clayton Shirt, Elder at DLSPH's Waakebusiness-Bryce Institute for Indigenous Health. "It's teaching patience and dealing with the fire within yourself. So it's very sacred."

The day was raw and wet, an early spring afternoon at Hart House Farm, about an hour's drive north-west of Toronto in the Caledon Hills. The students, all enrolled in public health or Indigenous studies courses at DLSPH or OISE, were spending five days learning about Indigenous health in one of Canada's first land-based learning courses.

"I feel like it's my responsibility to learn about Indigenous health as a non-Indigenous person entering healthcare," said Alice Gauntley, who is finishing her second year studying health promotion in the Master of Public Health program. "But I'm also grateful to participate in these ceremonies. I don't consider myself a spiritual person but I think it's valuable for me to get out of my comfort zone."

Learning on the land is really about learning from the land, said Professor Angela Mashford-Pringle, associate director of the WBIH and the second Indigenous person to receive a PhD from the school, in 2008. "It's the soil that's teaching them," she said. "The water, the plants, the animals and the trees are teaching through the Elders and Knowledge Keepers and me."

During their time on the farm, students searched for wild ginger, learned how to make tea from cedar, and communicated

with trees. But there were no chimes or water sounds playing in the background. Indigenous culture does not romanticize the land or shroud nature in New Age mysticism. The land is not an exotic other, said Mashford-Pringle. It is part of the self. She hopes that if students can understand that, they can begin to grasp why the residential schools, Sixties Scoop and other actions that separated Indigenous people from the land were so devastating to their health.

"If I first teach you how we relate to Mother Earth and Father Sky, and then I teach you about this trauma, maybe you can start to see how the loss of the land played into that trauma," said Mashford-Pringle. "Taking the land was the first way of traumatizing Indigenous people."

"We have to rebuild trust"

MANY OF THE STUDENTS IN THE LAND-BASED COURSE WORK with Indigenous people already, but worry that a lack of cultural understanding is creating barriers to healing.

"Understanding cultural safety is important going into it," said Campbell Drohan, a health promotion student preparing for her summer practicum working on vaccination hesitancy with the BC First Nations Health Authority. "I'm hoping to have a sharing circle



Students prepare to learn about the sacred fire ceremony



Scott Debassige, Knowledge Keeper, instructs students on the fire ceremony

with people from the community to try to understand where vaccination hesitancy is coming from. We have to rebuild trust.”

“You see people in their lived environment, but what good is it when you don’t have the knowledge to understand it?” asked paramedic Priscilla Sisourath. “We have Indigenous patients, but no ability or capacity to give them the empathy they need.”

The move to land-based learning is an attempt to truly Indigenize the educational experience so that public health workers can begin to gain the kind of understanding they’ve been missing, said WBIIH director Suzanne Stewart. She hopes this shift in thinking will address the root reasons for many of the failures of public health institution programs to improve Indigenous health.

“The Western paradigm has privileged the mind. In Indigenous culture, it’s the spirit and the heart that makes decisions and guides our lifestyle and behaviours,” she said. “Everything to do with Indigenous health is tied to spirituality, and spirituality is based in the land and in the relationship between land and people.”

Stewart said all of WBIIH’s courses, which include Indigenous public health, policy, research and environmental and food systems, will eventually be land-based. In the meantime, the Institute is helping people connect to the land in meaningful ways. Every Tuesday and Thursday, Clayton Shirt, the Elder, works with homeless Indigenous men to cultivate Indigenous plants in a medicine garden at The Stop, a Toronto food security hub. The men prepare and eat spiritually nourishing meals together.

Mashford-Pringle is working on a plan to Indigenize the DLSPH’s building itself, bringing culturally important plants to the front façade. She is also speaking out about how the land acknowledgements, which have become a staple way to open meetings at U of T and other institutions in Toronto, are performed.

Although well meaning, Mashford-Pringle says the practice of acknowledging original inhabitants and treaties often becomes a box to check rather than a genuine attempt to Indigenize the gathering with a reflection on the relationship between the land and self.

“If we’re not going to talk about how you as a person connect to this land, it’s worthless,” she said. “What does the Dish With One Spoon treaty mean? It’s about creating community and taking care of each other, but how many people who recite the words know that?”

Opening Up to Indigenous Ways

THE HOLISTIC EMPHASIS ON THE LAND, ANOTHER ASPECT of land-based learning, can also be a positive influence on environmentalism, which is still a Western movement, said Mashford-Pringle.

“Indigenous scientists will spend weeks observing a flower in a meadow,” she said. “They don’t pick it. They look at how it responds and moves with the light, what’s around it. Western

scientists will pick it, remove it from its context and bring it to the lab to look at its molecular structure. I don’t think one way is better than another, but I want students to understand both perspectives.”

Mashford-Pringle hopes Indigenous ways of knowing, particularly about the land, could help to heal the relationship between people and environment.

“How do we start to get people to think about planetary health without beating them over the head?” she asked. “Telling you to go touch a tree, walk on grass or meditate in front of a lake, none of these practices has a carbon footprint, and they are all deeply healing. Can you open up enough to see Indigenous ways of knowing and healing as a possibility? People have opened up to Traditional Chinese Medicine. Can they do the same for Indigenous healing? We find they can.”

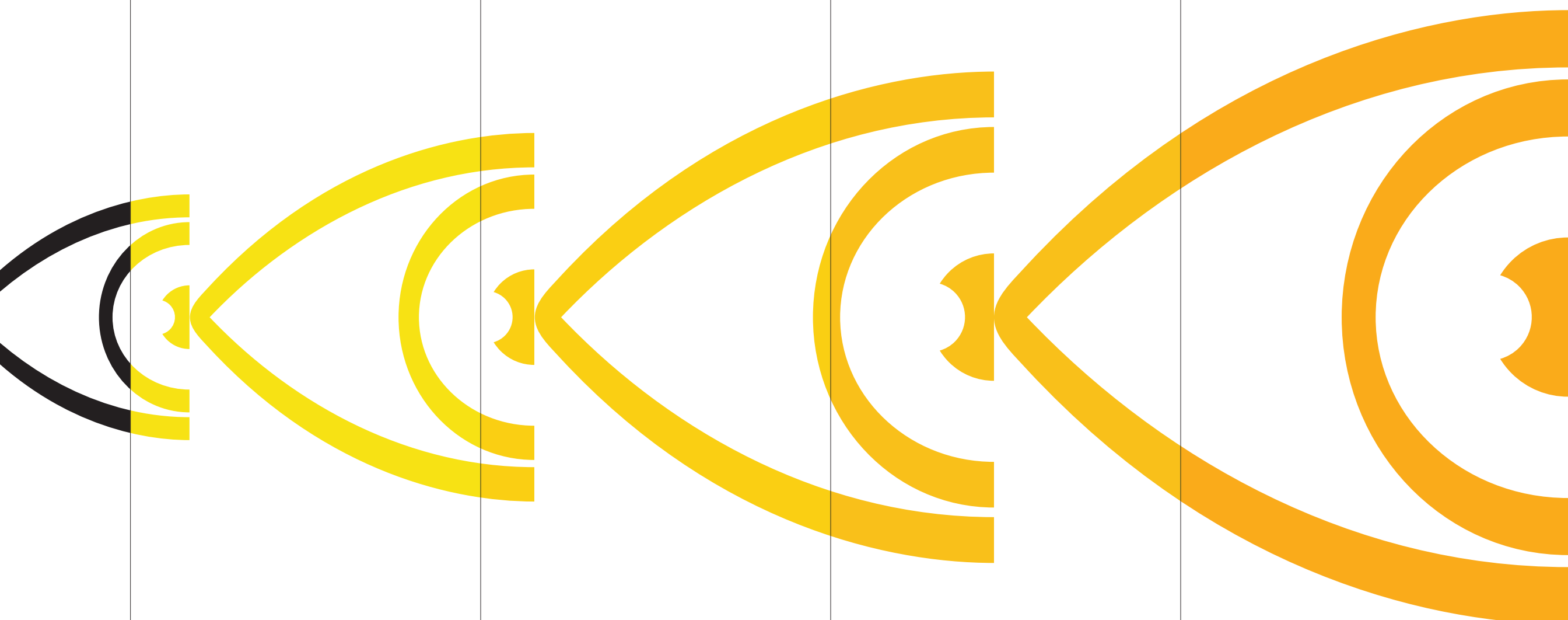
Land-based learning is not officially a part of DLSPH’s response to the Truth and Reconciliation Commission recommendations. But WBIIH leaders see it as an important step to teach the next generation of public health professionals about Indigenous trauma from an Indigenous perspective. It’s “a stepping stone, part of the healing we need to do between Indigenous people and DLSPH. There’s a ton of racism and discrimination in our health system,” said Mashford-Pringle. “Public health touches every area of the system. We need to get people in to help reduce the racism in our system. That’s going to be very healing.”





Telescoping Out / Going Deep

STORY BY
Kelly Holloway



ARMED CONFLICT IN MYANMAR AND buying hospital diapers are not conventional health policy topics. But for researchers at Dalla Lana's Institute of Health Policy, Management and Evaluation they are both elements in understanding health systems, and part of the Institute's challenge to us to rethink health policy.

I have experience being unconventional. I study health and medicine, but as a sociologist. I have worked with health researchers, doctors and midwives to understand health as not just biological, but also social and political. My approach makes the concept of health policy unwieldy. It is policy related to health, but health is affected by work, gender, socioeconomic status, ethnicity, sexuality, diet, the environment, politics, geography, history. So health policy is...everything?

In my two years as a post-doctoral fellowship at the Institute, I have had the good fortune of finding people who are also unconventional,

but have figured out how to translate their complex knowledge of the world into meaningful and concrete health policy. Greg Marchildon is one of them.

He started the North American Observatory on Health Systems and Policies, a partnership of researchers, governments and health organizations that promote health policy decision-making in Canada, the United States and Mexico. It's like a little sister to the European Observatory, minus the support of the European Commission. So a far less affluent sister, but with great ambition.

Marchildon started as an economic historian at Johns Hopkins University, and at first glance he fits the mold of a strait-laced professor. In his crisp navy blazer, he laments the messiness of his office, which is impeccably tidy. But he's clearly tapped in to a bigger political scene. His walls are adorned with prints from Frida Kahlo and Diego Rivera, Mexican artists devoted to social change. He likes their art, their appreciation of history, and that they challenged the status quo.

Better Health / Less War

THE OBSERVATORY HAS ALREADY DONE 16 "RAPID reviews" and a number of research studies commissioned by external groups looking at urgent health policy issues, including an influential one navigating the sensitive topics of cost and accountability for Canadian doctors. It is also publishing a series of Canadian-focused provincial and territorial studies, as well as national health system studies in Canada, the U.S. and Mexico, examining the social, political, economic and epidemiological context of healthcare policy by jurisdiction. The Observatory wants to create an infrastructure: "It's not about brand-new or innovative research findings in any one narrow area," said Marchildon. "We're about providing a foundation for good comparative health systems and policy research."

Marchildon thinks if you don't compare health systems you're more likely to get the wrong answer because you haven't learned from other people's mistakes. And others agree. His latest book on federalism and decentralization in healthcare was picked up in Myanmar, where internal armed conflict has been simmering for 70 years. As part of the peace process, members of the government, community health organizations and armed groups are using his work to help organize an effective decentralized federation in a multi-ethnic, multi-religious and multi-linguistic country. He's been there three times to talk to these groups about how civil conflict affects health outcomes, but also about how governments should focus their attention on healthcare.

Marchildon grew up in Saskatchewan, and after studying law, helped create the Saskatchewan Institute of Public Policy, which faced the threat of being shut down by government

fundors for its critical policy work. It's a pattern in his line of work, so he runs the Observatory as an academic, non-profit centre that doesn't rely on government funding. It gets most of its money from grants and research contracts and won't accept funding from sources with a conflict of interest.

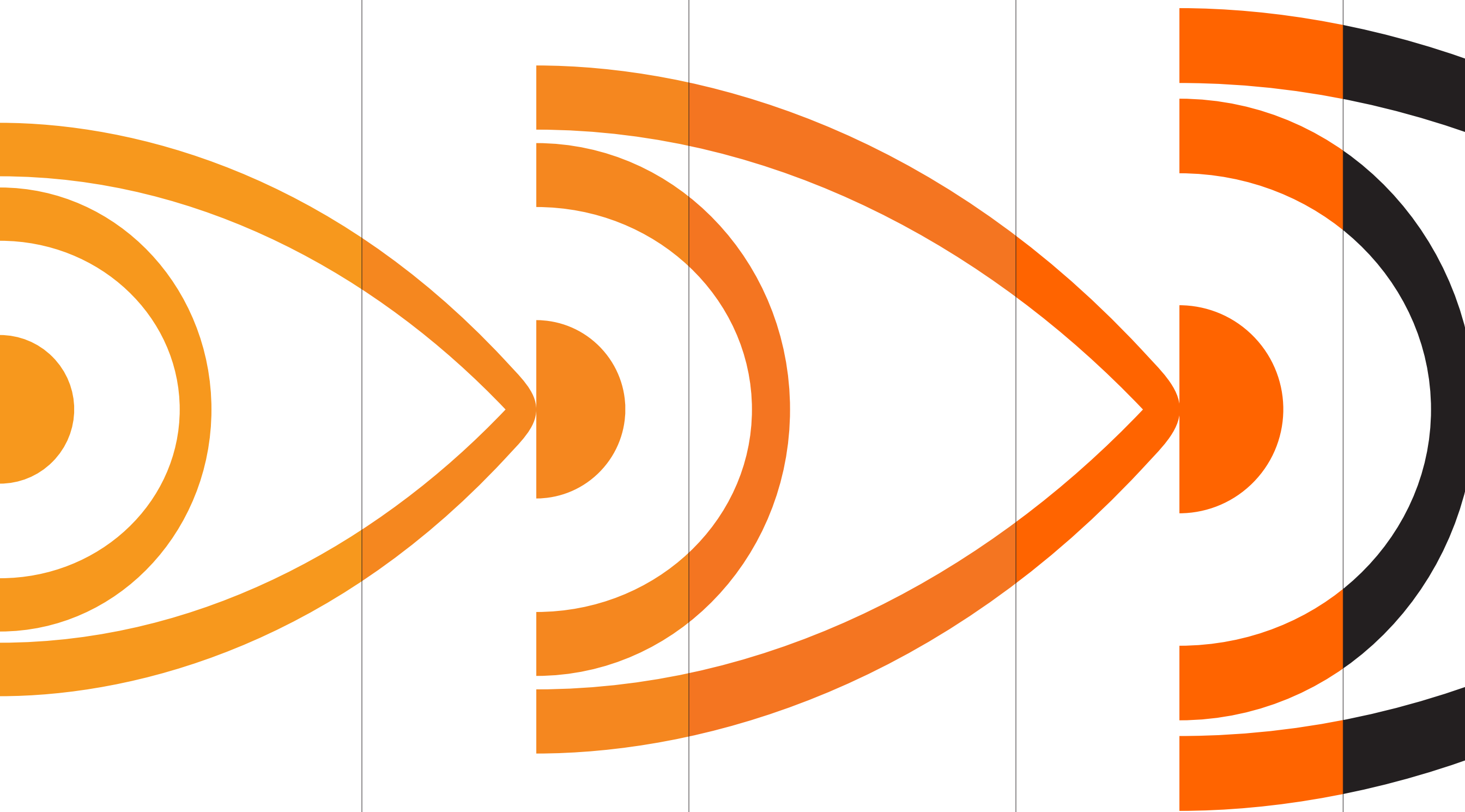
Marchildon got the idea for the project after a stint in government. In 1994 he served as Saskatchewan's Deputy Minister of Intergovernmental Affairs, and then Cabinet Secretary and Deputy Minister to the Premier. Then in 2001 he was pulled into the legendary Romanow Commission, helping to lead one of Canada's most momentous efforts to improve Canada's healthcare system. "I didn't really know what I was getting into," he said. "It was the hardest job I ever did." He and Romanow felt under siege the whole time. But he gained the experience that is driving him forward today.

"The commission made me go down deeper into health policy, learning about the value of many different forms of evidence," he said. "Whatever your position is ideologically and from a value perspective, surely we can agree that it's important to look at, and use, the evidence already available."

His mission with the Observatory isn't particularly radical. It's an effort to create a baseline for understanding health policy. But in the current context, convincing governments to value evidence over expediency is a significant task.

So health policy is... everything?

DLSPH researchers are expanding our understanding of health policy.



Why Buying Diapers Is Health Policy

SOMETIMES RETHINKING HEALTH POLICY starts with big questions to compare across states, and sometimes it starts small, with an everyday activity that seems mundane. Consider the hospital purchasing officer trying to decide what brand of diapers or surgical gloves to buy.

That's among the things Dr. Fiona Miller, my supervisor, thinks about. But she brings a historical and comparative vision to this question, demonstrating that the most everyday activities give us insight into broader political and economic forces. Miller is leading a study of hospital procurement and sustainability, while also leading a study (on which I am working) about the political and economic context for the rise of molecular diagnostics, while also starting a centre on sustainable healthcare. She's a force. A colleague once said she represents a "critical conscience" for health policy.

Miller doesn't ask typical health policy questions, which makes sense given her background. In her early days she followed an interest in the history of eugenics and became a "reluctant historian." This has served her well, she said, since there's a lot of health policy that's historical in nature. But she was far more at home when she got to work collaboratively with other scholars in the National Network on the Environments and Women's Health. A lot of her scholarship since that time has been about how, despite their promise,

health technologies don't always serve us well. But her current work on hospital procurement is bringing her back to that early work on social justice and sustainability.

Hospitals are huge purchasers of things like diapers, surgical gloves, drugs and cleaning products, but policy analysts rarely considered procurement as a potentially powerful tool in health policy. Purchasing decisions can exacerbate inequality and waste or they can be patient-centred and sustainable. Hospitals can reduce carbon emissions by choosing environmentally sustainable products, and they can also decide to purchase from companies that clearly oppose child labour in the production of medical supplies.

"What was wonderful to me about my procurement study was that I saw this positive vision," she said. "You could have a positive prescription for how health systems can have an impact on their community." It has inspired Miller to think more broadly about what it would mean to have a sustainable health system that would maximize opportunities for change on a number of fronts: environmental, social justice and economic justice.

To that end, she's starting a centre for sustainable health systems, inspired by Oxford's Centre for Sustainable Healthcare. She is drawing on examples of green hospitals and green healthcare, but with a wider vision beyond the

green, labour standards, employment and training opportunities, economic development, innovation, equity.

"We see ourselves as building on tremendous work in green hospitals, to get it to the healthcare place and get a wider sustainability vision." As someone who usually takes the role of the critic, she's excited about doing something so positive.

Miller tries to transmit this vision to her students, emphasizing the various dimensions of the health system. It doesn't just offer health services; it employs people, it produces technology and products and services, it's a supporter, promoter regulator and buyer, and it's a democratic project that helps build social solidarity.

"My research, in its tiny way, is connected to that vision of healthcare as having these health, economic and social impacts, and environmental impacts," said Miller. She wants

her students to "telescope out," to see the bigger picture. "To give them some respect for the social project — what is involved in efforts to live collaboratively."

Miller challenges students to re-imagine health policy as the wider social and political arrangements that condition health systems: "This place has a tremendous impact," she said. "We build people who do actually impact policy and practice in very specific ways, and I think it is the responsibility of policy education to get people to think very carefully about where health policy comes from."

In an era full of revolutionary promise in technology, both of these projects employ the metaphor of an old technology: telescoping out, as Miller put it — to the politics, the history, the economics of the world. And also magnifying, going deep as Marchildon put it, making real health policies that deliver equitable, sustainable health systems.



This Tent Saves Lives

People are **dying** every day due to Toronto's contaminated drug supply. DLSPH PhD student **Gillian Kolla** is fighting back.

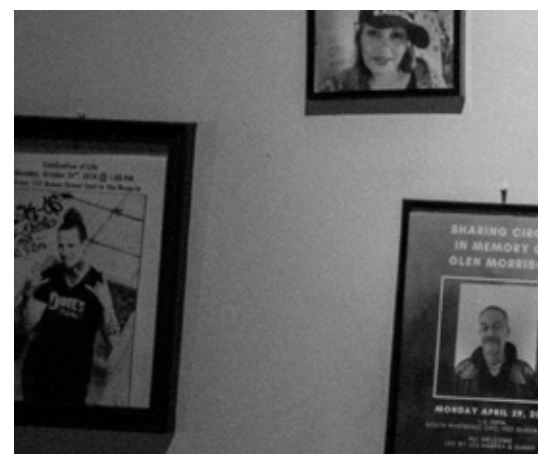
A YOUNG WOMAN WITH BLONDE HAIR and a nose ring peers curiously at the camera. A middle-aged man with grey hair leans against a tree. A young man grins.

These photographs are scattered on the memorial wall of the Moss Park Overdose Prevention Site. They represent only a fraction of the overdose deaths the Moss Park community has suffered so far this year. The overdose crisis has taken the lives of over 10,300 people in Canada in the past three years, but right now Toronto's illegal opioid supply is more lethal than ever.

In 2016, heroin began to give way to the far more potent fentanyl, and overdose deaths soared. Then, starting in January of this year, lab tests showed carfentanil, an even more powerful opioid not meant for humans, had entered the supply.

"The scale of grief and loss is terrible," said Gillian Kolla, a DLSPH PhD student who has helped save scores of lives with oxygen tanks and naloxone kits. "We don't think of people who are homeless and use drugs as having strong communities, but they do. And these communities have been devastated."

Starting in the summer of 2017, Kolla worked alongside other volunteers from the Toronto Overdose Prevention Society to open Ontario's first supervised consumption site. For 11 months, they operated unsanctioned in tents, and later a trailer, in Toronto's Moss Park, stocked with naloxone kits, oxygen tanks and sterile injection equipment. Over 150 volunteers — many of them people with lived or current experience of drug use — supervised more than 9,000 injections, and saved the lives of 251 people.



They also served on the province's Opioid Emergency Taskforce, helping the provincial government develop its model for overdose prevention sites. The following summer, by the time the Moss Park operation moved to an officially approved and funded space across from the park, eight legal supervised injection and overdose prevention sites were already operating in the city.

Kolla, a 41-year-old mother of two young children, is a fierce advocate for street-involved drug users. Her current research examines the delivery of harm-reduction services to people who use drugs by meeting them where they live and use drugs, aiming to improve their health in the process.

"Gillian is unique in how she has blended her skills as a service provider, academic researcher and advocate," said her PhD thesis supervisor, Professor Carol Strike. "She's amongst the talented few with the skills and credibility to truly partner with people who use drugs to address issues like overdose, criminalization of drug use and housing that impact their lives."

Kolla has been working with people who use drugs for over a decade, starting in Montreal with homeless and street-involved youth. She moved to Toronto to work on her master's degree in public health at DLSPH in 2007, and began her PhD a few years later. When the overdose crisis hit, Kolla was doing field research on a novel harm-reduction program that delivered education and equipment directly in the spaces where people gather to use drugs. She saw firsthand the increased overdoses caused by the contamination of heroin with more potent opioids like fentanyl.

“It was the tent”

IN THE FALL OF 2016, WHEN OVERDOSE-RELATED deaths started climbing across Canada, Vancouver activists opened the first guerilla overdose prevention site by erecting a tent in an alley. The following summer, after years of frustration trying to open supervised injection sites in Ontario, Toronto activists decided they didn't need anyone's permission to save lives, either. They formed the Toronto Overdose Protection Society (TOPS), bought a few tents and set up in Moss Park.

“We didn't know it at the time, but Toronto Public Health released data months later showing we opened the tents at the epicentre of the city's overdose crisis,” said Kolla, who is a member of the coordinating committee for TOPS and was responsible for compiling usage data. “In our very first month in the park we reversed 15 overdoses, in only 18 days. And it just continued from there.”

Community members who spent time in the park helped with tent setup and takedown every day. Cuz, a 45-year-old man originally from Nova Scotia, pitched in regularly.

At the time, Cuz was overdosing and ending up in the hospital frequently. Once he was in a coma for a week. With fentanyl, he said, there's no way to know what you're getting. It scared him to think of the girl he watched overdose

faster and harder than anyone he'd ever seen after injecting just \$2 worth of it.

Cuz began hanging out at the site, and started to use in the tent. He spent time learning about safe injection practices, but also enjoying the feeling of safety — knowing he was not going to die or be arrested in that moment.

For Cuz, the sense of community in the tents felt healing.

“It's the love, the caring, and all the little things,” he recalled. “There was nothing those guys wouldn't do for me. It was the tent — I didn't know it at the time, but I knew I was excited. They say it takes a village. When the first tent opened up out here, that was the first time it felt like a village. There wasn't a sense of community for me until then.”

Said Kolla: “There was something so special about being in the park. People were bringing food, hanging out and chatting in front of the tents. It was really powerful and it fostered a sense of community that has continued to this day.”

Today, Cuz still uses fentanyl, but he's careful to follow safe injection protocols, and to take care of himself by eating and most importantly getting enough sleep. He fears death a lot less.

He volunteers at a downtown supervised consumption site, enjoys his son and new baby granddaughter, and is thinking about starting a roofing company that could employ drug users able to do strenuous work.

“When you feel like you're making a difference you don't want to stop that,” he said. “You're creating happiness, safety and nurturing. I took myself out of a certain crowd and saw that each time I helped out, things got better for me.”



Cuz, at a safe consumption site in downtown Toronto

“People cared whether they lived or died.”

OVERDOSE PREVENTION SITES ARE ABOUT saving lives first and foremost. And yet during her Saturday-night shifts in the Moss Park tents, Kolla found herself constantly on the phone, trying to find people spots in shelters, helping them get into detox or connected to other social services.

“Research shows that people who use supervised injection sites are more likely to access treatment than those who don't use these services,” she said. “But it's important that treatment is not seen as the goal. When people are forced into treatment it's much less effective than when they choose to go on their own.”

She believes the tents sent a powerful message that the community “cared whether people who use drugs lived or died. And there was much more community support than we anticipated. If we tweeted that it was hot out and we needed more water, cars would pull up with bottles of water. Union members helped us get a trailer in the park and then wire it for electricity so we could stay warm through the winter. Neighbours donated food and we raised a lot of money on GoFundMe.”

Even law enforcement have been largely supportive, Kolla recalled. “Police see the deaths. They've even tweeted out drug warnings and advised people to use supervised consumption sites,” she said. “There has been a sea change in the way they relate to harm reduction. It's amazing how far they've come.”

Jen Ko, the nurse who co-coordinates the Moss Park Overdose Prevention Site, got her start as a volunteer in the park. “My experience was really transformative,” she said. “In health-care, there's a lot of lip service to being patient-centred. This was radical health-care. It felt like such a privilege to be in this space.”

Today, there are nine supervised consumption sites in Toronto, but people are still dying when they inject at home, at night, or in places like Scarborough and Etobicoke that are far away from the downtown core, where most of the services are located.

The next frontier in harm reduction, Kolla said, is advocacy for the decriminalization of drug use, and the establishment of safer supply programs.

“Criminalization is negatively impacting how quickly we are responding to the overdose crisis,” she said. “Right now, the drug supply is very dangerous, and there's no way to get around this unless we get a safer supply to people at risk. And this isn't something that can happen in a small pilot project: we are seeing catastrophic death rates. We need to roll out safer supply in big cities and small towns — and we need to roll this out yesterday.”



Gillian Kolla, in front of the needle drop box in Moss Park at Sherbourne and Dundas streets, the epicenter of Toronto's overdose epidemic



Beyond Facts

Vaccine hesitancy is rising, mirroring historically low public trust in institutions. DLSPH is uniting the scientific community to tackle the fear and misinformation.

STORY BY Elaine Smith
ILLUSTRATION BY Mariel Rutherford

WHEN A GRADE 8 STUDENT IN BRAMPTON requested a mature minor's exemption from receiving the HPV vaccine earlier this year, a conversation with one of the local public health nurses assuaged his fears and allowed him to feel comfortable about being immunized.

"I find that having a conversation before someone gets an exemption can allay unfounded fears of side effects," says Dr. Lawrence Loh, associate medical officer of health for the Regional Municipality of Peel and adjunct Professor at DLSPH. "The public health nurse was very empathetic and it really came down to understanding his fears and concerns and what his information about the vaccine had been."

At the Hospital for Sick Children's immunization clinic, Dr. Shaun Morris, an infectious diseases specialist and DLSPH Professor, regularly talks to families who are hesitant about having their children vaccinated.

"The large majority of people struggle due to so much contradictory information and find it hard to tease out what's wrong and what's right," says Morris. "A lot of people hear anecdotal evidence or turn to social media and are struggling to make the best choice to keep their kids healthy."

"The healthcare system hasn't done a very good job of disseminating information, and because vaccines are so successful, most of these people haven't seen these diseases

firsthand," he adds. "They aren't militantly opposed — they just need someone with the time to help them deal with their concerns. Those who actually come to us are much more comfortable proceeding with immunization."

"We're not debating whether the Earth is flat anymore"

Enter the team from DLSPH's new Centre for Vaccine Preventable Diseases, which includes Morris, Loh, Director and DLSPH Professor Dr. Natasha Crowcroft, and Associate Director Dr. Jeff Kwong. The Centre will catalyze cutting-edge research and education that maximizes the health benefits of immunization for everyone.

The Centre, the first of its kind in Canada, will draw on the expertise of academic researchers, educators and public health advocates to advance vaccine science at home and abroad. A very important one is to address vaccine hesitancy by promoting the science behind immunization and becoming a trusted source of knowledge on immunization and vaccine-preventable diseases.

"I think that almost anyone who reads the news notices something about vaccine hesitancy almost every day," says Crowcroft, also adjunct scientist at IC/ES and Chief of Applied Immunization Research and Evaluation at Public Health Ontario. "The people who are anti-vaccine have very loud voices. Those of us on the scientific side, meanwhile, believe we have truth on our side, so we don't think we have to make much noise. We need to get better at explaining the work we do, that people need vaccines and why they are important."

For a long time, she notes, media stories about vaccines tended to be neutral instead of proactive.

"This idea of balance was a mistake, because no scientist questions whether vaccines are good," says Crowcroft. "We've answered the question — they're safe and efficient. We're not debating whether the Earth is flat anymore."

Influencing media coverage will be key — but only part of the picture. Surveys show declining public trust in media, science, government, politicians and many other institutions — and a third of parents believe the science behind vaccines isn't quite clear. In that vacuum, social media networks have become more powerful influencers for spreading misinformation.

"The people who are anti-vaccine have very loud voices"

"The University of Toronto is in a unique position to help address the issue of misinformation about science because it has world-leading researchers who are interested in immunization and whose expertise spans from basic laboratory science, including immunology, through data scientist and artificial intelligence experts, to social and clinical researchers," says Crowcroft. "It is not possible to list all the researchers who have stepped forward enthusiastically to become involved, and they are impressively collaborative in a way that does not often happen across such different domains."

She believes the Centre will stand as a safeguard against misinformation and will be trusted because "I think researchers are seen as people who are in pursuit of truth and not vulnerable to what the politicians of the day think. We are accountable to our peers for accuracy and don't let each other off the hook."

Vaccine hesitancy can also extend to health providers. Another goal is to ensure that U of T students training as nurses, physicians, social workers, speech-language pathologists, physiotherapists and occupational therapists champion vaccines and the science behind them. And they need the right tools to answer questions and address concerns.

"So much of the discussion about what to do about vaccine hesitancy has happened at the managerial level, but primary care workers who are administering the needles are critical," says Morris. "We need to understand the barriers they face and determine how we can do things better."

Measles Knows No Borders

INTERDISCIPLINARY RESEARCH WILL ALSO BE A KEY PIECE OF THE Centre's puzzle — especially that which forges new partnerships, insights and research domains to maximize innovation and impact around the world. To do this, the Centre will draw on U of T's already deep connections to the global public health community. DLSPH Professor Shelley Deeks is a member of the Centre and also serves on the WHO's polio expert group. And another Centre member, DLSPH's Professor Erica Di Ruggiero, brings the lens of global health systems and governance.

U of T's Connaught Fund and Toronto Public Health are among the partners in the Centre's endeavours.

"We really want to influence what the field is doing and make the research very applied," Crowcroft says. "The Connaught funding is looking at the burden of pneumococcal disease in seniors and how we can improve the quality of life through immunization in an aging population. U of T Professor Aaron Wheeler, Dr. Shelly Bolotin and Dr. Sarah Wilson are doing work on measuring immunity and vaccine coverage, respectively. "When it comes to ethics, we'll want to look at topics such as public perceptions of how we work with industry and how we manage the academic-industry relationship."

Adds Crowcroft: "There are lots of questions we can ask to strengthen the immunization system and also to have a global impact. Our work crosses into so many areas — Indigenous and global health and health systems, for example — it's so diverse and very exciting."

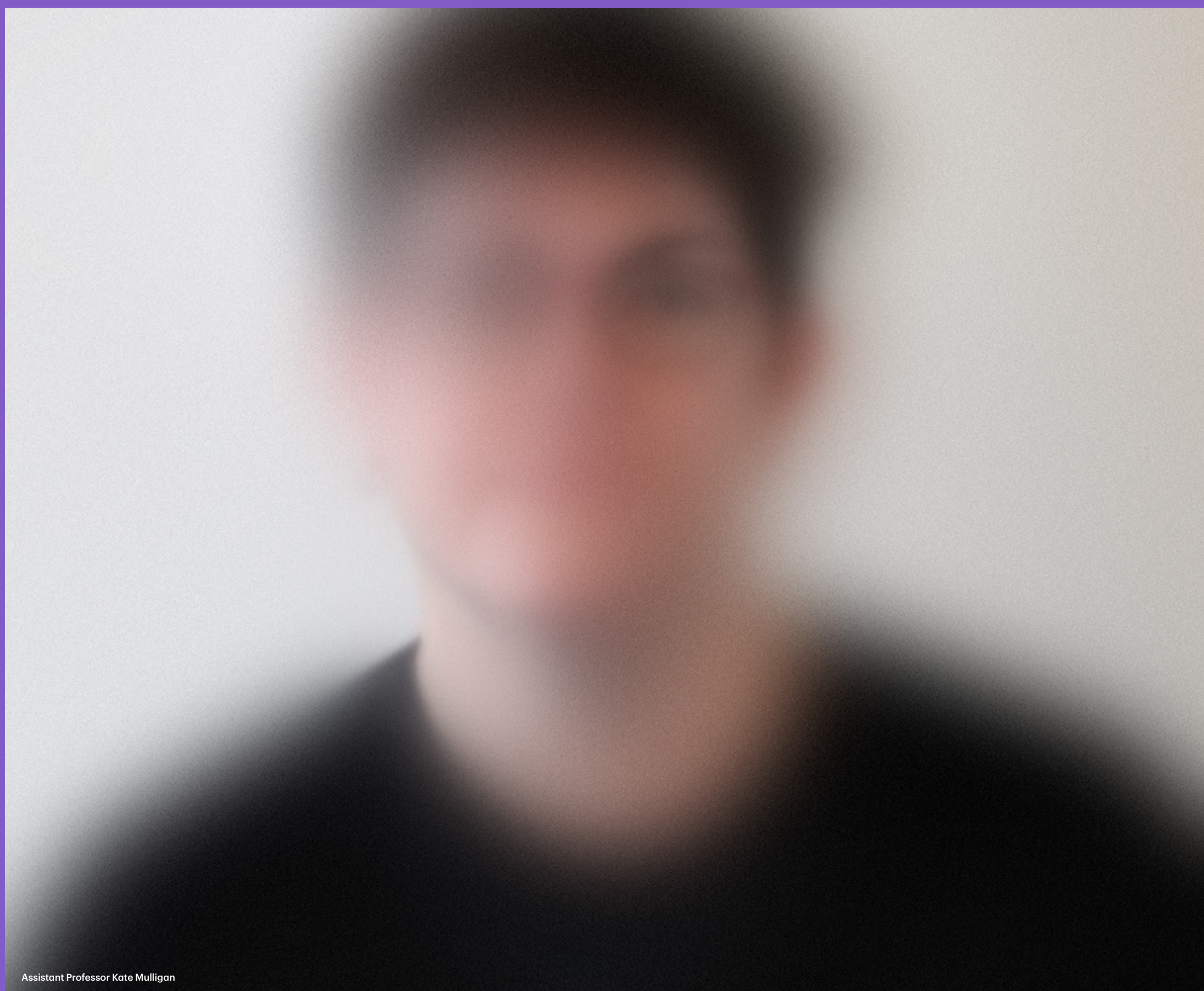


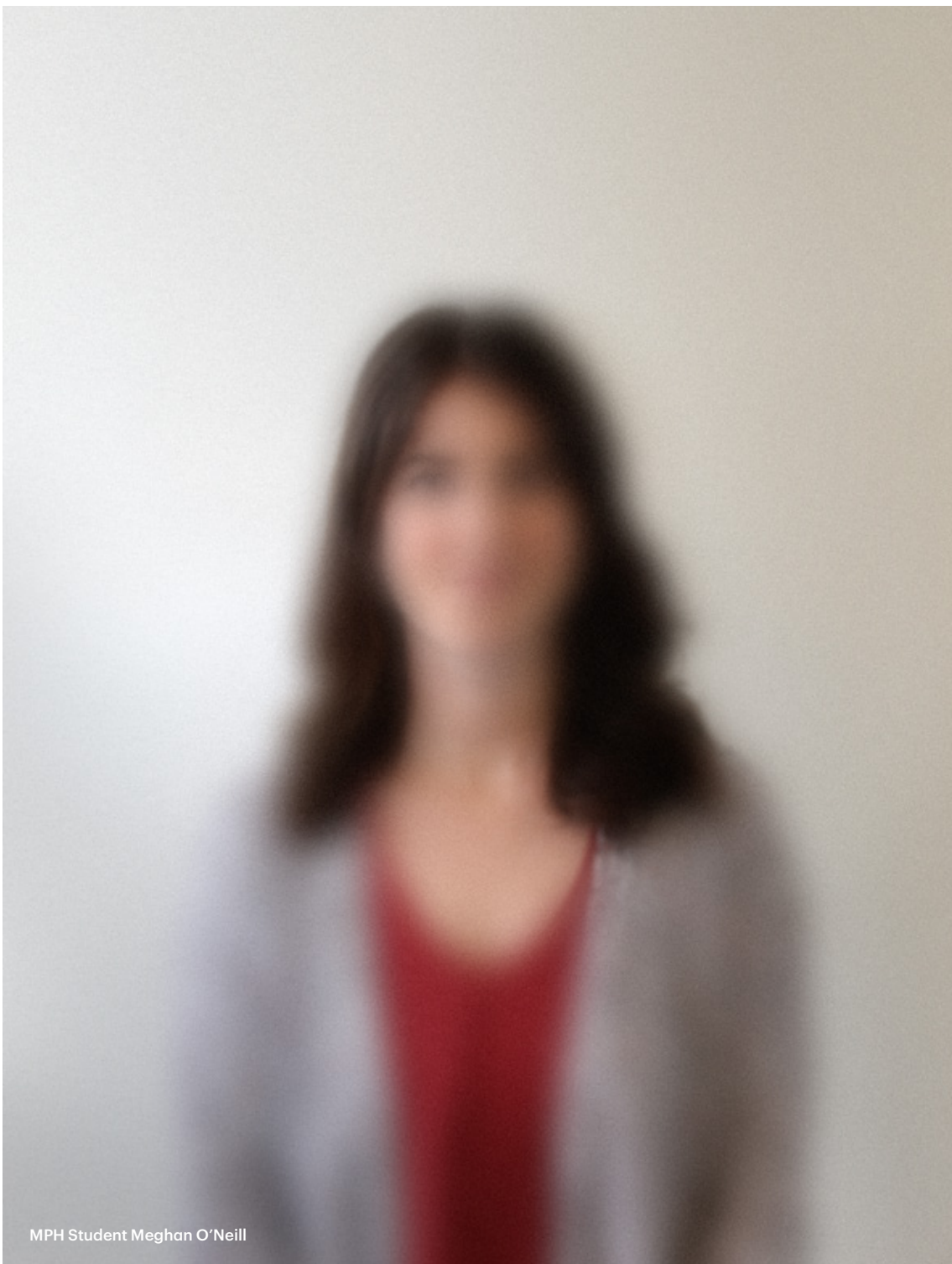


Social isolation is growing, and emerging as a profound risk factor for many medical conditions. DLSPH is working to turn the tide.

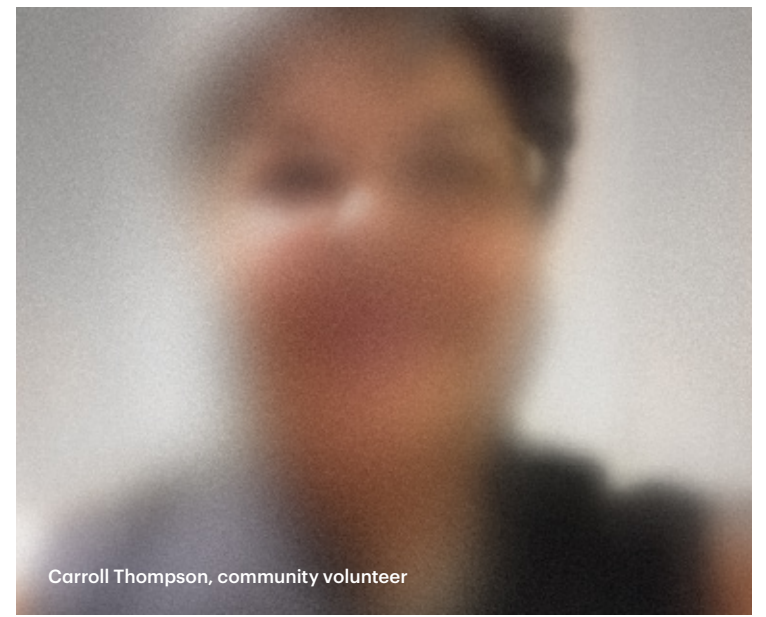
The Loneliest Disease

STORY BY
Françoise Makanda





MPH Student Meghan O'Neill



Carroll Thompson, community volunteer

CARROLL THOMPSON EAGERLY ANTICIPATED HER early retirement and a break from the demanding deadlines of an accountant. An extrovert, she felt no qualms about moving from Toronto to the small community of Wasaga Beach. Five years later, she was surprised to realize that she was feeling isolated.

The community had a lot to offer, but she realized integration wasn't easy.

"If you are hesitant in any way to reach out, your sense of isolation can be more pronounced," said Thompson, 66. "I am a visible minority, and when we first got here it took me longer than I had anticipated to feel comfortable with finding, and participating in, the offerings that create a sense of connectedness and community."

A chance conversation when visiting the South Georgian Bay Community Health Centre made her aware of a new pilot project on social isolation called Rx Community: Social Prescribing. Launched by DLSPH Assistant Professor Kate Mulligan, the initiative treats loneliness like a medical condition and encourages doctors and nurse practitioners to prescribe activities like dance lessons, cooking classes, volunteer gigs, single parent activities and bereavement groups.

Thompson was intrigued by the premise of the pilot project, which sought to match volunteer contributions with the needs of the client community. She was particularly struck by the concept that pairing community needs and services could be a more

Isolation has the same impact on health as smoking 15 cigarettes a day

efficient use of medical resources that are in growing demand. The opportunity evoked both her innate social conscience and her professional expertise. Thompson gladly offered to volunteer.

"The healthcare system hasn't known how to intervene in social determinants of health," said Mulligan. "Our model addresses that, with a focus on social isolation."

With social prescribing, clinicians refer clients to a range of non-medical and non-clinical services to address their overall wellbeing. The practice, which has taken off in the UK, is becoming a way to tackle social isolation with the seriousness it deserves — and with the gravitas of a prescription pad.

Social isolation is the condition of being disconnected from friends, family, social groups and support from the wider community. Research shows that people who remain isolated for a long time are more likely to face serious mental health issues like depression or addiction. But there are physical consequences as well. Isolation has the same impact on health as smoking 15 cigarettes a day. It can be twice as deadly as obesity and diabetes. It also increases the risk of dementia by a factor of 64.

Researchers who study the social determinants of health

have long acknowledged the causal link between economic prosperity and good health, but with a rapidly ageing population, the rise of technology and the subsequent shift in the way we socialize, it's becoming increasingly clear that loneliness is a serious medical condition.

When she first joined Rx Community, Thompson volunteered to help socialize an elderly woman in early dementia whose worried daughter worked nights and felt helpless to do more. One day, the pair played Euchre, laughing and making up rules as they went well beyond their scheduled appointment time. The next day, the daughter wrote to Thompson: "I can't tell you how it makes me feel to hear my mother laughing. Thank you!"

Good for the Bottom Line

IN ADDITION TO PARTICIPATING IN RX COMMUNITY, DLSPH researchers and students are also confronting the problem of social isolation at the health policy level, contributing to the landmark report, "Connected Communities: Healthier Together." Released in February by the Chief Medical Officer of Ontario, the report found loneliness knows no bounds.

"We may think that more money will increase life satisfaction, but that isn't always the case. Life satisfaction increases as income increases to a point of attaining basic material needs and then it drops off as money increases. The literature says that people who are socially connected have less chronic disease and are more satisfied with their lives," said Meghan O'Neill, one of the three Master of Public Health students at DLSPH who analyzed data for the report.

The report found that Ontarians who are more connected to their community enjoy better mental health, eat healthier, are more physically active and make fewer visits to their healthcare provider. People who reported a poor sense of community belonging are more likely to be isolated and have a higher likelihood of being among the province's top five percent of high medical resources users.

Tackling loneliness, the report suggests, could be good for Ontario's bottom line. The authors also noted a worrisome trend: younger people report lower community connection and they volunteer less. Not surprisingly, the literature suggests that technology is a major culprit.

Understanding What Makes Us Happy

MEDICINE MAY BE WAKING UP TO SOCIAL ISOLATION, BUT THE DATA have always been readily available, said Laura Rosella, a DLSPH epidemiologist and expert in the use of Big Data and artificial intelligence for public health. Because we lacked an understanding of the ties between isolation and health, Rosella said, physicians and researchers haven't monitored it until recently.

"We work a lot with routine health surveys and we did a lot of studies in life satisfaction and its impact on health, but in the last

five years, we only just started exploring community-level variables that have to do with how people feel and what makes them happy," said Rosella, who worked with her students to analyze data for the study.

Another DLSPH faculty member who took part in the report, Professor Suzanne Stewart, Director of the Waakebiness-Bryce Institute for Indigenous Health, said it's important to approach social isolation from a philosophical vantage point.

"The more research and recommendations that show our commonality, the more it will help us, because it's exactly those divisions that have created the ill health of individuals and societies," she said. "We need to focus on what brings us together, not what divides us."

The report, Stewart said, demonstrates a paradigm shift from a Western biomedical view of public health to other ways of understanding what health and healing means.

The Rx Community project has a similar philosophy to healing loneliness. "What would it look like for the healthcare system to see a patient as a whole person, instead of focusing on just their medical diagnoses?" asked Mulligan. "What makes people healthy isn't just genetics and lifestyle choices. Good clinicians know this but need a trusted system to turn to for the issues their clients face that are outside their expertise, time or mandate."

The Chief Medical Officer of Ontario's office is now connected to Professor Mulligan and her Rx Community project, which is active in 11 community health centres in diverse parts of the province.

Mulligan hopes to track the pilot's progress through shared medical records. Mainly, she wants to see whether the intervention has reduced key markers of poor health outcomes.

"Clinicians don't need to be experts in the social determinants of health, but they need support to help these patients. After the pilot project, we want to check — in the long run — if the project has an effect on their medication use and their self-reported sense of belonging," she said. "Providers can then focus on the clinical side of the patient's health."

The pilot project's early findings, although anecdotal, are promising.

"People are feeling great and excited," she said. "I had a couple of men offer to play music in a waiting room. One client who drives trucks for a living started a knitting group. Another person got her first part-time job in 15 years. She had been living with mental health issues for quite some time but she built her confidence. Working with the heart is the next frontier for the future of work."



Rembrandt van Rijn,
The Anatomy Lesson of Dr Nicolaes Tulp,
c. 1632

STORY BY
Rebecca Biason

ARTWORK COURTESY OF
Mauritshuis, The Hague

The Quiet Revolution

THE HEADLINES CAPTURE OUR IMAGINATIONS WITH a future of robot surgeons, but there's a much less glamorous, and probably more profound, use for artificial intelligence in healthcare — and DLSPH researchers are at the helm.

Complex algorithms can help redesign the way we provide care and spend our healthcare dollars, from apps to neural networks and predictive tools.

The possibilities are staggering. Imagine a healthcare delivery system so flexible and efficient that patients receive preventative care for diseases before they truly emerge. Or one that allows people with chronic diseases, who are currently cycling through the hospital, to manage their own care from home.

The creation of a health system able to constantly reinvent itself based on new disease threats, disasters and changing population health could alter our entire perception of healthcare.

That's the golden vision. But there's a flip side: Thoughtless and unplanned innovation could leave patient care and the health system as we know it in shambles.

"The trend towards artificial intelligence and innovation in the healthcare sector is surging ahead. But without a strategy, patient partnership, or guidelines around data use, attempts to implement these revolutionary changes into our health system will fail," said Rhonda Cockerill, Interim Director of the Institute of Health Policy, Management and Evaluation (IHPE) in the Dalla Lana School of Public Health.

First Attempts

EXPERTISE IN BIG DATA AND BIOSTATISTICS, HEALTH INFORMATICS policy and bioethics runs deep at DLSPH. Many of our students and faculty are helping to navigate the complexity and risk involved in turning these innovative ideas into practice.

"Some of the issues affecting AI innovation in healthcare is that while the idea or product may be a good idea, there is a real difficulty in translating that innovation into something that will help patients," said Emily Seto, an Assistant Professor at IHPME and a lead researcher behind the implementation of Medley, a health app for chronic disease management.

Medley is an early attempt to model a future AI application, and so far it's proving effective. It uses an algorithm to provide heart-failure patients with real-time feedback about their symptoms based on data they input such as blood pressure, heart rate and weight. While the app relies on data, it doesn't currently use artificial intelligence — and with good reason.

"Eventually we could incorporate machine learning and AI into Medley and use it as a predictive model to identify heightened risks for certain patients," said Seto, "but predictive technology isn't helpful unless you have a structure in place to help those patients."

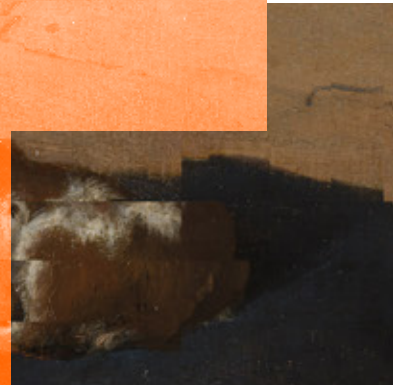
Seto is researching ways to build that structure as she examines the cost effectiveness of digital health technology innovations like Medley. By keeping patients out of hospitals, the goal of many digital health technologies is to ease the strain on resources in the health system, save money and improve patient care.

Sounds like a perfect way to help solve our healthcare problems, so why isn't every hospital eagerly seeking to launch their own health app program?

First, researchers need to determine that it works.

"It's really about the implementation of an entire program, not just about evaluating the technology on the screen," said Patrick Ware, who completed his dissertation under Seto's

DLSPH researchers are helping to transform the future of health delivery with artificial intelligence.



Jan Steen, *The Sick Girl*,
c. 1632

supervision at IHPME, and who also works on Medley. "You need to look at the services and how they work together with the technology, to make AI and digital health innovation a reality."

Ware has been evaluating how successfully Medley has been implemented as part of the standard of care at University Health Network (UHN) among heart-failure patients. When used correctly, it should take a patient no more than a minute to complete a check of their symptoms and key physiological measures using the app on their smart phone.

If, based on their measurements, there are signs of a patient's weight increasing, or they are holding fluid, a common treatment response from the app might be to instruct a patient to take a diuretic to release that fluid. Clinicians are still alerted by the Medley system when a patient's symptoms or measurements require follow-up, but supporting self-management is equally important.

While Medley has so far proven to be a successful program at UHN, Ware is quick to point out that scaling up the program to span across the health system requires additional buy-in from patients and clinicians alike.

"You need patients to input their data regularly in order for the program to work. If patients are not using it regularly, then this kind of digital innovation is not an optimal use of public money," said Ware.

Most patients are actively involved in updating their data in the app at the start, but it is difficult to rely on them to monitor themselves without support from clinicians.

"Additional barriers to scaling up a program like this are closely tied to the potential disruptions to existing clinician workflow and compensation," added Ware.

The current healthcare system has not been set up to compensate clinicians effectively in this model, so finding ways to encourage them to adopt digital health programs can be a bit of a balancing act for researchers.

"If a digital monitoring system is set up for 24/7 reporting, clinicians might be worried about getting alerts in the middle of the night, adding to their workflow," explained Seto. "In order for a lot of these programs to be successful there needs to be some type of cost benefit for clinicians taken into consideration as well as the necessary infrastructure to support it."

Stakes Are High

WHILE COST EVALUATION IS JUST ONE OF THE BUILDING BLOCKS in the foundation of AI innovation, there is even more at stake when our researchers take a deep dive into the ethics of data and AI in healthcare.

"We are in the midst of a massive data explosion right now that is taking hold everywhere," said Professor Michael Escobar, a biostatistician in the Dalla Lana School of Public Health. "Twenty years ago, to conduct an epidemiology study you would need to drive around the GTA, find people to interview and use in your data set, if you were lucky, you might get 600 people. Now, you can easily obtain data for a quarter of a million people."

The ease of accessing more data is like a gold mine for researchers like Escobar. He uses data to help find patterns that could help predict and prevent the occurrence of disease and other life-altering incidents such as traumatic brain injuries. But by using an algorithm to identify people most at risk, Escobar also worries about how this kind of data-driven work might be used to stigmatize people.

"Data are often being used to influence business decisions, and even in healthcare there is a real threat that this data might be misused to deny people insurance, for example, or influence court cases," said Escobar.

This kind of ethical dilemma is why Professor Jennifer Gibson, Director of the Joint Centre for Bioethics at DLSPH, advocates for proper governance, and consideration of the public's trust when it comes to artificial intelligence in the healthcare landscape.

"Most Canadians want to see more virtual care and AI in their health system through mobile apps or wearable devices, but they are also worried about privacy and the loss of human contact," said Gibson. "Right now, the health system holds a great deal of public trust, but that is a steep hill to fall from if we don't get this right."

Researchers warn that the commercialization of data and health technology is powerful for businesses. Wearable consumer devices that do something as simple as track your daily step count could eventually have machine learning built right in, learning and evolving from your own health data while it remains stored by a profit-driven company.

"That's why we need regulatory structures in place, not just for privacy but for accountability," said Gibson. "When an algorithm gets a diagnosis wrong, for example, who will be accountable for that?"

Gibson's recently launched course, Ethics and AI in Health, asks graduate students to consider the speed of technological advances and the subsequent need for sound public policies that address these ethical dilemmas in our health system.

"I tell my students that I prefer to say 'augmented intelligence' because AI is still a human enterprise. These machines are not decision makers," said Gibson. "Patient perspectives and patient goals will continue to be integral to their advancement throughout the healthcare system and we can help lead that charge."





DLSPH at a Glance

To learn about how you can support the Dalla Lana School of Public Health please contact

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To share your feedback about the 2018-19 Annual Report, please contact

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85 Core Faculty /
73 Cross-Appointed Faculty /
20 Post-Doctoral Fellows /
745 Master's Program Students /
319 PhD Program Students

*AS OF APRIL 2019

DLSPH is the largest and most comprehensive public health school in Canada and is ranked among the top 10 in the world.

Faculty

664 Status-Only /
210 Adjunct / 11 Canada
Research Chairs /
9 Promoted to Professor /
2 Promoted to Associate
Professor

Staff

39 Research
(Appointed and Associate) /
50 Administrative
Appointed and 15 Casuals /
37 Post-Doctoral
(Employees and Trainees) /
155 Research (Casual)

Annual Research Funding

\$40,421,058

Total Funding, U of T and Affiliated Institutions

\$12,656,035
Three Councils

\$2,228,166
Institutional Initiatives

\$1,868,343
Corporate

\$9,868,367
Government, Other

\$13,800,147
Not-for-Profit

12%

INCREASE FROM 2017-18

21%

INCREASE FROM 2016-17

September 2018 Intake

Public Health Sciences
(PHS)

PhD

90

Applications

22

Offers

22

Registration

MPH

739

Applications

221

Offers

137

Registration

MSc

79

Applications

24

Offers

9

Registration

MScCH

51

Applications

36

Offers

28

Registration

MHSc

18

Applications

15

Offers

11

Registration

Institute of Health Policy, Management and Evaluation
(IHPME)

PhD

91

Applications

43

Offers

36

Registration

MSc

313

Applications

135

Offers

115

Registration

MSHc

145

Applications

46

Offers

46

Registration

MHI

255

Applications

75

Offers

70

Registration

Academic Year 2018–2019

*INCLUDES THE AVERAGE OF THE FALL 2018 AND WINTER 2019 AVERAGE

PHS

PhD

131

MPH

272

MSc

40

MScCH

64

MHSc

22

IHPME

PhD

187

MSc

347

MHSc

78

MHI

106



Annual Report 2018–19

Dalla Lana
School of Public Health



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