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CIHR-SUPPORTED RESEARCH WORKING TO CREATE A HIGH-QUALITY, ACCESSIBLE AND SUSTAINABLE HEALTH CARE SYSTEM

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GATHERING MORE EVIDENCE

FUTURE RESEARCH INITIATIVES TO SUPPORT A HIGH-QUALITY, ACCESSIBLE AND SUSTAINABLE HEALTH CARE SYSTEM

NEED MORE EVIDENCE?

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All people profiled in this newsletter have agreed to their appearance in it and approved their individual stories.

WELCOME TO THE THIRD ISSUE OF *SHOW ME THE EVIDENCE*

What makes a strong, sustainable health care system? Attention to patients and their families; a focus on proven, cost-effective treatments; concern for the well-being of health care workers; and a willingness to collect and use research evidence to improve service delivery.

The Canadian Institutes of Health Research (CIHR) is the Government of Canada's health research investment agency. CIHR provides support for investigator-driven health research, but also sets strategic investment priorities to respond to key health and health system challenges. CIHR has established five research priorities for the organization and health research across the country:

- Enhance patient-oriented care and improve clinical results through scientific and technological innovations.
- Support a high-quality, accessible and sustainable health care system.
- Reduce health inequities of Aboriginal people and other vulnerable populations.
- Prepare for and respond to existing and emerging global threats to health.
- Promote health and reduce the burden of chronic disease and mental illness.

Show me the Evidence showcases some of the evidence being produced by Canadian health researchers in response to the challenges listed above. In this issue, we report the progress of several researchers who are helping support a high-quality, accessible and sustainable health care system. In Canada and around the world, their research is making a difference. These stories highlight:

- a new tool to protect health care workers in developing countries from workplace exposure to infectious diseases and other health threats;
- an innovative program that has drastically altered the service delivery model used to diagnose and treat dementia patients in rural communities; and
- a new approach for systematically improving the level of care provided to newborns admitted to neonatal intensive care units.

These CIHR-funded research projects have delivered:

- **A 30% REDUCTION IN HOSPITAL-ACQUIRED INFECTIONS;**
- **A MODEL OF CARE USED INTERNATIONALLY;**
- **A TOOL TO PROTECT HEALTH CARE WORKERS; AND**
- **DIAGNOSIS AND TREATMENT PLANS FOR DEMENTIA IN A DAY, NOT A YEAR.**

RISKY BUSINESS: KEEPING ONE OF THE WORLD'S KEY WORKFORCES SAFE AND HEALTHY

New tool to protect health care workers

AT A GLANCE

WHO: DR. ANNALEE YASSI, UNIVERSITY OF BRITISH COLUMBIA

ISSUE: HEALTH CARE WORKERS ARE IN DAILY DANGER OF EXPOSURE TO BIOLOGICAL AGENTS THAT CAUSE ILLNESS AND DEATH. BUT STANDARDS FOR PREVENTING INFECTION VARY WIDELY, AND NOW DRUG-RESISTANT TB POSES A MAJOR THREAT TO HEALTH CARE WORKERS IN DEVELOPING COUNTRIES.

PROJECTS: DR. YASSI LEADS SEVERAL RESEARCH PROJECTS AND KNOWLEDGE TRANSLATION EFFORTS TO IMPROVE INFECTION CONTROL IN NORTH AMERICA, CENTRAL AMERICA, SOUTH AMERICA AND AFRICA, INCLUDING THE DEVELOPMENT OF POSTGRADUATE PROGRAMS IN INFECTION CONTROL IN ECUADOR AND A FIVE-YEAR CIHR-SUPPORTED INITIATIVE TO REDUCE THE BURDEN OF HIV/TB INFECTION AMONG HEALTH CARE WORKERS IN SOUTH AFRICA.

RESEARCH EVIDENCE: DR. YASSI AND HER COLLEAGUES DEVELOPED A WEB-BASED MONITORING TOOL CALLED OHASIS (OCCUPATIONAL HEALTH AND SAFETY INFORMATION SYSTEM) THAT TRACKS INCIDENTS, EXPOSURES, RISK FACTORS, IMMUNIZATIONS, INJURIES AND DISEASES OF HEALTH WORKERS. THE TEAM ALSO CREATED INTERACTIVE TRAINING MODULES TO TEACH HEALTH CARE WORKERS ABOUT INFECTION CONTROL PROTOCOLS.

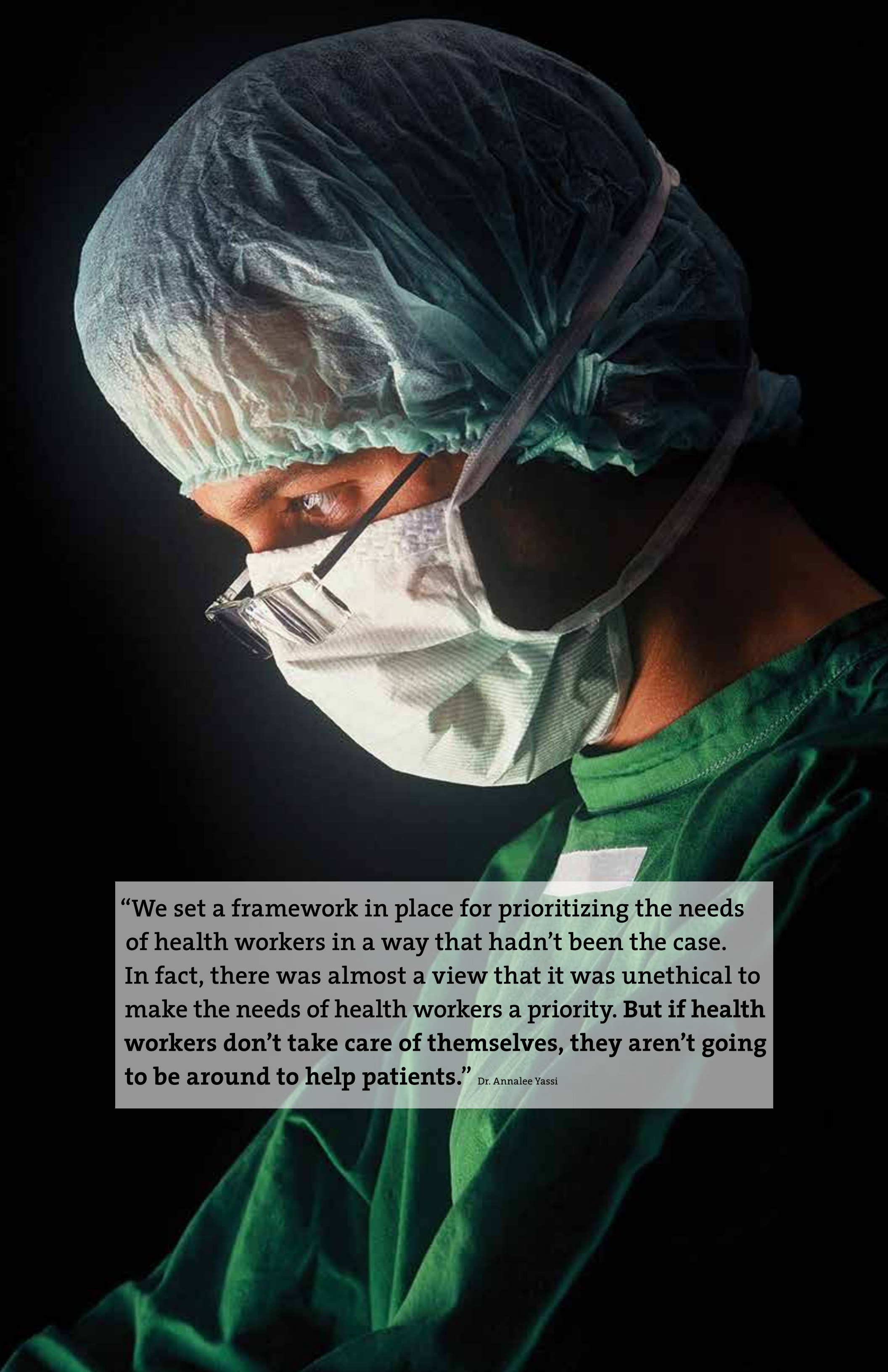
EVIDENCE IN ACTION: OHASIS IS OPERATIONAL IN SOUTH AFRICA AND IS BEING MADE AVAILABLE TO HOSPITALS IN THE UNITED STATES. ECUADOR IS IN THE PROCESS OF IMPLEMENTING IT, WHILE SPAIN, COLOMBIA AND GHANA HAVE EXPRESSED INTEREST. DR. YASSI ALSO CO-AUTHORED THE DRAFT GUIDELINES TO IMPROVE HEALTH WORKERS' ACCESS TO HIV AND TB PREVENTION, TREATMENT, CARE AND SUPPORT PUBLISHED IN 2010 BY THE WORLD HEALTH ORGANIZATION, THE INTERNATIONAL LABOUR ORGANIZATION AND UNAIDS.

SOURCES: COLLABORATION BETWEEN INFECTION CONTROL AND OCCUPATIONAL HEALTH IN THREE CONTINENTS: A SUCCESS STORY WITH INTERNATIONAL IMPACT, *BMC INTERNATIONAL HEALTH AND HUMAN RIGHTS* 11 (SUPPL 2):S8 (2011): DOI:10.1186/1472-698X-11-S2-S8.

Front-line health care is a risky business. With almost 30 million physicians and nurses/midwives¹ and more than 59 million people employed at clinics,² health care workers make up a key global workforce that is in daily danger of exposure to biological agents that cause illness and death.

The SARS outbreak of 2003 drove that fact home: in 72% of Ontario's 375 cases, people contracted the infection in a health care setting. Of that group, 45% were health care workers – most of them nurses.³ Globally, health care workers were at the highest risk, accounting for one-fifth of all SARS patients.⁴ More recently, in low- and middle-income countries, where tuberculosis (TB) continues to be a blight, health workers are at high risk of developing a multi-drug resistant form of the lung disease. As well, people who work in clinics are at increased risk of contracting hepatitis B and C, among other infectious diseases.

After the SARS pandemic showed how rapidly infection could race across the globe and rage through hospitals and clinics, Dr. Annalee Yassi, co-founder of the University of British Columbia's Global Health Research Program, formed a partnership with Dr. Elizabeth Bryce. Their work, which began as a CIHR-funded research project to find ways to put sustainable infection-control practices in place, quickly grew into an international collaboration that is active in several countries on four continents and has produced a number of key tools.



“We set a framework in place for prioritizing the needs of health workers in a way that hadn’t been the case. In fact, there was almost a view that it was unethical to make the needs of health workers a priority. But if health workers don’t take care of themselves, they aren’t going to be around to help patients.”

Dr. Annalee Yassi

One such output is the Occupational Health and Safety Information System (OHASIS), a user-friendly, web-based system to track incidents, exposures, risk factors, immunizations, injuries and diseases of health workers. OHASIS is a database that health care managers and health and safety personnel can use to monitor the workforce and see what needs to be done to keep health care workers safe and healthy. For example, if the data shows needle-stick incidents to be higher in one department, action can be taken to improve training and revisit procedures. The team also created online tools such as the “Protect Patti” interactive cartoon that teaches the proper selection, donning and doffing of personal protective equipment to prevent infection. Another tool consists of a five-lesson “Infection Control Basics” module that covers everything from effective hand washing to the proper protocols for cleaning up blood or body fluids.

In South Africa, Dr. Barry Kistnasamy, Executive Director of the National Institute for Occupational Health (NIOH), sees OHASIS playing a key role in the lab system’s TB-prevention campaign: “OHASIS will cover preventive interventions but also act as a sentinel warning system, through its employee health examinations and incident-reporting portal, to pick up employees who have TB. At an individual level it will provide feedback to the employee and ensure that due interventions are made. At a group level, the information will highlight which laboratory workplaces are at risk for higher TB incidence, ensuring that appropriate workplace assessments are conducted and solutions found.”

Ecuador is embracing the system as part of its infection control efforts in health care settings. “We are embedding the OHASIS platform in the design of our information and communications resource that we are working on with the Ministry of Health,” says Dr. Jaime Breilh of the Universidad Andina Simón Bolívar in Quito.

BEYOND OHASIS

In both Ecuador and South Africa, OHASIS is part of a larger contribution to public health. Dr. Yassi’s UBC team collaborated with the Pan American Health Organization to prevent transmission of infectious diseases among Ecuador’s health care workers. Dr. Yassi and her colleagues have worked in partnership with the country’s Ministry of Health to adapt a made-in-Canada workplace assessment tool – a checklist of physical, chemical, biological, ergonomic, safety and psychological hazards – and conducted a survey to assess knowledge, attitudes and practices at three hospitals. Through this OHASIS-precursor work, they have been able to pinpoint weaknesses and initiate projects such as campaigns to improve hand hygiene to reduce infection transmission.

Dr. Yassi and her colleagues have also helped establish a master’s program and PhD program in Ecuador that, so far, has attracted candidates from six Latin American countries.

“The goal is to build capacity by training people who can then train others in infection control and workplace safety,” says Dr. Breilh. “Dr. Yassi’s contribution and UBC’s contribution in helping us – their auspices, their direct presence as researchers, their teaching – all of these things have boosted a new stage of development of what we broadly call public health.”

In South Africa, funded by CIHR and the Global Health Research Initiative, the UBC team is working to boost the country’s capacity to design, implement and evaluate programs to improve health workers’ access to TB prevention, care and support.

“In Canada, we don’t realize the huge scourge that HIV and TB is playing in the health care sector globally,” says Dr. Yassi. “The South African Department of Health estimated that more than 30% of women who were pregnant in 2010 were infected with HIV. The dual epidemic of HIV and TB is a cause for concern for health care workers who are at high risk of exposure to TB in health care settings.”

Dr. Yassi’s efforts are being noticed. According to Susan Wilburn, technical officer in the World Health Organization’s Department of Public Health and Environment in Geneva, the South Africa project is indicative of Dr. Yassi’s ability to “find good partners and work well with them.” She sees the UBC team’s work as creating a model for global use.

“This is demonstrated by the way they have worked so effectively with colleagues in the Free State in South Africa to implement OHASIS, and the fact that the NIOH has said, ‘This is exactly what we need to manage our occupational health program in our laboratories in the national health system’ – I can’t imagine stronger uptake anywhere. Dr. Yassi is doing really important work in South Africa that has importance globally.”

1 World Health Organization, World Health Statistics 2011: www.who.int/whosis/whostat/2011/en/index.html.

2 World Health Organization, Health workers: www.who.int/occupational_health/topics/hcworkers/en/index.html.

3 The SARS Commission Executive Summary, *Spring of Fear 1* (Dec. 2006), p. 12. Available at www.ontla.on.ca/library/repository/mon/16000/268478.pdf.

4 Severe acute respiratory syndrome (SARS) and healthcare workers. *International Journal of Occupational and Environmental Health* 10, 4 (Oct.-Dec. 2004): 421–427.

WRITING THE BOOK ON PROTECTING HEALTH CARE WORKERS FROM HIV/TB

IN 2010, THE JOINT WHO-ILO-UNAIDS POLICY GUIDELINES ON IMPROVING HEALTH WORKERS’ ACCESS TO HIV AND TB PREVENTION, TREATMENT, CARE AND SUPPORT SERVICES WARNED OF THE DUAL EPIDEMIC THREAT TO HEALTH CARE WORKERS. THE THREE AGENCIES REPORTED THAT WHILE HEALTH WORKERS “EXPERIENCE MORBIDITY AND MORTALITY DUE TO EXPOSURE TO HIV AND TB AT WORK AND IN THEIR LOCAL COMMUNITIES,” THEY OFTEN DO NOT HAVE ACCESS TO HIV AND TB PREVENTION AND TREATMENT SERVICES. IN PUBLISHING THE GUIDELINES, THE AGENCIES SINGLED OUT THE CONTRIBUTION OF DR. YASSI, GRADUATE STUDENT LYNDSEY DYBKA AND THE UBC TEAM FOR CONDUCTING THE SYSTEMATIC REVIEW OF EVIDENCE, DEVELOPING THE BACKGROUND SYNTHESIS REPORT AND WRITING THE INITIAL DRAFT OF THE GUIDELINES.

FOR MORE INFORMATION:

Assuming our global responsibility: improving working conditions for health care workers globally, *Open Medicine* 3, 3 (2009): 174–177.

Collaboration between infection control and occupational health in three continents: a success story with international impact, *BMC International Health and Human Rights* 11 (Suppl 2):S8 (2011): doi:10.1186/1472-698X-11-S2-S8.

View the “Protect Patti” instructional video at: innovation.ghrp.ubc.ca/ProtectPatti/eng/.

World Health Organization, Global tuberculosis control 2011: www.who.int/tb/publications/global_report/2011/en/index.html.

World Health Organization, The joint WHO-ILO-UNAIDS policy guidelines on improving health workers’ access to HIV and TB prevention, treatment, care and support services: www.who.int/occupational_health/publications/hiv_tb_guidelines/en/index.html.

Video with Dr. Yassi: www.youtube.com/healthresearchcanada.



EVIDENCE IN ACTION: A TOOL TO PROTECT HEALTH CARE WORKERS

DR. YASSI AND HER COLLEAGUES HAVE PARTNERED WITH THE NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH IN SOUTH AFRICA TO ROLL OUT OHASIS ACROSS THAT COUNTRY'S NATIONAL HEALTH LABORATORY SYSTEM, WHICH HAS 349 LABS AND APPROXIMATELY 7,000 EMPLOYEES AT 150 SITES, AND AT THREE HOSPITALS IN THE FREE STATE PROVINCE. HER TEAM IS WORKING WITH THE US NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH AND SAFETY (PART OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION) TO MAKE OHASIS AVAILABLE AT US HOSPITALS. SPAIN, GHANA AND COLOMBIA HAVE EXPRESSED INTEREST, WHILE ECUADOR AND THE CITY OF VIENNA ARE IN THE PLANNING STAGES OF IMPLEMENTATION.

RURAL RELIEF: A NEW DELIVERY MODEL FOR THE DIAGNOSIS AND TREATMENT OF DEMENTIA

Diagnosis and treatment plan in a day, not a year

AT A GLANCE

WHO: DR. DEBRA MORGAN, UNIVERSITY OF SASKATCHEWAN

ISSUE: RURAL CANADIANS AND THEIR FAMILIES FACE A HEAVY BURDEN IN COPING WITH DEMENTIA. THE CURRENT MODEL REQUIRES TRAVEL TO CITIES – OFTEN SEVERAL TIMES OVER MONTHS OR YEARS – TO SEE SPECIALISTS, GET A DIAGNOSIS AND ARRANGE AND RECEIVE CARE.

PROJECTS: DR. MORGAN LED A CIHR-SUPPORTED PROJECT THAT ASSESSED THE NEEDS OF DEMENTIA PATIENTS AND THEIR FAMILIES AND CAREGIVERS LIVING IN RURAL SASKATCHEWAN. BASED ON THEIR FINDINGS, THEY DESIGNED THE RURAL AND REMOTE MEMORY CLINIC IN SASKATOON, A ONE-STOP FACILITY WHERE PATIENTS GO THROUGH A SERIES OF TESTS AND SEE DEMENTIA EXPERTS ALL IN ONE DAY, THEN GET THEIR DIAGNOSIS AND TREATMENT PLAN BEFORE RETURNING HOME. THE RESEARCH TEAM HAS CONTINUED TO COLLECT AND ANALYZE DATA TO IMPROVE TREATMENT OPTIONS.

RESEARCH EVIDENCE: DR. MORGAN AND COLLEAGUES HAVE PUBLISHED SEVERAL PAPERS DEMONSTRATING HOW THE ONE-STOP APPROACH, COMBINED WITH FOLLOW-UP TREATMENTS THAT MAKE USE OF SASKATCHEWAN'S 179 TELEHEALTH CENTRES, HAS TRANSFORMED THE DIAGNOSIS AND CARE OF RURAL DEMENTIA PATIENTS.

EVIDENCE IN ACTION: USING THE NEW MODEL, THE TEAM HAS DRASTICALLY DECREASED THE TIME REQUIRED TO PROVIDE DIAGNOSIS AND TREATMENT, DOING IN A SINGLE DAY WHAT COULD ORDINARILY TAKE MORE THAN A YEAR. THE CLINIC HAS OFFERED SUPPORT SERVICES FOR ALMOST 1,000 FAMILY MEMBERS AND TREATED ALMOST 400 PATIENTS. A TELEHEALTH-BASED SUPPORT GROUP FOR SPOUSES AND CAREGIVERS OF PATIENTS WITH FRONTOTEMPORAL DEMENTIA (FTD) WAS INITIATED IN 2009 AND IS CURRENTLY BEING ROLLED OUT AS A SUPPORT PROGRAM BY THE ALZHEIMER SOCIETY OF SASKATCHEWAN.

SOURCES: MORGAN ET AL. IMPROVING ACCESS TO DEMENTIA CARE: DEVELOPMENT AND EVALUATION OF A RURAL AND REMOTE MEMORY CLINIC, *AGING & MENTAL HEALTH* 13, 1 (JANUARY 2009): 17–30.

EVIDENCE IN ACTION: DIAGNOSIS AND TREATMENT PLAN IN A DAY, NOT A YEAR

THE MEMORY CLINIC STANDS AS A MODEL FOR THE ONE-STOP APPROACH TO DIAGNOSING DEMENTIA, AND DEMONSTRATES HOW TO MAKE OPTIMAL USE OF TELEHEALTH TO PROVIDE CARE AND SUPPORT FOR PATIENTS AND FAMILIES WHO LIVE FAR FROM CITIES. SO FAR, IN SASKATCHEWAN, IT HAS HELPED ALMOST 400 PEOPLE AND ALMOST 1,000 FAMILY MEMBERS AND CAREGIVERS.

Often, the first sign is simply forgetfulness. Not remembering where the car is parked. Blanking on yesterday's conversations. Is it dementia in its early stages or just garden-variety absent-mindedness brought about by getting older? Early diagnosis of Alzheimer's disease and related dementias is crucial to getting timely treatments that can minimize symptoms and to accessing interventions that offer families much-needed support.

Unfortunately, no simple test exists for dementia. Arriving at a diagnosis often requires tricky navigation through the health care system: seeing the family doctor, following up on referrals to specialists and going for – and awaiting the results from – a battery of tests. The process places extra demands on people in rural or remote communities who must travel many miles, many times, to town.

"People were spending more than a year waiting for appointments and going back and forth," says CIHR-funded researcher Dr. Debra Morgan of the University of Saskatchewan. "That's definitely not ideal for families struggling with dementia symptoms."

With Canada facing a "dementia epidemic" that will see the number of patients more than double from the current 500,000 within a generation, finding better ways to diagnose and care for people is an urgent challenge.

Dr. Morgan and colleagues responded to that challenge through the creation of the Rural and Remote Memory Clinic at the Royal University Hospital in Saskatoon, an interprofessional team comprising a neurologist, neuropsychologists, physiotherapists and a nurse coordinator. "Patients get all their investigations done and they get their CT scan," says Dr. Morgan "Our goal is to have a diagnosis for them and a plan for treatment and management of their problem by the end of the day."

Videoconferencing helps. "Before the patient and their family members come to Saskatoon, they go to their local hospital or health centre, wherever the telehealth facility is located, and our neuropsychologist and nurse spend a half hour with them gathering information about their history and the problems they've been experiencing," says Dr. Morgan. "That way, we're prepared to give a tailored assessment when they come. It also makes the patient more comfortable – when they arrive they'll say, 'I saw you on TV!' We establish a relationship with them."

Research played an important role in determining how the Memory Clinic uses telehealth as part of its treatment model. "Because of CIHR funding, before we implemented the clinic we were able to travel over 7,000 kilometres as a team to meet with health care providers in all the communities that, at that time, had telehealth," says Dr. Morgan, who holds an Applied Chair in Health Services and Policy Research. "We talked to doctors and nurses and home care workers and other health professionals to gather their insights."

Based on that information, the team modified both the format of the clinic and the design of the research, says Dr. Morgan. "For example, we learned from remote northern communities that requiring people to alternate between telehealth and in-person appointments was a real barrier to buy-in. Some patients would have to drive more than 400 kilometres for the face-to-face follow-ups. So, we modified our research design and treated the remote northern communities as a separate study, offering telehealth for all their follow-up appointments."

After collecting data from patients and their family members throughout the first four years of operation, the Memory Clinic team established videoconferencing as such a strong strategy that they now offer telehealth for all follow-up appointments.

For Heather Dyck, a homemaker who lives in Birch Hills, a two-hour drive northeast of Saskatoon, the Memory Clinic "gave us our dad back."

Several years ago, her father Fred, then in his early 70s with a history of heart disease, small strokes and epilepsy, began losing mental capacity, the ability to walk and bladder control. "Our family doctor just sort of said that with all those things going on, it's just more strokes or whatever. I wasn't satisfied and asked if we could be referred elsewhere."

SUPPORT FOR SPOUSES OF FTD PATIENTS

FRONTOTEMPORAL DEMENTIA (FTD) USUALLY TAKES HOLD AT A YOUNGER AGE THAN ALZHEIMER'S DISEASE AND ARRIVES WITH A DIFFERENT SET OF SYMPTOMS – BEHAVIOURAL RATHER THAN MEMORY RELATED. "FAMILIES OF THESE FTD PATIENTS REALLY STRUGGLE. THERE ARE NO RESOURCES TAILORED TO THEM," SAYS DR. MORGAN. DRS. MEGAN O'CONNELL AND MARGARET CROSSLEY, RURAL AND REMOTE MEMORY CLINIC NEUROPSYCHOLOGISTS, WORKED WITH SPOUSES OF FTD PATIENTS TO DEVELOP AND EVALUATE A TELEHEALTH-BASED SUPPORT GROUP. IN OPERATION SINCE JANUARY 2009, THE SPOUSES MEET EVERY MONTH VIA VIDEOCONFERENCING TO SHARE THEIR EXPERIENCES AND OFFER EACH OTHER SUPPORT. THE PROGRAM HAS BEEN SO SUCCESSFUL THAT THE ALZHEIMER SOCIETY OF SASKATCHEWAN HAS ADOPTED THE MODEL AND IS NOW OPERATING A SIMILAR TELEHEALTH-DELIVERED SUPPORT GROUP FOR FTD CAREGIVERS.



FROM GETTING SUPPORT TO GIVING SUPPORT

THE SUPPORT GROUP THAT RESEARCHERS DRs. MARGARET CROSSLEY AND MEGAN O'CONNELL ORGANIZED AND EVALUATED FOR SPOUSAL CAREGIVERS OF PATIENTS WITH FTD LED TO THE PRODUCTION OF VIDEOS FEATURING THREE OF THE SPOUSES SHARING THEIR EXPERIENCES. THE VIDEO IS AVAILABLE AT THE UNIVERSITY OF SASKATCHEWAN RURAL DEMENTIA CARE WEBSITE: WWW.CCHSA-CCSSMA.USASK.CA/RURALDEMENTIACARE/AFFILIATED.HTML#ftd. AS WELL, DONNA DALZIEL, ONE OF THE CAREGIVERS, HAS GONE ON TO DEVELOP A PROGRAM OF ENGAGEMENT ACTIVITIES FOR PEOPLE WITH FTD. HER VIDEO IS AVAILABLE AT: WWW.CCHSA-CCSSMA.USASK.CA/RURALDEMENTIACARE/LINKS.HTML#donna.

The experts at the Memory Clinic diagnosed her father with normal pressure hydrocephalus, a rare condition in which a build-up of fluid in the brain can lead to symptoms of dementia, difficulty in walking and incontinence.

"The surgery was done and a shunt was implanted," says Mrs. Dyck. "So instead of life in a wheelchair, limited ability to even talk and no bladder control, Dad went back to driving a car and being fully functional for a number of years. He passed away last December, but he had several years of good quality life that he would not have had without the Memory Clinic. It would not have been caught anywhere else."

While helping families like Mrs. Dyck's is the Memory Clinic's main purpose, it is as much a research lab as it is a clinic. "Right from the beginning, we have been evaluating everything and developing ongoing research," says Dr. Morgan. "All of our team members are co-investigators of related spinoff projects."

Roger Carriere, Executive Director of the Community Care Branch of Saskatchewan's Ministry of Health, views the Memory Clinic as a model for increasing the availability and accessibility of dementia care for those outside of urban centres.

"We're very pleased with the service," says Mr. Carriere. "In particular, the clinic operates under a family-centred model of care, involving the patient's family and caregivers at all points. It could serve as a model for other provinces who are attempting to provide care in rural and remote areas."

"Dealing with dementia is isolating enough. Often FTD caregivers are still working. They may still be caring for children and caring for aging parents at the same time. For us, it's invaluable to have a model for an FTD support group that has been developed through a research project and is evidence-based and credible. It's a win-win situation."

Joanne Bracken, Executive Director of the Alzheimer Society of Saskatchewan

FOR MORE INFORMATION:

Evaluation of Telehealth for Preclinic Assessment and Follow-Up in an Interprofessional Rural and Remote Memory Clinic, *Journal of Applied Gerontology* 30, 3 (2011): 304. Available at jag.sagepub.com/content/30/3/304.

Interdisciplinary research and interprofessional collaborative care in a memory clinic for rural and northern residents of western Canada, *Australian Psychologist* 43, 4 (Dec. 2008): 231-238. Available at www.tandfonline.com/doi/abs/10.1080/00050060802492564.

The Rural and Remote Memory Clinic website: www.cchsa-ccssma.usask.ca/ruraldementiacare/rrmc.html.

Alzheimer Society of Canada, Rising Tide: The Impact of Dementia on Canadian Society: www.alzheimer.ca/en/Get-involved/Raise-your-voice/Rising-Tide.

Video with Rural and Remote Memory Clinic team: www.youtube.com/healthresearchcanada.

EPIQ RESULTS: RECONFIGURING NEONATAL CARE SAVES MORE PRETERM BABIES FROM DISABILITY AND DEATH

Model of care now used internationally

AT A GLANCE

WHO: DR. SHOO K. LEE, UNIVERSITY OF TORONTO

ISSUE: PRETERM BABIES ARE AT GREATER RISK OF DEATH AND DISABILITIES AND ACCOUNT FOR A DISPROPORTIONATELY HIGH SHARE OF HOSPITALS' POSTNATAL CARE COSTS.

PROJECTS: DR. LEE BEGAN WHAT EVENTUALLY BECAME EPIQ (EVIDENCE-BASED PRACTICE FOR IMPROVING QUALITY) IN 2002 TO REDUCE RISING RATES OF NOSOCOMIAL (HOSPITAL-ACQUIRED) INFECTIONS AND A LUNG DISEASE CALLED BRONCHOPULMONARY DYSPLASIA (BPD). IT WAS FOLLOWED BY A THREE-YEAR EFFORT TO APPLY EPIQ STRATEGIES ACROSS CANADA AND BY EPIQ II, WHICH TARGETS ADDITIONAL PRETERM HEALTH THREATS.

RESEARCH EVIDENCE: A RANDOMIZED CONTROLLED TRIAL AT 12 CANADIAN NEONATAL INTENSIVE CARE UNITS (NICUs) REDUCED NOSOCOMIAL INFECTIONS BY 44% AND BPD BY 15%, A COST SAVINGS OF ALMOST \$2,500 PER PATIENT. A STUDY FOUND THE IMPROVEMENTS IN THE NICUs WERE SUSTAINED TWO YEARS AFTERWARDS. EARLY RESULTS FROM EPIQ II INDICATE REDUCTIONS IN OTHER DISEASES AS WELL.

EVIDENCE IN ACTION: EPIQ IS CURRENTLY OPERATIONAL IN 30 NICUs ACROSS CANADA, HELPING TO CRAFT AND IMPLEMENT CONTINUOUS QUALITY IMPROVEMENT PRACTICES. INTERNATIONALLY, THE EPIQ MODEL HAS BEEN ADOPTED BY SIX LATIN AMERICAN COUNTRIES, 38 NICUs IN MALAYSIA AND IS BEING PILOTTED IN CHINA.

SOURCES: LEE ET AL. THE EPIQ TRIAL: REDUCTION IN NOSOCOMIAL INFECTION AND BRONCHOPULMONARY DYSPLASIA WERE SUSTAINED 2 YEARS AFTER THE TRIAL, POSTER PRESENTATION AT PEDIATRIC ACADEMIC SOCIETIES CONFERENCE 2010.

EVIDENCE IN ACTION: HOSPITAL-ACQUIRED INFECTION RATE CUT BY 30%.

PRELIMINARY ANALYSIS OF THE FIRST TWO YEARS OF EPIQ II SHOWS THE MODEL IS WORKING: “WE HAVE REDUCED NOSOCOMIAL INFECTION RATES ACROSS THE COUNTRY BY 30%, RETINOPATHY OF PREMATURITY BY 20%, AND NECROTIZING ENTEROCOLITIS BY 15%,” SAYS DR. LEE.

The 1990s was not a good decade for preterm babies in Canadian hospitals, according to Dr. Shoo K. Lee, who was then working at the Children’s & Women’s Health Centre of British Columbia. “We were seeing very little improvement in outcomes,” says Dr. Lee, who is now at the University of Toronto and leads pediatric and neonatal programs at three hospitals. “We made huge advances from about 1960 to 1990, but it had plateaued. If anything, it might actually have gotten worse.”

At the same time, says Dr. Lee, the patient load had increased by over 30%, largely because more women were having children later in life and many were using in vitro fertilization to get pregnant – two factors linked to higher incidence of preterm births.

“Some experts thought we had reached the limits of neonatal technology, that until we got the next jump forward we were not going to see much improvement. Well, what were we going to do in the meantime, sit on our backsides? We had to do better. That’s how it got started.”

The “it” Dr. Lee refers to is the Canadian Neonatal Network. Created in 1995, the Network focuses on ways to improve the health and treatment of newborns in hospitals, especially those in neonatal intensive care units (NICUs). Such babies are at a high risk for nosocomial (hospital-acquired) infections and a chronic lung disease linked to ventilator use called bronchopulmonary dysplasia (BPD). As well, NICU care is expensive: babies born at less than 28 weeks gestation have average hospital costs of \$84,235, compared to \$1,050 for full-term babies.

With CIHR funding, Dr. Lee and the Network’s experts built a database to track neonatal care across Canada that showed significant variations in practices and outcomes.

“There were strengths and weaknesses across the country,” says Dr. Lee. “We said, ‘OK, now that we know that some of us do certain things better than others, how do we make changes?’”

Dr. Lee, who has a background in economics, championed the use of the continuous quality improvement (CQI) model. In the manufacturing sector, CQI stresses the need to constantly evaluate and refine processes to better serve clients and reduce production costs. However, realizing that a model for producing better widgets is not directly applicable to doing a better job of saving preterm babies’ lives, “we brought evidence into CQI,” says Dr. Lee. “It’s called Evidence-Based Practice for Improving Quality (EPIQ).”

In essence, EPIQ helps hospitals create teams of neonatologists, nurses, respiratory therapists, research assistants, dieticians and other experts and trains them to gather and analyze data, target specific practices or processes, and work with front-line NICU staff to make changes. (See sidebar: *How EPIQ works*, page 11.)

“We created the model and then we tested it with a two-year randomized controlled trial to prove it could work,” says Dr. Lee of the original study. “We took six hospitals and asked them to reduce BPD and another six hospitals and asked them to reduce nosocomial infections.”

From 2003 to 2005, the NICUs using the new model demonstrated a 44% decrease in the incidence of nosocomial infections and a 15% decrease in BPD, which translated into a reduction of NICU patient stays of almost two days and a cost saving of almost \$2,500 per patient. If implemented nationally, the cost savings would amount to \$7.5 million per year. A follow-up study found the improvements were sustained two years after the EPIQ trial with infection incidence decreasing further among several NICUs.

With funding from CIHR and the Michael Smith Foundation for Health Research, the Network produced guidelines based on the new model’s success with BPD and nosocomial infections and distributed them to all Canadian hospitals with NICUs.

However, says Dr. Lee, they soon discovered that creating and circulating guidelines is simply not enough. “The reality is, it’s not so easy for uptake to happen. Sometimes people just don’t believe the guidelines. Even when they do believe, sometimes they say, ‘It can’t be done here.’ There sometimes can be a leadership problem. There are many reasons why these things don’t happen.”

That realization led Dr. Lee and Network colleagues to create the CIHR-supported EPIQ II. This time, the team highlighted a specific set of challenges to be addressed and paid more attention to tools that would achieve the cultural changes necessary for successful implementation of the EPIQ model. EPIQ II has engaged all NICUs across Canada in a coordinated effort to improve outcomes in BPD and nosocomial infections and three other major conditions that afflict preterm babies: intraventricular hemorrhage (bleeding in the brain that can cause brain damage) necrotizing enterocolitis (a frequently deadly infection that kills intestinal tissue) and retinopathy of prematurity (abnormal blood vessel development in the retina that can lead to blindness).

Dr. Eugene Ng has seen improvements occur at his NICU at Toronto’s Sunnybrook Health Sciences Centre where, from 2008 to 2010, NICU deaths dipped 75%, the incidences of retinopathy of prematurity and nosocomial infections were cut in half and BPD fell by 27%. While Dr. Ng cautions that moving Sunnybrook’s NICU from outdated quarters to a more spacious modern facility also had an important impact, he says quality improvement initiatives such as EPIQ have been a key driver in his hospital’s steep reduction in the incidence of preterm babies’ diseases. “The whole idea of EPIQ is to improve outcomes. We are seeing results, which is very encouraging.”

The Foothills Medical Centre, meanwhile, was one of two NICUs in Canada to apply new evidence from EPIQ II to help reduce the incidence of necrotizing enterocolitis. “We were running at a 9% incidence rate in 2008–09 and we are now down to about 2.5%, says Dr. Wendy Yee, a staff neonatologist at Foothills. For us, it’s huge in terms of mortality and morbidity as well.” Dr. Yee attributes the remarkable reduction in the incidence of the disease directly to the Centre’s adoption of the EPIQ model. “It allows us to sustain practice changes, which is what really makes an impact in the long term.”

Other nations have noticed the remarkable improvements that Canadian NICUs have made over the past decade. According to Dr. Lee, the EPIQ model has been adopted by six Latin American countries – Argentina, Brazil, Chile, Colombia, Ecuador and Peru – and is in place at 38 NICUs in Malaysia. “Many countries are coming to us, saying ‘How are you doing this? We want to learn from you,’” says Dr. Lee. “We went to China and trained teams in several hospitals, helping them put an EPIQ system in place.”

Dr. Yun Cao, with the Children’s Hospital of Fudan University in Shanghai, says a multicentre trial is under way to implement EPIQ and improve outcomes. “So far, I only have results from our hospital, but from the data we can see a reduction of almost 50% in ventilator associated pneumonia. I want to do further study to see if we can reduce other complications as well.”

FOR MORE INFORMATION:

EPIQ website: www.epiq.ca/Home/tabid/36/Default.aspx.

The Canadian Neonatal Network website: www.canadianneonatalnetwork.org/portal/CNNHome.aspx.

Improving the quality of care for infants: a cluster randomized controlled trial, *Canadian Medical Association Journal* 181, 8 (Oct. 2009): doi:10.1503/cmaj.081727. Available at www.cmaj.ca/content/181/8/469.

Variations in practice and outcomes in the Canadian NICU network: 1996–1997, *Pediatrics* 106, 5 (Nov. 2000): 1070–79. Available at www.ncbi.nlm.nih.gov/pubmed/11061777.

Video with Dr. Lee: www.youtube.com/watch?v=BocnVxhKZ9g.

HOW EPIQ WORKS: EVIDENCE + CULTURE CHANGE

EPIQ WORKS BY COMBINING A FOCUS ON THE COLLECTION AND ANALYSIS OF DATA ABOUT CARE IN NICUs, WITH TOOLS FOR HELPING FACILITATE CULTURAL CHANGES WITHIN HEALTH CARE CENTRES. FOR EXAMPLE, EPIQ EXPERTS TRAIN TEAMS TO CONDUCT EVIDENCE REVIEWS, GATHER AND ANALYZE DATA, CREATE AND REFINE PROCESS-OF-CARE MAPS, MANAGE CHANGE AND MEASURE OUTCOMES. THE IN-HOUSE TEAM ALSO COLLECTS DATA THAT EPIQ EXPERTS BENCHMARK AGAINST OTHER HOSPITALS AND USE TO IDENTIFY PROCESSES WITH POOR OUTCOMES. AT THE SAME TIME, EPIQ EXPERTS VISIT HOSPITALS AND CONDUCT STAFF INTERVIEWS, FOCUS GROUPS AND SURVEYS TO ASSESS ORGANIZATIONAL STRUCTURE AND CULTURE AND IDENTIFY POTENTIAL BARRIERS TO CHANGE. EPIQ PROVIDES FUNDING FOR A COORDINATOR TO CHAMPION CHANGES IN PRACTICE, TRAIN STAFF AND ENSURE REQUIRED MATERIALS AND EQUIPMENT ARE IN PLACE.



**INFECTION RATE
CUT BY 30%**

EVIDENCE IN ACTION: A MODEL OF CARE USED INTERNATIONALLY

THE EPIQ MODEL HAS BEEN ADOPTED BY SIX LATIN AMERICAN COUNTRIES – ARGENTINA, BRAZIL, CHILE, COLOMBIA, ECUADOR AND PERU – AND IS IN PLACE AT 38 NICUs IN MALAYSIA.

GATHERING MORE EVIDENCE

FOR MORE INFORMATION:

Roadmap Signature Initiatives: www.cihr-irsc.gc.ca/e/43567.html.

FUTURE RESEARCH INITIATIVES TO SUPPORT A HIGH-QUALITY, ACCESSIBLE AND SUSTAINABLE HEALTH CARE SYSTEM

HELPING SUPPORT A HIGH-QUALITY, ACCESSIBLE AND SUSTAINABLE HEALTH CARE SYSTEM IS AN IMPORTANT PRIORITY FOR CIHR. TO BETTER FOCUS INVESTMENTS, THE ORGANIZATION HAS RECENTLY LAUNCHED A NUMBER OF MAJOR RESEARCH INITIATIVES TO INCREASE RESEARCH ACTIVITY IN THIS AREA. KNOWN AS CIHR ROADMAP SIGNATURE INITIATIVES,¹ THESE NEW INVESTMENTS WILL HELP CIHR ALLOCATE ITS RESOURCES TO MAKE THE STRONGEST POSSIBLE IMPACT ON HEALTH AND HEALTH CARE – TODAY, TOMORROW AND WELL INTO THE FUTURE.

ROADMAP SIGNATURE INITIATIVE – COMMUNITY-BASED PRIMARY HEALTH CARE

THIS INITIATIVE COVERS THE BROAD RANGE OF PRIMARY PREVENTION AND PRIMARY CARE SERVICES WITHIN THE COMMUNITY (INCLUDING PUBLIC HEALTH, HEALTH PROMOTION AND DISEASE PREVENTION); THE DIAGNOSIS, TREATMENT, AND MANAGEMENT OF CHRONIC AND EPISODIC ILLNESSES; REHABILITATION SUPPORT; AND END-OF-LIFE CARE. COMMUNITY-BASED PRIMARY HEALTH CARE INVOLVES THE COORDINATION AND PROVISION OF INTEGRATED CARE PROVIDED BY A RANGE OF HEALTH PROVIDERS, INCLUDING NURSES, SOCIAL WORKERS, PHARMACISTS, DIETICIANS, PUBLIC HEALTH PRACTITIONERS, PHYSICIANS AND OTHERS IN A RANGE OF COMMUNITY SETTINGS INCLUDING PEOPLE'S HOMES, HEALTH CARE CLINICS, PHYSICIANS' OFFICES, PUBLIC HEALTH UNITS, HOSPICES AND WORKPLACES. IT IS DELIVERED IN A WAY THAT IS PATIENT- AND POPULATION-CENTRED AND RESPONSIVE TO ECONOMIC, SOCIAL, CULTURAL AND GENDER DIFFERENCES.

ROADMAP SIGNATURE INITIATIVE – EVIDENCE-INFORMED HEALTH CARE RENEWAL

THE EVIDENCE-INFORMED HEALTH CARE RENEWAL INITIATIVE WILL SUPPORT RESEARCHERS AND DECISION MAKERS TO WORK TOGETHER TO ADVANCE THE CURRENT STATE OF KNOWLEDGE, GENERATE NOVEL AND CREATIVE SOLUTIONS, AND TRANSLATE EVIDENCE FOR UPTAKE INTO POLICY AND PRACTICE TO STRENGTHEN CANADA'S HEALTH CARE SYSTEMS.

ROADMAP SIGNATURE INITIATIVE – PATHWAYS TO HEALTH EQUITY FOR ABORIGINAL PEOPLES

THROUGH THE PATHWAYS TO HEALTH EQUITY FOR ABORIGINAL PEOPLES SIGNATURE INITIATIVE, CIHR WILL FUND RESEARCH TO FIND OUT HOW WE CAN BRING TOGETHER WESTERN SCIENTIFIC KNOWLEDGE AND THE TRADITIONAL KNOWLEDGE OF FIRST NATIONS, INUIT AND METIS PEOPLES TO IDENTIFY HEALTH INTERVENTIONS THAT WORK. THE INITIATIVE AIMS TO FIND WAYS TO ADAPT EXISTING HEALTH RESEARCH TO THE DIVERSE NEEDS OF ABORIGINAL COMMUNITIES, WHERE VALUES, TRADITIONAL KNOWLEDGE AND HISTORY VARY GREATLY.

¹ The name Roadmap Signature Initiatives is linked to CIHR's five-year strategic plan, *Health Research Roadmap: Creating innovative research for better health and health care*.

NEED MORE EVIDENCE?

Thank you for reading **Issue No. 3** of *Show me the Evidence*. We hope that you enjoyed learning more about the impact of Canadian health researchers and encourage you to visit CIHR's website www.cihr-irsc.gc.ca and social media sites www.cihr-irsc.gc.ca/e/42402.html to learn about other CIHR-funded success stories.

IN ISSUE NO. 4 OF *SHOW ME THE EVIDENCE* WE WILL BE LOOKING AT RESEARCH EFFORTS STUDYING HOW TO REDUCE THE HEALTH INEQUITIES OF ABORIGINAL PEOPLES AND OTHER VULNERABLE POPULATIONS.

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www.cihr-irsc.gc.ca/e/44921.html

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