

ALBERTA INNOVATES

# ANNUAL IMPACT REPORT: HEALTH

2015-16

## ACKNOWLEDGMENTS

This report is a summary of the progress and impacts resulting from research and innovation activities supported by the health funding portfolio of Alberta Innovates (formerly Alberta Innovates - Health Solutions) as reported in 2015-16.

The impact demonstrated by Alberta Innovates through our health research and innovation investments reflects the achievements being made by our partners, researchers and members of their research groups, trainees, and many more. We gratefully acknowledge the effort of our research community and partners in compiling and submitting their outcomes and impacts for this report.

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Annual Impact Report 2015-16 (Alberta Innovates – formerly Alberta Innovates - Health Solutions)

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# EXECUTIVE SUMMARY

On November 1, 2016, Alberta Innovates - Health Solutions joined with the other three corporations in the Innovates family under the name Alberta Innovates. This report is a summary of the progress and impacts resulting from research and innovation activities supported by the health funding portfolio of Alberta Innovates (formerly Alberta Innovates - Health Solutions) as reported in 2015-16.

A critical factor for a high performing health system and better health is a strong and vibrant local health research and innovation enterprise. Alberta Innovates plays a unique role in this by supporting health research and innovation activities. These activities focus on the priority health needs of Albertans and range across the continuum from first discovery to final innovation. Our diverse portfolio of investments helps grow and maintain Alberta's human capacity to meet continued and emerging health needs, within and outside of Alberta.



Since our inception, Alberta Innovates, and previously, Alberta Innovates - Health Solutions, has been building connections to support the province's health research and innovation ecosystem. Linkages between different organizations and people enable common issues to be addressed and accelerates the process of putting solutions into practice where the needs of Albertans are served. The pooling of expertise and the leveraging of resources better positions us to maximize the health, social and economic impacts of research and innovation.



This report demonstrates annual progress in achieving tangible impacts on the health and well-being of Albertans and our health care system. As a publicly-funded organization, this report provides one source of evidence of the value being delivered to Albertans through our investments. The impact highlights on page 3 show the multitude of ways that our strategic investments, provincial platforms and partnerships and collaborations are making a difference for Albertans. These achievements reflect the efforts of our researchers and trainees as well as the collective efforts of many public and private organizations. It is through the building of critical human capacity and infrastructure and the leveraging the expertise and resources that Alberta will best be able to address the health needs of our citizens, both now and in the future. As we continue our transformation into Alberta Innovates, we will be better positioned to be even more responsive to these needs.





ALBERTA INNOVATES

# Health Research and Innovation (R&I) Impact Highlights (2015-16)



## Catalyzing Health R&I

*from discovery  
to impact*

\$98.7 MILLION IN  
ANNUAL INVESTMENTS\*



Almost

**600**

RESEARCH PROJECTS

to test new ideas and  
address health challenges

## Collaborating to accelerate health R&I

**49** INDUSTRY  
PARTNERS



Moving **research and innovation** into  
**practice** with Alberta Health Services



**66%**

of our researchers **engage & partner**  
with industry & end-users

## Making R&I easier to do in Alberta

Creating a stronger patient voice



Providing **real time**  
**information** about Alberta  
clinical trials

Improving  
access  
to health data  
by integrating

**1000**

HEALTH  
DATABASES

## Enhancing health and wellbeing

Research impacts improving health:

**60%**  
quality  
of care



**24%** health  
status

**16%** determinants  
of health



EXAMPLE

New colorectal surgical  
practices save up to  
**\$5,900**  
per patient



EXAMPLE

Faster stroke  
treatment  
means



EXAMPLE

Pharmacists involved in  
chronic disease care means

**21%** ↓ risk of cardiovascular  
events

**50%** ↓ in disability  
& **30%** ↓ in death rate

## Growing our economy



**2519**

knowledge-based  
workers supported

**\$1**



**\$3.18**



leveraged by our funded research projects

**\$1**



**\$3.55**



leveraged from our partnerships

\*The reported results are a sample of key investments



# INTRODUCTION

Alberta Innovates is committed to evolving Alberta's research and innovation system to be more responsive to the needs of Albertans and more focused on impacts. Consolidating creates one main hub for support and leadership in the innovation space, making it easier for researchers, innovators, businesses and entrepreneurs to access the full breadth of our services. By tapping into our collective assets we can deliver the kind of holistic support and leadership that is necessary for Alberta businesses, research and entrepreneurs to take their ideas and innovations into practice and to market in a globally competitive environment.

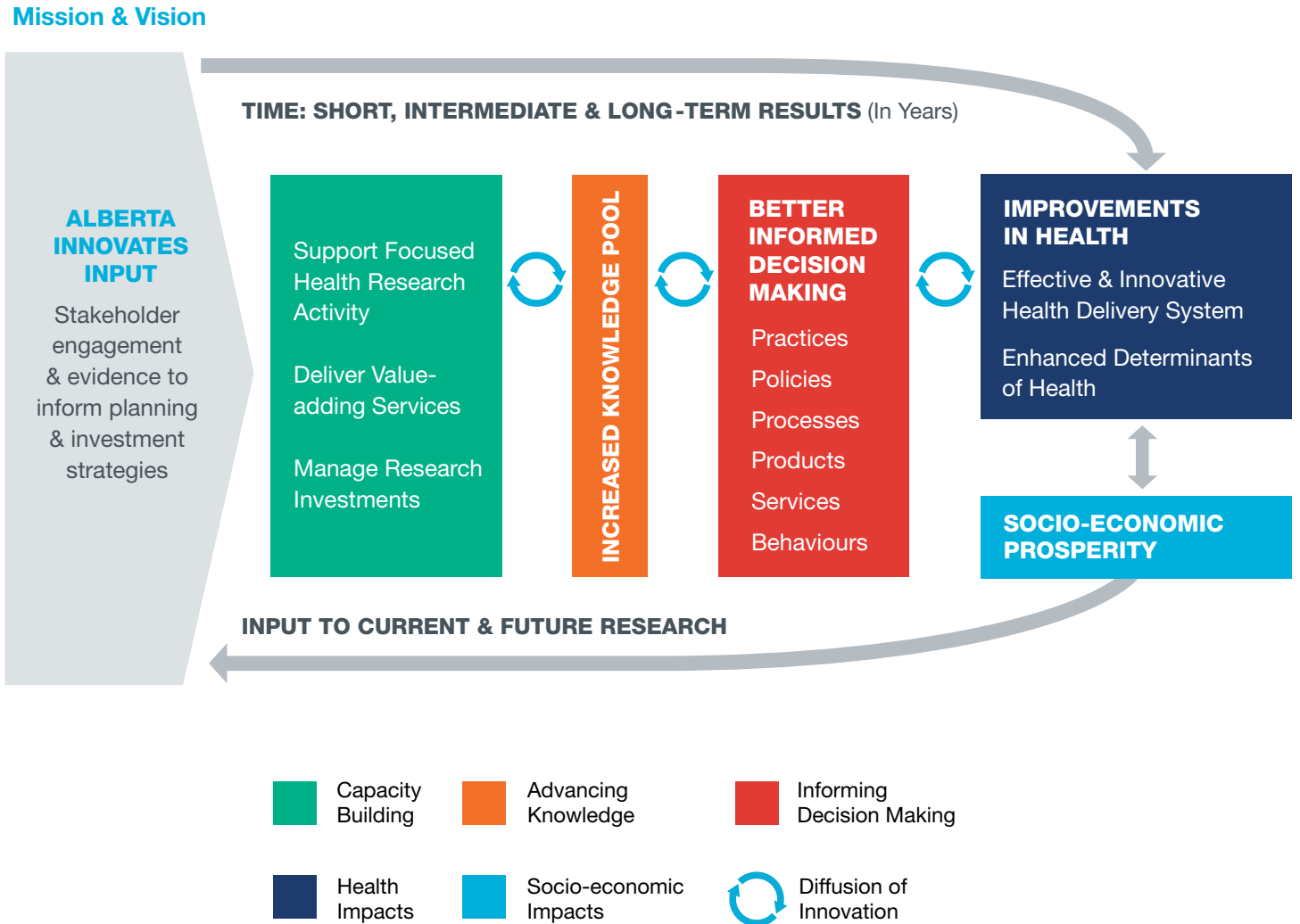
The Alberta Innovates Annual Impact Report demonstrates the value delivered by our researchers, trainees and partnerships in 2015-16 through our publicly-funded investments (formerly through Alberta Innovates - Health Solutions) in health research and innovation (Appendix A). Through health research and innovation, Alberta Innovates is working to achieve enhanced health and well-being in the province. By building connections to support Alberta's health research and innovation ecosystem, we help accelerate research into care. We also provide leadership for Alberta's health research and innovation enterprise by directing, coordinating, reviewing, funding and supporting priority health research and innovation activities.

When Albertans ask: what do we get for our support of health research and innovation, we can show the progress being made towards health, social and economic impacts using our [research to impact framework](#) (Figure 1). This framework, which is systematically used to guide the evaluation of Alberta Innovates health research investments, enables us to assess whether the organizational and funding activities are relevant (strategically aligned; meet the needs they are trying to address), effective (meet our mission; achieve their objectives and outcomes) and efficient (timeliness; maximize cost to benefit). It also helps us to identify areas of strength and opportunities for improvement. With this evidence, we can make transparent and inclusive strategic decisions that optimize the benefits of our publicly-funded investments in health research and innovation provide to the province.

Each one of us plays a part in advancing the research and innovation initiatives that have the potential to transform our economy, health and health care. Together, we will be even better.



FIGURE 1  
Alberta Innovates Health Research to Impact Framework



# IMPACTS

Alberta Innovates health research and innovation activities (formerly provided by Alberta Innovates - Health Solutions) are broadly grouped into the three core approaches of strategic investments, provincial platforms, and partnerships and collaborations (Figure 2). These approaches and their associated activities are frequently complementary and additive in nature, with one activity often contributing to the success of another. This report features the progress and impacts achieved through current funding mechanisms and initiatives. We also actively supports research and innovation initiatives administered through other organizations; these impacts are subsequently reported by those organizations and are not within the scope of this report.

FIGURE 2  
Health Research and Innovation Investments: 2015-16





# Strategic Investments

## WHAT ARE THEY?

Strategic investments provide funding support to collaborative, multidisciplinary research and innovation activity in priority areas of health that range from the lab to the bedside to the community. Examples include understanding the role that a specific cellular mechanism has in a disease, rolling out new life-saving stroke care and enhancing patient safety by combating hospital borne infections.

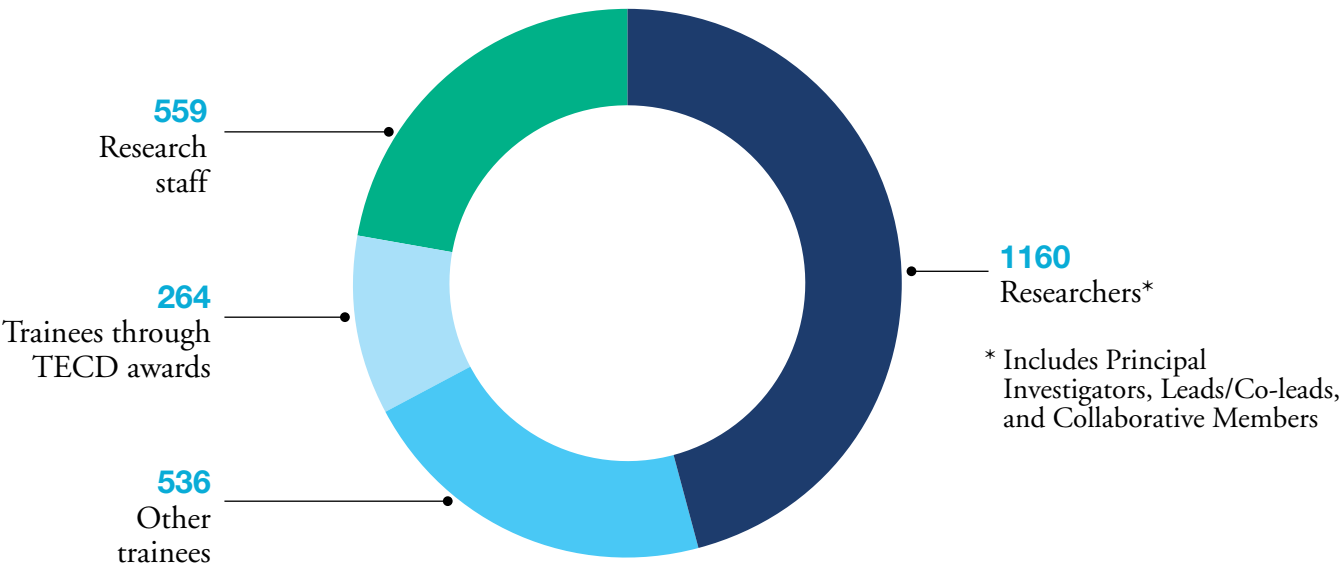
Alberta Innovates strategic health investments have been expanded by working with partners in several sectors. This includes collaboration with Alberta Health to fund community-based cancer prevention through the Alberta Cancer Prevention Legacy Fund (ACPLF) and a funding partnership with Alberta Health Services that supports the activities of the Strategic Clinical Networks (SCNs) focused on improving patient care and value for money in Alberta’s health system.

The two broad groups of strategic investments we offer are Health Research Funding and Training and Early Career Development (Appendix B).

## WHAT IMPACTS ARE WE MAKING?

Alberta Innovates continues to be a major funder of the people who drive health care research and innovation in the province. Highlighted in this report are 350 health grants and awards in 2015-16, representing an investment of \$35.1 million. Impact information for these grants and awards is collected annually through our electronic impact data collection system (Researchfish) that was initially implemented in 2014-15. Only a portion of our strategic investments report through this system due to a phased implementation. These grants and awards directly and indirectly supported 2,519 researchers, trainees and research staff during that period (Figure 3). These investments help grow and maintain Alberta’s human capacity to meet continued and emerging health needs, within and outside of Alberta.

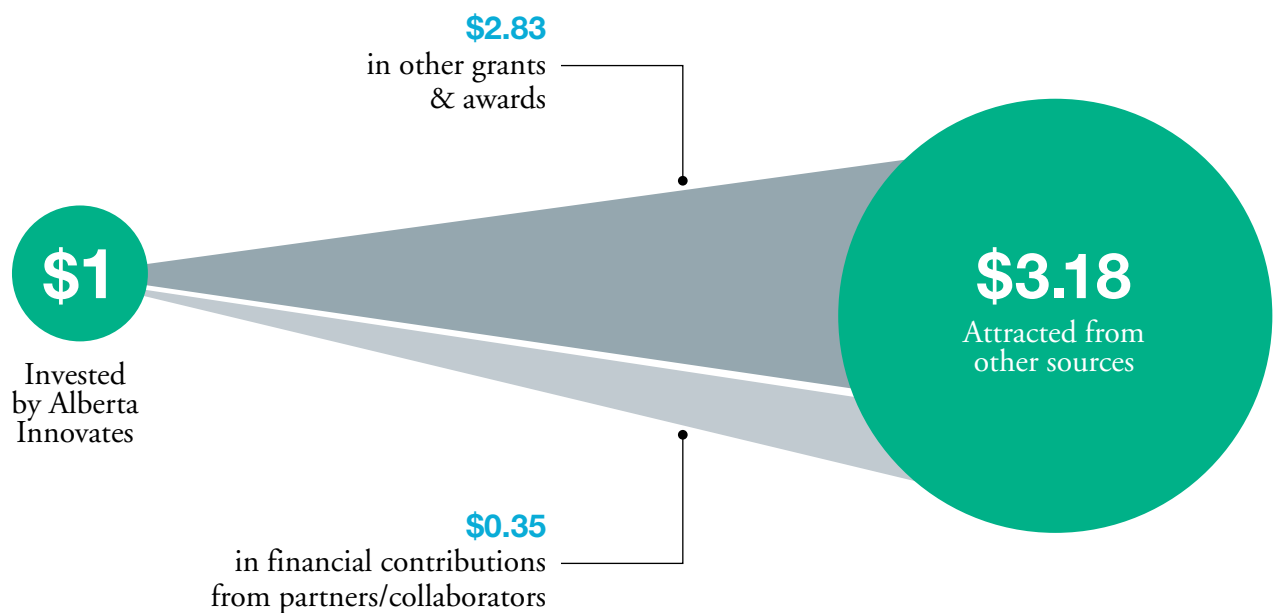
FIGURE 3  
Investing in Human Capacity



Other organizations also recognized the high caliber of research being conducted by our funded researchers and trainees. These individuals attracted an additional \$120.1 million in research funding in 2015-16 from other funding sources; this is an additional \$2.83 in funding for every \$1 invested in them by Alberta Innovates (Figure 4; also see Appendix A). Several also received direct financial contributions from their research partners and collaborators. Of the 527 partners and collaborators that our researchers and trainees were working with, 8 percent had directly contributed \$14.9 million to our funded research projects.\*

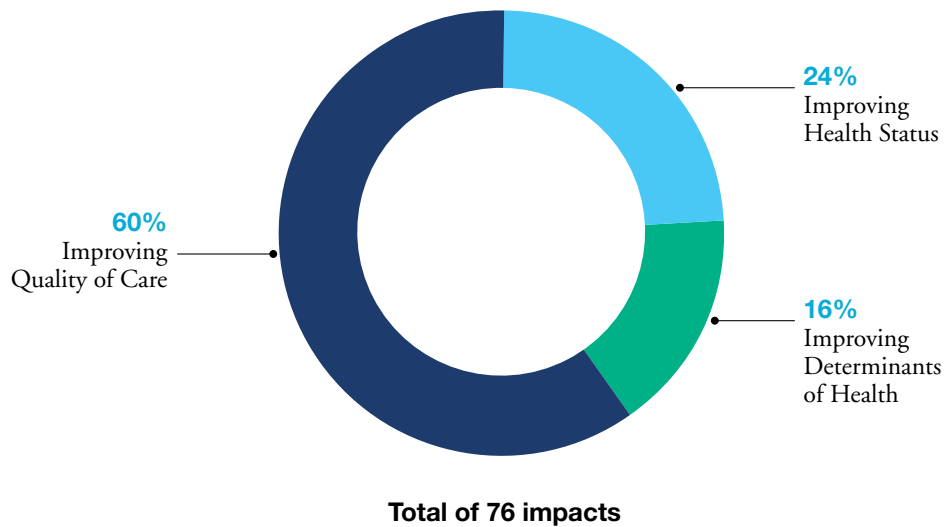
Despite being in the early stages, our funded research projects are already contributing to health and health-related impacts. Twenty-five (28 percent) projects are impacting health status, determinants of health and quality of care (Figure 5). This consists of 76 reported impacts in these three areas (Appendix B).

FIGURE 4  
Our Growing Strategic Investments



\* The number of partners/collaborators making direct financial contributions, as well as the total value of contributions, is likely underestimated as 29 (6 percent) of partnerships/collaborations were bound by contractual confidentiality.

FIGURE 5  
Enhancing the Health of Albertans



## Improving Quality of Care for Patients and Reducing Costs

In our 2014-15 report, we highlighted how an Alberta Innovates research group led by Drs. Leah Gramlich and Gregg Nelson piloted international guidelines for Enhanced Recovery After Surgery (ERAS) for colorectal surgeries at two Alberta hospitals ([read more here](#)). ERAS guidelines promote pre- and post-surgical practices to improve patient recovery times and reduce complications after surgery.

The success of the ERAS pilot led Alberta Health Services to provide \$1.63 million to expand ERAS to a total of nine sites in Alberta and to three additional types of surgery. Drs. Gramlich and Nelson now lead a team of approximately 20 physicians and site leaders that will make ERAS the new standard of care across the province.

The researchers also developed two new ERAS guidelines for the surgical treatment of female cancers that are attracting international recognition. The guidelines are the [two most downloaded guidelines](#) in the journal of Gynecologic Oncology.

*Gramlich and Nelson are funded by a [Partnership for Research and Innovation in the Health System \(PRIHS\)](#) award, and are affiliated with the [Diabetes, Obesity and Nutrition](#) and [Surgery Strategic Clinical Networks](#).*

The researchers evaluated six ERAS sites in Alberta and for 1,295 colorectal surgeries, estimated **\$3.4-\$7.6 million in total cost savings** to the health system. This is a savings of **\$2,600 to \$5,900 per patient**.

Patients also had better health outcomes after surgery, spending less time in hospital and having fewer complications and re-admissions.

Additionally, there are 46 health impacts in the form of medical products, interventions and clinical trials. Two-thirds of these were focused on therapeutic interventions and management of diseases and conditions (Figure 6). These were at various stages of development ranging from initial discovery in the laboratory, to clinical trials with patients, and to wide-scale adoption in the health system (Figure 7). This diversity reflects the complexity of

health research and the different stages of discovery and testing that are necessary to ensure safety, effectiveness and efficiency before potential adoption into the health system. To help increase adoption (as appropriate) (Figure 7), we are working on a number of strategies and partnerships that aim to increase and accelerate impact by moving research and innovation into practice (see Partnerships and Collaborations).

## Reducing Death and Disability by Revolutionizing Stroke Treatment

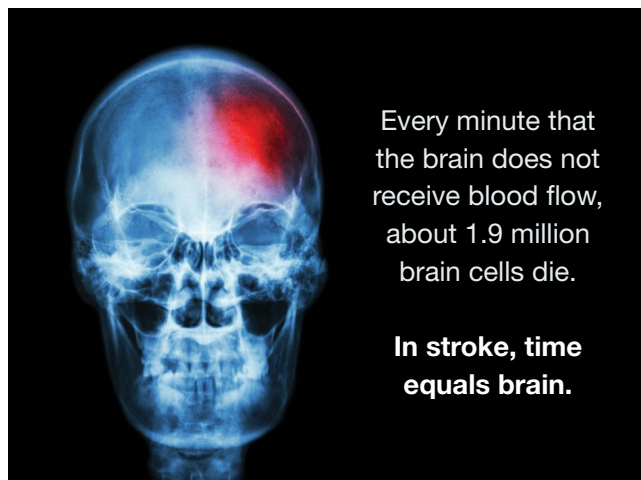
Stroke is the leading cause of serious long-term disability in adults and costs the Canadian economy \$3.6 billion a year in physician services, hospital costs, lost wages and decreased productivity. Strokes are caused by a blockage of blood flow in the brain. They can range in severity from mild with rapid recovery to severe with profound disability or death. Door-to-needle time is the length of time it takes for a stroke patient to be treated once they arrive at hospital. A team of Alberta researchers is working to decrease this time.

The **Quality Improvement – Clinical Research (QuICR)** team aims to reduce door-to-needle time to 30 minutes, and they are closing in on their goal. Prior to QuICR, most Albertans received treatment about **70 minutes** after arriving at a hospital. The average door-to-needle time is now **37 minutes** across all 17 stroke hospitals in Alberta thanks to the collaborative efforts of health care providers. The QuICR team's approach to reducing this time involves ongoing [education, planning and sharing of information](#) about actual door-to-needle times with health care providers.

The [ESCAPE trial](#) was part of the QuICR research program, in which the team developed a new treatment for acute stroke care. This treatment was shown to reduce the severity of disability by 30 percent and the death rate by 50 percent. This research set the international standard for stroke care and has been confirmed in related clinical trials. All major health systems internationally are adopting this treatment approach.

*The QuICR team is supported by a CRIO Team grant and is led by Drs. Michael Hill, Ashfaq Shuaib, Andrew M. Demchuk and Thomas Jeerakathil.*

For more information on how the team is working to achieve a 30 minute door-to-needle time: [ucalgary.ca/quicr](http://ucalgary.ca/quicr) and [ualberta.ca/quicr](http://ualberta.ca/quicr)



**[The results of the ESCAPE trial were published in the high impact New England Journal of Medicine.](#)**

This article has since been cited by 600 documents from 53 countries, tweeted 105 times, and featured in 30 international mass media stories.

FIGURE 6  
Progressing to Health Impacts through Medical Products,  
Interventions and Clinical Trials

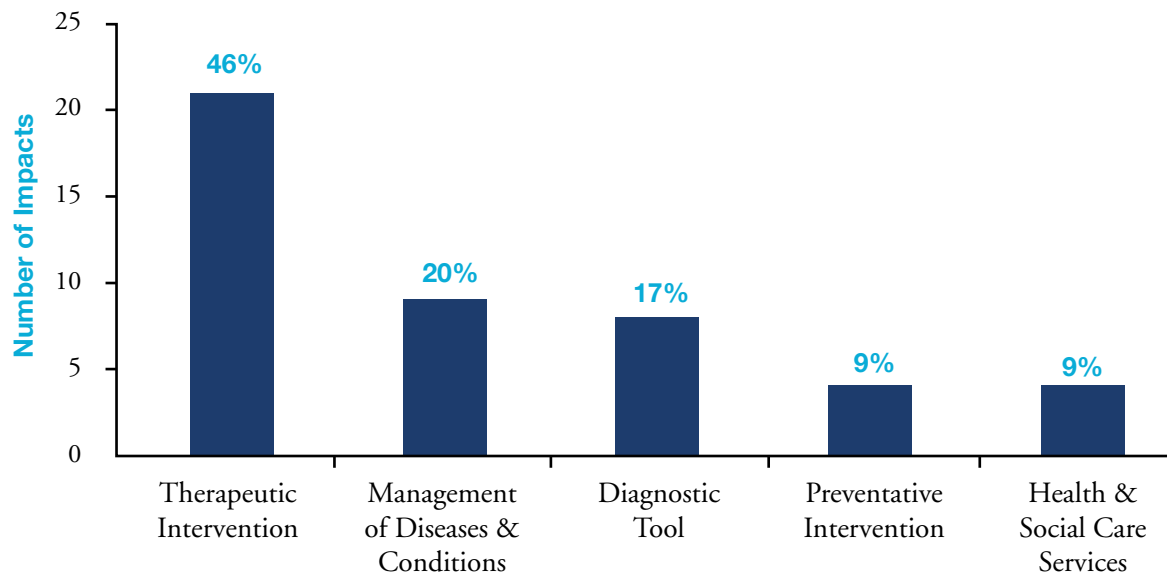
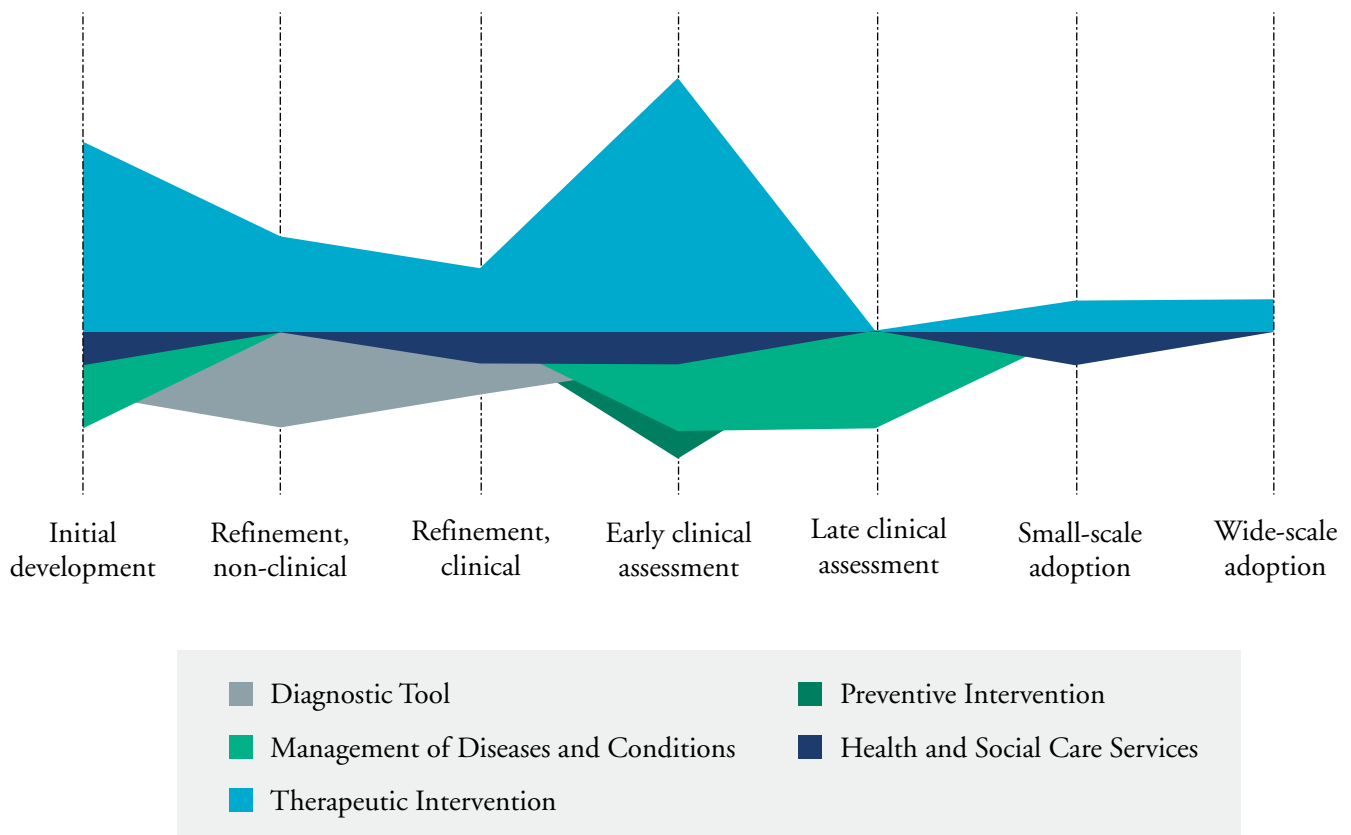


FIGURE 7  
Development Stage of Medical Products, Interventions and Clinical Trials







**66%**  
of our researchers  
engaged with  
industry partners  
and end-users

Our funded researchers and trainees are working with many organizations outside of academia to further advance their research and transfer it to others. One important way to transfer knowledge with industry partners and end-users is through engagement with industry itself.<sup>1</sup> In 2015-16, 66 percent of our researchers reported engaging with industry partners and end-users. The purpose of these engagement activities were to develop the research idea, question or protocol (40 percent); assist with implementation of the project or data collection (20 percent); help with interpretation of the results (12 percent); and for knowledge translation or exchange (28 percent). Academic-industry interactions tend to be broader than those conducted without industry engagement and often seek to generate mutual benefit for each partner.<sup>2</sup> Non-academic organizations can benefit by receiving expertise from researchers about new ideas on application-oriented issues, solving problems and suggesting solutions. At the same time, researchers often benefit by accessing resources relevant to their research activities (e.g., additional funds, equipment, and support for students) and accessing real-world learning opportunities such as field-testing.

Commercialization activities like patenting and licensing of inventions is another means through which researchers foster links with industry and facilitate the transfer of technology.<sup>2</sup> Commercialization is also an early example of how researchers contribute to economic and societal impact because it constitutes more immediate and measurable market acceptance of the products of academic research.<sup>3</sup> In 2015-16, Alberta Innovates researchers and trainees had 11 intellectual products (one granted patent, four published patent applications, and six copyrights). They also established three spin-out companies.

In addition to industry, funded researchers and trainees work with a multitude of partners and collaborators in many sectors. Nearly 60 percent of the 527 reported partners and collaborators are outside of the academic/university domain (Figure 8). Sixty percent of the time our researchers and trainees are also keeping things local by leveraging the expertise and resources of Alberta-based organizations (Figure 9), with the remaining 40 percent putting Alberta's research on a bigger stage (Figure 10).

## Supporting the Next Generation of Researchers & Entrepreneurs



Scott Wong (Alberta Innovates Graduate Studentship in Health) is part of a team of graduate students that **launched Nomadogen Biotechnologies Inc.** in 2015. The company is using cell therapy and genetic engineering to develop a technology with the potential to become a new way to treat brain injury and disease – one that does not require surgery.



Dr. Ryan Lewinson (Alberta Innovates Clinician Researcher) has **patented an innovative system** to prescribe orthotics for patients with knee pain. This cost-effective and accessible technology can enhance patient outcomes by ensuring the right patient gets the right orthotic.

FIGURE 8  
Partnering and Collaborating with End Users of Research

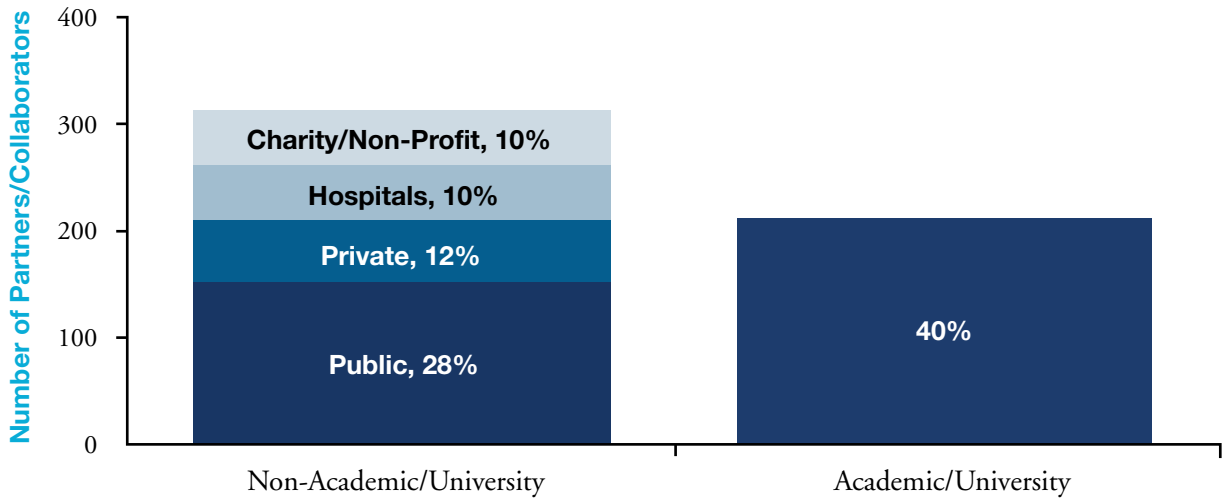


FIGURE 9  
Partnering and Collaborating Across Canada



FIGURE 10  
Partnering and Collaborating Around the World



Realizing the broader value of Alberta Innovates funded health research requires our researchers and trainees to translate their research findings into health, social and economic impacts. A key pathway to achieving effective translation is engagement with various public and private sector information users, including patients and the public. In 2015-16, our funded health researchers and trainees completed 1,464 engagement activities and 46 percent of these were at national or international levels. Presentations (64 percent), formal working groups and expert panels (12 percent), and workshops or other similar events were the most frequent types of engagement activities undertaken (64 percent, 12 percent and 11 percent, respectively).

# Reducing the Burden of Disease Through More Effective Use of Existing Resources

Chronic diseases such as cardiovascular disease (CVD) place a heavy burden on patients as well as the health care system. CVD is the leading cause of disability and death worldwide and costs Canadians \$21 billion each year in healthcare costs, lost wages and productivity<sup>†</sup>. Individuals can delay the onset of CVD by as much as 14 years by adopting healthy behaviours and better managing their major risk factors such as high blood pressure, high cholesterol and/or blood sugar levels, and tobacco use. Primary health care providers play a key role in helping individuals make these changes through education and support as well as by monitoring their CVD risk factors and providing feedback.

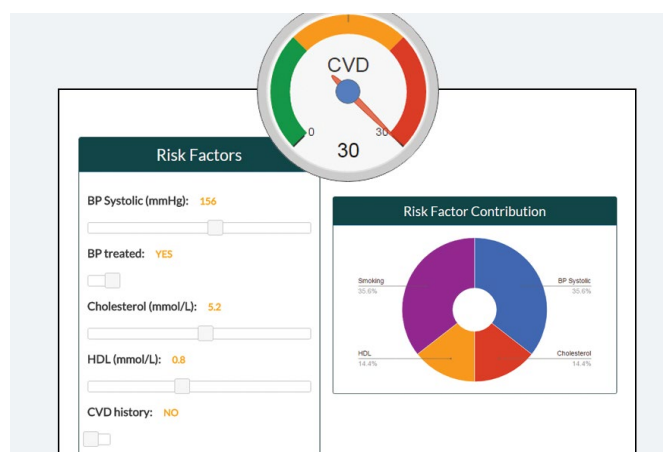
In 2010, the estimated financial burden to Albertans of treating high blood pressures and its consequences was **\$1.4 billion (10 percent of budget)**.

**Through the support of a CRIO Team grant, Rx EACH: The Alberta Vascular Risk Reduction Community Pharmacy Project** aimed to increase patients' access to the health system and reduce the burden of CVD. This was the first large-scale study to assess how community pharmacists can enhance chronic disease management. In Alberta, pharmacists' have an expanded scope of practice which includes medication management, prescribing authority, risk assessment, and ordering and interpreting lab tests. However, despite being highly accessible and often serving as a patients' first point of contact in the health system, pharmacists tend to be underutilized members of the primary health care system.

In the Rx EACH study, over 700 urban and rural participants from 56 communities across Alberta worked with their pharmacists to follow a comprehensive care plan. In three months, researchers found a **21 percent reduction in the risk of having cardiovascular events as well as measurable improvements in all major risk factors** such as blood pressure and tobacco use, when compared to usual care.

The study also showed that collaboration between pharmacists and other primary health care providers improved Albertans' access to effective CVD screening and management in their communities.

<sup>†</sup> [www.heartandstroke.com](http://www.heartandstroke.com)



This CRIO team **developed the Rx EACH Risk Calculator to assess CVD risk**. Individuals can easily see the impact of changing one or more factor on their risk of having a cardiovascular event in the next 10 years.

*This CRIO Team is led by Drs. Brenda Hemmelgarn, Braden Manns, Marcello Tonelli. The Rx EACH study was led by Drs Ross Tsuyuki, Yazid Al Hamarneh, Brenda Hemmelgarn, and Charlotte Jones.*

Funded by Alberta Innovates via the ICDC CRIO Team Grant, Alberta Health, Cardiovascular Health and Stroke SCN, Alberta Health Services, and Merck Canada (for development of educational materials).

For more information visit [epicore.ualberta.ca/rxeach.html](http://epicore.ualberta.ca/rxeach.html).

# Improving the Health of Aboriginal Communities

Prescription drug abuse is a growing public health and safety concern worldwide. Prescription drugs have therapeutic benefits but when misused can lead to addiction, withdrawal, injury, and death.

Alberta has seen a rapid rise in drug overdoses related to fentanyl and is taking action to reduce its harm in our communities, such as making naloxone, which counters the effects of opioid drugs, available without a prescription. Dr. Cheryl Currie, the Alberta Innovates Translational Health Chair in Aboriginal Health and Wellness, has been working with local Indigenous communities to address root causes of the fentanyl and prescription drug crisis that continues to grow in Alberta.

Substance abuse and addictions, suicide ideation and attempts, and other at-risk behaviours are common as youth and adults seek to cope with the trauma associated with such events as the widespread abuse and neglect that took place in residential schools up until 1996. These long-lasting physical, psychological, and behavioural effects make it difficult for several generations of residential school survivors to live together in supportive and nurturing ways.

The 2015 Truth and Reconciliation Commission (TRC) Final Report highlighted the need for parenting programs to undo lessons learned in residential schools and to reintroduce culturally-appropriate, positive parenting. In 2015, Currie worked with the Kainai Nation to launch and evaluate the Strengthening Families program, an evidence-based life skills training program for youth aged 12-16 years and their families. This program helps parents and teens learn ways to use a caring communication style to increase positive family interactions, increase resilience and prevent substance use. To date, 43 families have completed the program, which continues to run at the Kainai Middle School.

The Strengthening Families program has led to improved relationships within Indigenous families. Parents are more confident in their parenting and have noticed changes in their teens and other children. “They help around the house after school. They have changed a lot when it comes to this program.”

Indigenous teens report better anger control, better relationships with their parents, and a better understanding of themselves and their parents. “Because of this program I have realized my mom really loves me.”

***Dr. Cheryl Currie is supported by an Alberta Innovates Translational Health Chair Program award.***

“

It is important to address downstream issues related to this problem, such as preventing overdose deaths and ensuring addicts have access to evidence-based treatments. But we must also think upstream – about the root causes driving this problem so that we can prevent new individuals from developing addictions to these powerful drugs.

**Dr. Cheryl Currie**

”

“

Healthy relationships in families are an important determinant of health. While some members in a family may not have experienced residential school trauma, their wellbeing is linked to the reactions and responses of others in the home. The Strengthening Families program invites parents, teens, and grandparents to come together to learn, to listen to one another and to heal.

**Dr. Cheryl Currie**

”



The primary audience for 57 percent of engagement activities was professional practitioners, highlighting one way in which our investments are working to move research into practice. The more immediate impacts of the reported engagement activities were changes in views, opinions or behaviors (36 percent); plans made for future related activities (24 percent); and requests about (further) participation or involvement (18 percent). Despite a relatively short period of time, 5 percent of engagement activities had already contributed to a decision.

Alberta Innovates researchers and trainees produced 16 artistic and creative products to assist in translating research to, and better engage with, their information users. Half of these products were in the form of videos or podcasts with others included creative writing, artwork and images. Additionally, 13 software and technical products were developed, the most common forms being web tools/applications (46 percent) and software (31 percent).

Policy decisions can make substantial contributions to improvements in health and health-related activities over time. In 2015-16, our researchers and trainees achieved 104 influences on policy. Eight percent of these influences were citations in key policy documents and the remaining 62 percent were on policy setting processes (Figure 11). These policy influences – 38 percent of which extended outside of Alberta – had produced 63 known impacts in 2015-16 (Figure 12).

## Engaging Youth to Generate Social Impact



Natural disasters such as floods and fires are significant life events that affect community members in different ways. The **Alberta Resilient Community (ARC) research project** ([arcproject.ca](http://arcproject.ca)) is finding innovative ways to empower youth to use their voices to generate positive social change in their communities after a natural disaster. ARC researchers supported a group of Alberta youth in telling their stories of recovery in the wake of the 2013 floods in southern Alberta.



## Supporting the Next Generation of Researchers & Entrepreneurs

The research findings of Dr. Shannon MacDonald (Alberta Innovates Clinician Fellowship) on a new single injection vaccine are being used by Canada's National Advisory Committee on Immunization (NACI) to inform provincial and territorial immunization policies.

# Reducing Injury and Health Costs Through Research-Informed Policy Change



Enjoying an active lifestyle has many benefits for the thousands of youth between the ages of 11 and 17 who play hockey in Alberta. However the sport is not without risk of injury and concussions. Body checking for youth playing non-elite hockey has been a focus of debate and has resulted in many calls for policies aimed at improving player safety.

A collaborative research program led by Drs. Carolyn Emery and Brent Hagel evaluates changes to body checking policies across Canada to understand how they affect concussion and injury risk as well as in-game performance. **The Alberta Program in Youth Sport and Recreation Injury Prevention** is also assessing the economic impact of these policies on the health system.

Several policies have been informed by this research program, which found evidence that there is a 300-400 percent increased risk of concussion and injury with body checking and that delaying body checking until Bantam level (ages 13-15) does not lead to higher injury rates. Specifically, Hockey Alberta eliminated body checking at the Pee Wee level (ages 11-12) in 2013 while Hockey Calgary and Hockey Edmonton eliminated body checking for youth playing non-elite hockey at the Midget level (ages 15-17) and below for the 2016-17 hockey season.

*The Alberta Program in Youth Sport and Recreation Injury Prevention is supported by a CRIO Program grant.*

For more information, visit the [Sport Injury Prevention Research Centre Website](#) or follow them [on Twitter](#). Read more about Dr. Carolyn Emery at [ucalgary.ca/knes\\_info/profiles/carolyn-emery](http://ucalgary.ca/knes_info/profiles/carolyn-emery).



Researchers found that in one year, **4,199 children and youth visited emergency rooms** in Alberta for hockey-related injuries and concussions.

In Alberta, changes to body checking policies are estimated to have **prevented 1000+ injuries and 400+ concussions.**

The work of this research group **informed the International Olympic Committee consensus statement on youth athletic development.**

This document has been cited 23 times internationally.

FIGURE 11  
Influences on Policy, Practice, Patients and the Public

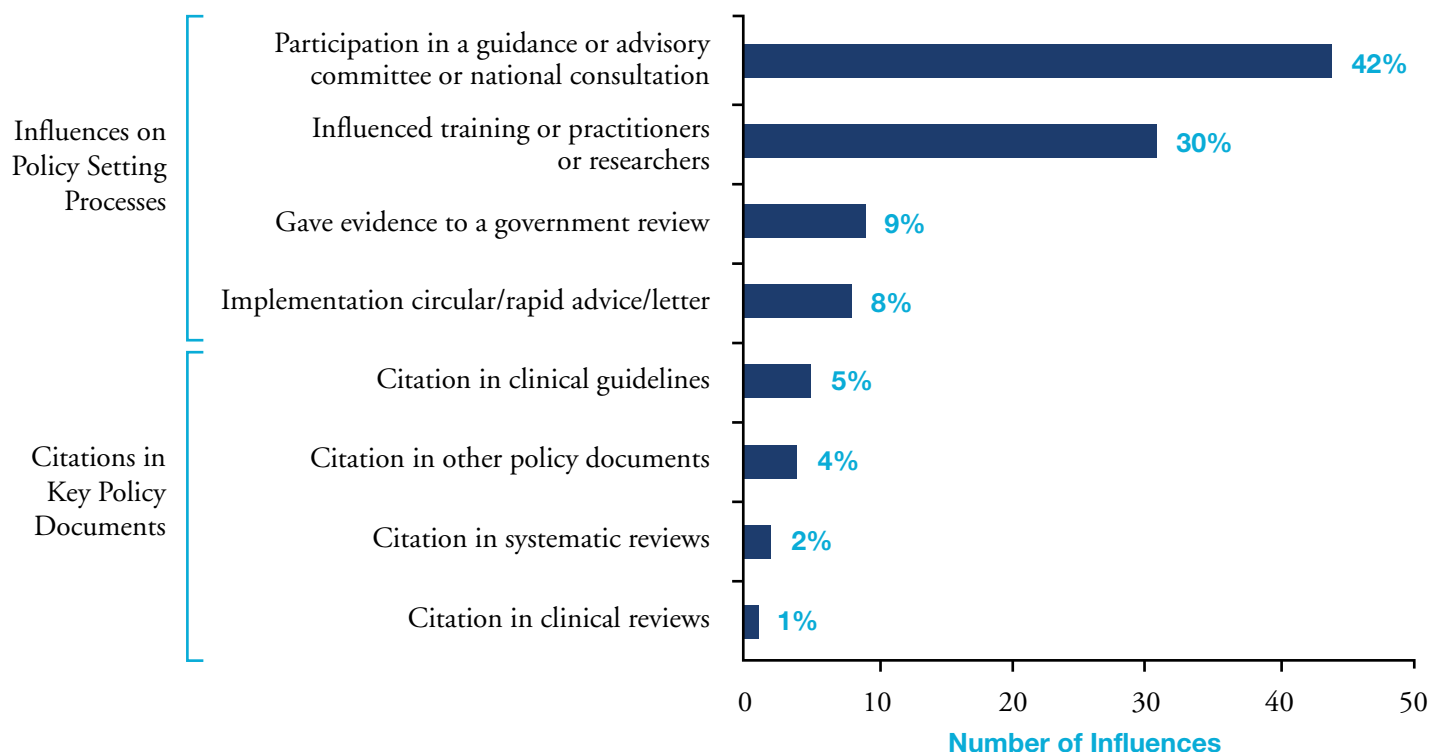
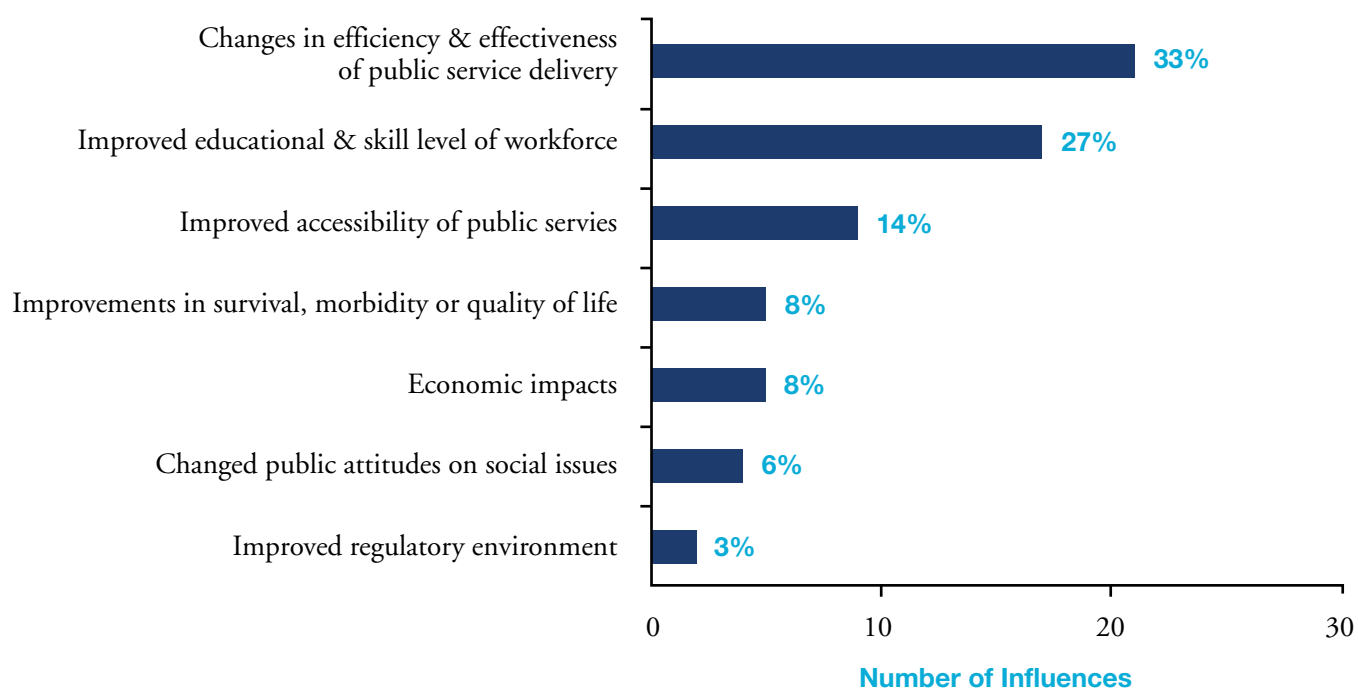


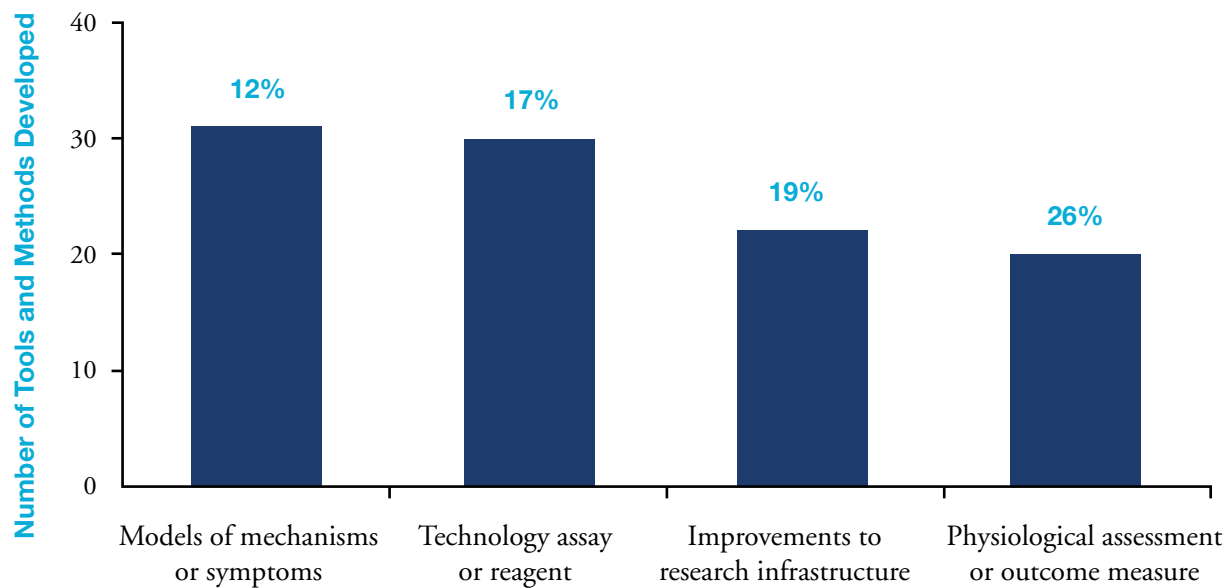
FIGURE 12  
Impacts of Influences on Policy



Strategic investments in the people who are at the heart of Alberta’s research and innovation community also assist them in continuing to achieve great things. This is partially reflected through the 314 awards and recognitions they received from other organizations. Of these, nearly 80 percent were at national and international levels (134 and 114 awards, respectively). They also shared their work through 1,128 publications, 81 percent of which being peer-reviewed journal articles. Our researchers and trainees also developed 117 research tools and methods (Figure 13) as well as 75 databases and models. To benefit others, 28 percent (n=53) of these new developments have already been shared with other research groups.



FIGURE 13  
Research Tools and Methods



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Alberta Innovates is driving research into innovation in the health system to help achieve health, economic, and social impacts. By working as a health research and innovation system connector, we are helping build capacities and capabilities that make health research and innovation in Alberta more coordinated, integrated, efficient and productive. The mechanisms being used to increase impact are the creation of Provincial Platforms (the necessary capacities for research and innovation success) and innovation initiatives (the required activities and capabilities as built through Partnerships and Collaborations) which, when combined and aligned, link the entire research to innovation value chain in Alberta.

Together, these mechanisms can accelerate the realization of impacts, including: health outcome improvements; bending the cost curve in the health system; social impacts around enabling and promoting community research; providing timely access to critical health and health related data; and, fostering partnerships and collaborations which take an holistic approach to improved health outcomes by factoring in the social determinants of health. It is clear that an innovative health system (informed by the latest evidence generated from research and innovation) will be key to providing the best tools and methods for care while managing costs to maximize outcomes. Such a system when functioning well will be able to support continued research and innovation to improve care as well as serve as a backbone for health-based industries in Alberta.

## Provincial Platforms

### WHAT ARE THEY?

The major support and services challenges that are faced by health research and innovation activity in the province are being addressed with Alberta Innovates investments in Provincial Platforms. By fostering these enabling systems that support discovery and mobilization of knowledge into practice, we are increasing the success of research and accelerating new knowledge and its applications into care. These platforms will help us shorten the estimated 17 year lag between drug discovery and commercialization and the 17 year process it can take to move research evidence into the real world where it can improve health and saves lives.<sup>4, 5, 6</sup>

Key focus areas for provincial platforms have been integrating and making available secondary use health data; creating research and care that puts the 'patient-first'; and streamlining processes for ethics review and clinical research. These Provincial Platforms and the diverse connections that underpin them optimize the ability of our health research and innovation system to identify and respond to Alberta's shifting health needs.

### WHAT IMPACTS ARE THEY MAKING?

#### Secondary Use Data Platform (SUDP)

Alberta has over approximately 1,000 health-related databases and the Secondary Use Data Platform (SUDP) intends to bring them together in one mechanism to accelerate medical research, support innovation and strengthen our health care system. Without a solution, data processes related to privacy and security will continue to delay access to research and quality improvement data, resulting in lost opportunities for improvements and innovation in health and the healthcare system. Current redundancies in the technology and databases that support research will also continue to cost the health system tens of millions of dollars. These costs could be reduced through collaboration, improved process and shared information.



As a new initiative, the SUDP is laying the necessary groundwork to achieve its intended impacts of improving the availability of and access to secondary use data; informing health sector decision-making; and supporting future health research, development, and innovation in the province. In 2015-16, Alberta Innovates led a provincial partnership of more than 60 members and 17 organizations in discussions around an approach to create a secondary use health data repository in Alberta. The SUDP worked with numerous organizations to understand what big data services and technologies will be required for advanced integration and linkage of secondary use health and health-related data. Members of the SUDP also engaged with health organizations and research groups to increase awareness of its activities and the value of using health and health-related data as part of Alberta's overall strategy to create a high-performing, learning health system.



### **SUDP is launching five demonstration projects to show how data integration delivers value to Albertans**

This initial groundwork led to the development of [five demonstration projects](#) that aim to provide early evidence of the value of integrated data. These projects will also test the new governance and business models under which data content and access will be managed. Launching in 2016-17, each demonstration project will address a problem identified by data users and work to liberate aggregate data currently unavailable to health system stakeholders and the public. Together, they will show how data integration delivers value to Albertans.



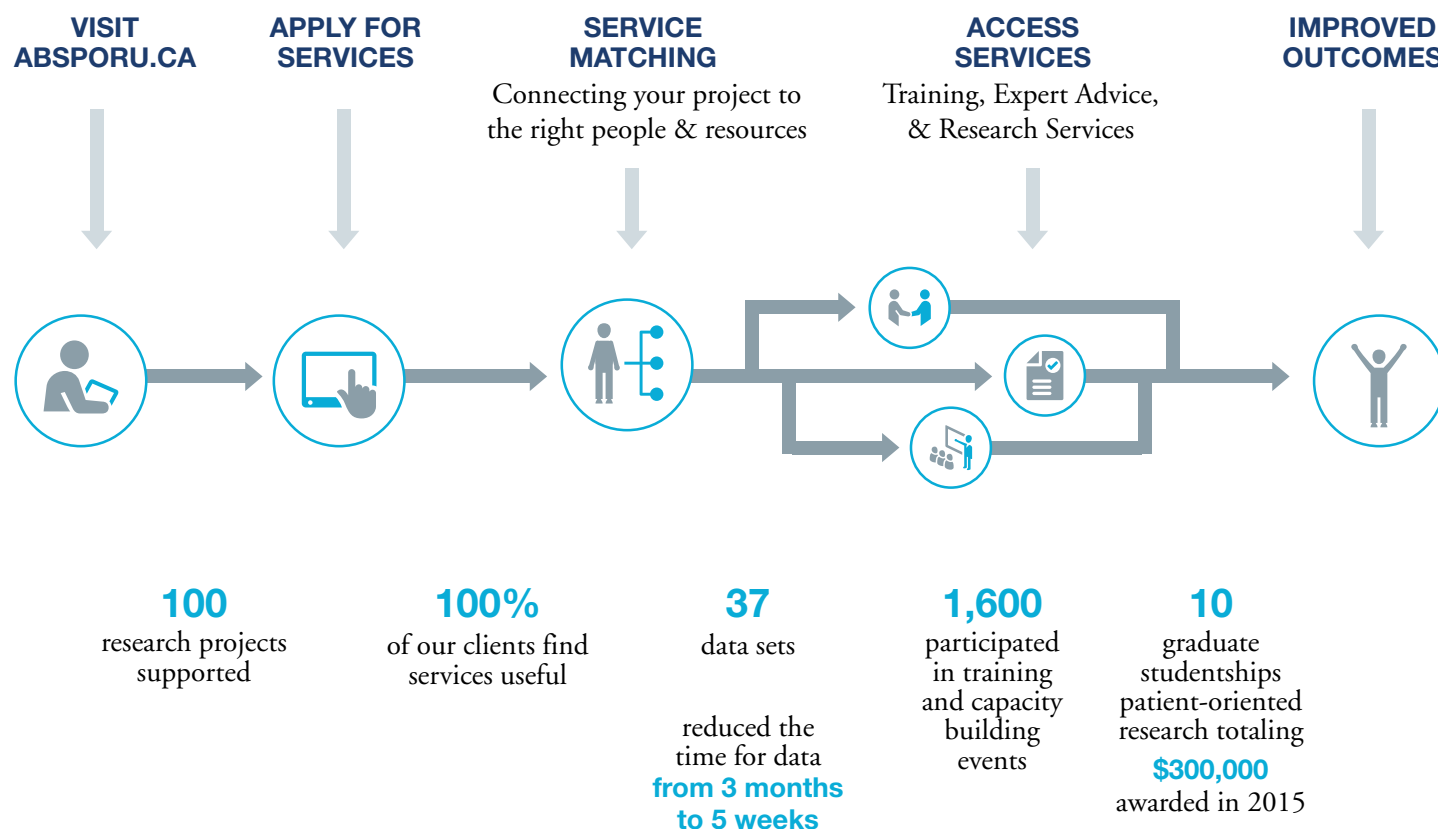
### **AbSPORU: The Alberta Strategy for Patient Oriented Research (SPOR) Support for People and Patient-Oriented Research and Trials (SUPPORT) Unit**

The Alberta SPOR SUPPORT Unit (AbSPORU) is a five year, \$48 million federal-provincial partnership between Alberta Innovates and the Canadian Institutes of Health Research (CIHR) launched in 2014. It aims to accelerate patient-oriented research in Alberta and the Northwest Territories by connecting researchers and students with a network of training, expert advice and research services with a patient perspective. By increasing the quantity and quality of patient-oriented research, researchers, health services providers and patients will have the information needed to ensure the right patient receives the right care at the right time with the right information. The initiative recognizes that patients want to have a stronger voice in health research. It also understands that by listening and responding to patient priorities, researchers can better help improve patients' health outcomes and health system experiences.

Since 2015, AbSPORU has offered training, services, and expert advice to researchers and students across seven areas of expertise that are readily accessible through a "one stop" online resource (Figure 14).

AbSPORU is enabling new discoveries to happen faster and is helping researchers to gain more timely access to data, critical expertise and services. AbSPORU is well on the pathway to meeting the needs of Alberta's patient-oriented research community.

FIGURE 14  
AbSPORU Services



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As a key stakeholder in my healthcare and that of my children, I am often not in the loop about the management and delivery of the care received. This gap needs to be addressed.

**Patient parent involved in an AbSPORU research project**

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AbSPORU is making a huge difference in our access to data which had previously been very challenging. With the support of AbSPORU, Alberta has been the first of five provinces to provide data and analyses for a national study which will help make mental health services better for patients and families.

**Dr. Carol Adair**

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## Health Research Ethics Harmonization (HREH)

Efficient and effective ethical review processes are vital to a healthy research ecosystem. In Alberta, Alberta Innovates is working in a close partnership with AHS, the College of Physicians & Surgeons of Alberta, Covenant Health, and the Universities of Alberta and Calgary on Health Research Ethics Harmonization (HREH). This initiative is establishing a streamlined, effective, collaborative and integrated model for ethics review of human health research across the three Research Ethics Boards (REBs) designated under Alberta's Health Information Act.



Through the efforts of HREH, research conducted in multiple sites across the province or by research groups that are under the jurisdiction of multiple REBs in Alberta now only require review and approval from one of the three designated REBs. This model will accelerate the start-up of research and eliminate redundancies; changes that can make Alberta a top destination for clinical health research and that can attract more research investment into our province.

Ethical reviews of new research studies in Alberta are now being entirely completed through the use of one of two electronic systems, including researchers' application for ethics review. This decreases the administrative burden on researchers and REB staff while significantly improving the ability to generate reports about the research being conducted in Alberta and the activities of the REBs. This information provides critical insights into the strengths and opportunities for improvement in our ethical review processes. It also helps identify potential gaps between the needs of Alberta's health and health system and current research activities in the province.

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Because of harmonizing ethical reviews, Covenant Health as a provincial organization, need only get one review done regardless of where the site research is being done on, or the partner with whom we are researching. This has created efficiencies in the whole system, saving time and effort of many and supporting researchers as they press forward with our research agenda. One review, accepted by all parties, also demonstrates a trust that is foundational to collaborative work...work creating new evidence that has implications to care for those we serve in Alberta.

**Sheli Murphy, Senior Operating Officer, Covenant Health**

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## Health Research Ethics Board of Alberta (HREBA)

The Health Research Ethics Board of Alberta (HREBA) at Alberta Innovates is one of three ethics boards designated by the Alberta Health Information Act (HIA). These REBs review research protocols to ensure that the rights and safety of participants are protected and that the research meets ethical standards. They ensure compliance with HIA and other national and international regulations and guidelines. Specifically, HREBA reviews all cancer-related research in the province as well as research conducted by individuals who are not based at universities (i.e., community-based research). The research reviewed by the board ranges from international drug trials and new devices to prevention and quality of life studies, such as the effects of exercise on cancer patients.

Having a single point of review for all cancer-related studies in Alberta means that researchers no longer need to obtain ethics approval from multiple REBs when a study is being conducted in multiple sites. This can accelerate the start-up of studies and produce administrative efficiencies.

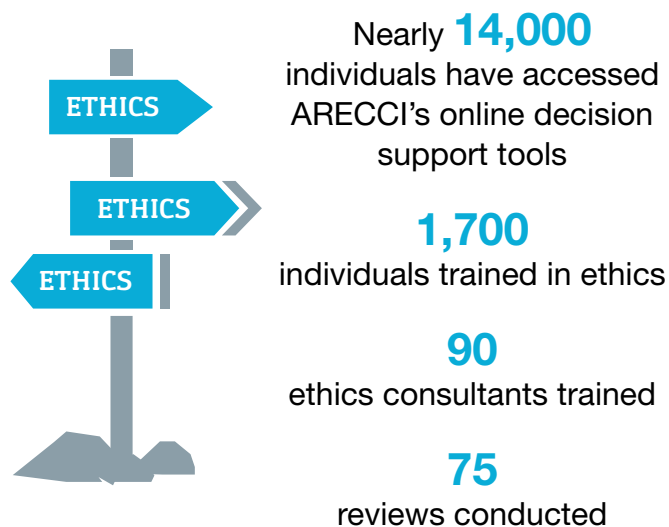
In addition to ethics review, some researchers also require approval from AHS or Covenant Health in order to use these organizations' resources for research purposes (e.g., facilities, equipment, staff, patients or their records). HREBA is helping to accelerate this process by providing AHS and Covenant Health with access to its electronic ethics review system so AHS and Covenant Health administrators have real-time notifications and information about the ethics applications and their status. This new agreement is eliminating duplications and producing greater efficiencies in the research approval process.



## ARECCI: A Project Ethics Community Consensus Initiative

In 2008, the Alberta Heritage Foundation for Medical Research, which later became Alberta Innovates, established a Project Ethics Community Consensus Initiative (ARECCI). Of central importance in ARECCI is the recognition that not all projects requiring ethics review need to be reviewed by a REB.<sup>7</sup> This is because many projects that create knowledge – such as program evaluation, quality improvement, needs assessment and knowledge translation – are not research projects. Nevertheless, non-research projects can still have an ethical risk that can be as great as those of research projects due to the involvement of people, their information, or its sensitive nature.

### ARECCI: MAKING AN IMPACT



ARECCI provides support to project leads in assessing and addressing risks in non-research projects through the delivery of decision-support tools, training opportunities and an ethics consultation service.

ARECCI's openly accessible online decision support tools have been accessed by nearly 14,000 individuals within and outside of the health ecosystem to assist in making decisions about ethical issues in their projects. The *Ethics Guidelines* tool is used for planning and conducting non-research projects and the *Ethics Screening Tool* helps individuals assess the project type, determine its risk category, and identify the level of ethical review required.



With 380 individuals having received ethics training in 2015-16, ARECCI has now trained more than 1,700 practitioners including 1,200 AHS staff through a partnership between ARECCI and AHS. These training sessions assist individuals assess and address the risks involved in their non-research projects using the ARECCI decision-support tools.

Ninety ethics consultants, including 15 in 2015-16, have been trained by ARECCI to provide ethical reviews of non-research projects that pose more than minimal risk to people and their information. Since April 2015, 75 reviews have been conducted.

ARECCI has also assisted organizations within and outside of Alberta in developing policies to protect people and their information, including AHS and British Columbia's Interior Health. Another organization, the Health Quality Council of Alberta (HQCA), has implemented an ethics review process for all projects.

ARECCI is also contributing to efficiency gains in the research and innovation ecosystem by diverting non-research projects from REBs. This facilitates shorter project start-times and reduces the use of REBs' resources in screening out and redirecting ethics applications for non-research projects.

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One of the HQCA values is to apply an ethical lens to our work. All HQCA staff are required to take the ARECCI level one ethics course, and an ethics review process using the ARECCI framework is embedded in our project management cycle.

**Dale Wright, Senior Lead, Project Management, Health Quality Council of Alberta**

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### Alberta Clinical Research Consortium (ACRC)

Clinical trials offer several potential benefits to its participants such as access to new treatments that are not yet available to the public, expert medical care at leading health facilities and the opportunity to assist others by participating in health research.<sup>8</sup> With a global decline in clinical trials, Alberta can better position itself to attract outstanding clinical researchers and clinical research investment through better coordination of clinical trial processes and enhanced alignment with national strategies.

The Alberta Clinical Research Consortium (ACRC), managed by Alberta Innovates, is tackling barriers and building solutions to increase the efficiency of conducting clinical research and clinical trials in the province. The member organizations of ACRC – Alberta Innovates, Alberta Health Services, the College of Physicians and Surgeons of Alberta, Covenant Health, the University of Alberta and the University of Calgary – are leveraging their expertise to collaboratively streamline processes and enhance the capacity for and quality of clinical health research.

In 2015-16, 834 clinical researchers in Alberta were trained in Good Clinical Practice, a CITI Canada program endorsed by the ACRC and provided at no cost to ACRC members through their own organizations and a partnership with Network of Networks (N2). This program focuses on Canadian and American regulations for clinical trials of drugs, biologics and medical devices to enhance the quality of clinical research performed. This training often reduces duplication and costs for clinical research sites and sponsors as several pharmaceutical companies accept this training as equivalent to their own Good Clinical Practice training.

An updated version of the [ACRC Glossary and Common Terminology](#) was released in 2015-16. The use of consistent terminology is necessary for streamlining province-wide processes and several clinical research terms have been adopted by our universities and healthcare system.



**The [EDGE online system](#) shares information about the number and location of trials and areas of expertise in the province in real time.**

The ACRC is building Alberta's clinical research infrastructure through the implementation of the EDGE Clinical Research Management system in 2015-16. This system promotes inter-organizational communication and increases the efficiency of setting-up clinical studies in Alberta across disease areas and in all clinical research areas. It also enables the ACRC to provide timely information about the number and location of trials and areas of expertise in the province; this evidence is invaluable when decisions are being made about resource management and future directions.

In 2015-16, the ACRC identified the most important measurements of clinical research activity in Alberta and how to measure them. This will enable Alberta to identify strengths and opportunities for improvement in our clinical research system. Through this work, Alberta is being recognized as a national leader in the measurement of clinical research activity and a "go-to" province for clinical research and trials.

## Performance Management and Evaluation (PME)

Research impact assessment (RIA) is fundamental in delivering effective research and innovation and in measuring the success of related investments. The [Performance Management and Evaluation \(PME\)](#) platform at Alberta Innovates is enhancing the overall capacity of research and innovation impact assessment in Alberta and around the world through mentoring and regional, national and international training programs and workshops.

Co-founded by PME at Alberta Innovates, RAND Europe and the Agency for Health Quality and Assessment of Catalonia (AQuAS) in 2013, the annual [International School for Research Impact Assessment \(ISRIA\)](#) fosters the science of RIA across all fields of research to support the sustainability of research systems. During the first three years, 197 individuals from more than 15 countries attended ISRIA on three continents, including 98 individuals from six countries when hosted by Alberta Innovates in Banff, Alberta in 2014.



**Last year, we trained close to 425 people in research impact assessment through ISRIA, regional training courses and customized workshops.**

The high demand for RIA training in Alberta and Canada led PME to launch a regional affiliate of ISRIA in 2015 which was attended by 60 individuals. The [annual Training Course on Health Research Impact Assessment](#) is a practical course tailored to building local capacity on how to assess the impact of health research and innovation through evidence-based practices and practice-based evidence.

In 2015-16, 363 participants attended 10 customized RIA workshops that PME was invited to deliver throughout Canada and internationally. This included co-hosting a national forum with the National Alliance of Provincial Health Research Funders (NAPHRO) on the impact framework developed by the Canadian Academy of Health Sciences.





# Partnerships and Collaborations

## WHAT ARE THEY?

We recognize that by working together with partners, we pool expertise, leverage resources and maximize the health, social and economic impacts of research and innovation. By brokering linkages that bring different organizations and people together to overcome barriers within the life science innovation system, Alberta Innovates is working to accelerate the process of putting health solutions into practice where the needs of Albertans are served. These linkages also stimulate the exploration of cross-sector opportunities to expand and optimize the use of research findings and achieve impact. Through partnerships and collaborations, we attract additional investment to Alberta to support innovation, foster new innovative technologies and solutions, contribute to the creation of a thriving health sector that promotes economic diversification, and ultimately enhance the health and well-being of Albertans.

Alberta Innovates collaborates with partners in the health system, publicly-funded post-secondary institutions, small and medium-sized enterprises (SMEs), multinational enterprises (MNEs), government and others to translate research into solutions, to target those solutions to meet the identified needs of the health system and to create an environment for innovation that will make a difference in the lives of Albertans<sup>‡</sup>.

## WHAT IMPACTS ARE WE MAKING?

Alberta Innovates and our partners are working together to maximize the returns on our health investments through the leveraging of expertise and resources, including dollars. By the end of 2015-16, an additional \$3.55 was committed by our partners for every \$1 invested by us in partnership initiatives.



**Through Partnership and Collaboration initiatives, an additional \$3.55 was committed by others for every \$1 invested by Alberta Innovates.**

<sup>‡</sup> Note that not all Alberta Innovates and the former Alberta Innovates - Health Solutions industry partnerships and collaborations are described in this report. Funds have been received and activities are underway for all opportunities. However, as some have been recently implemented, it is too early to report their impacts.



## Translating Research into Solutions

Through partnerships, Alberta Innovates supports activities focused on translating research into solutions that have a strong potential for commercialization and healthcare transformation. These solutions include innovative products, tools, therapies and services. Active 2015/2016 partnership examples include:

➤ **Alberta/Pfizer Translational Research Fund** supports the translation of promising research into clinical applications. Alberta Innovates partnered with Pfizer Canada, Western Economic Diversification Canada and the government of Alberta to establish this research fund. The fund supports the translation of leading research at Alberta post-secondary institutions into the development of 13 new innovative diagnostic tests and therapies for:

- Cancer
- Brain Imaging
- Asthma
- Multiple Sclerosis
- Huntington's Disease
- Cardiovascular disorders
- Pain
- Blood typing
- Metabolomics

The research groups funded through Alberta/Pfizer grants reported leveraging an additional \$17.6 million in funding to contribute towards their innovation development efforts.

➤ **Alberta/Novartis Translational Research Fund Opportunity** was developed in partnership with Novartis Pharmaceuticals Canada Inc. and the Government of Alberta to support the translation of promising research that has a strong potential to advance multiple sclerosis patient care and research. Four research groups were awarded funding in the latter part of 2015-16 and have recently begun their research activities.

➤ **TEC Health Accelerator**, a partnership between Alberta Innovates and TEC Edmonton, provides commercialization advice to AHS to analyze the commercial potential of new technologies developed within the health system. In 2015-16, seven technologies were assessed and the first AHS spin-out company, MagneTx Oncology Solutions, was established.

## Targeting Cancer in Real Time

An unfortunate side effect when a cancer patient receives radiation to treat a tumour is that the radiation beam also damages surrounding healthy tissue and organs. A linear accelerator (Linac) is used to target a radiation beam to the tumour. The problem lies with the inability to adjust the Linac to a patient's movements – such as breathing – because the precise location of the tumour cannot be seen during treatment. While magnetic resonance imaging (MRI) enables tumours and other soft tissues to be seen, MRI machines disrupt Linacs. Until now, the two could not be placed within ten metres of each other.

Dr. Gino Fallone leads a multi-disciplinary research group that has found a way to combine a Linac and MR imager. Their patented Linac-MR system automatically detects a tumor and precisely guides a radiation beam to the site, adjusting for movement in real-time. Using this technology, healthy tissue is preserved and patients experience fewer treatment side effects.

Combining an MRI with a linear accelerator is a **major engineering achievement** once thought to be impossible

With its ability to “see” tumours in soft tissue, the Linac-MR system could potentially be used for a wide range of cancers, including those of the abdomen. To date, abdominal tumours cannot be easily treated using radiation. If proven to be effective in clinical trials, the Linac-MR system would be a major advancement to provide the best possible treatment for cancer patients. The research group is now exploring ways to use Linac-MR system with leading edge cancer therapies to deliver higher radiation doses across fewer treatment sessions. To support the ongoing development of this technology, this research group raised over \$2.7 million in funding in 2015-2016.

In 2015 and with AHS, Dr. Gino Fallone and Mr. Brad Murray founded MagneTX Oncology Solutions, an Alberta-based spin out company, to commercialize the Linac-MR system (called Aurora-RT) and make this technology available internationally. MagneTX was awarded the 2016 DynaLIFE Dx Health grand prize by TEC Edmonton for the most promising early-stage high-tech company in Alberta.

This highly cross-disciplinary research is being cited in the fields of Medicine, Biochemistry, Physics and Engineering.

***The research was funded by CRIO and the TEC Health Accelerator program.***



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The creation of MagneTX Oncology Solutions is the culmination of over 10 years of research and development. MagneTX is the best way to ensure that Albertans will be able to access this technology now and in the future.

**Dr. Gino Fallone**

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## Targeting Solutions to Meet Health System Needs

New technologies and innovative care models offer the potential to improve patient health and reduce healthcare costs in the long term. However, they often also require high upfront costs and are complex to introduce into the system. Recognizing these challenges, Alberta Innovates has established a number of initiatives to support the health system in undertaking innovation activities in partnership with industry to help drive health innovation that is responsive to health system needs. Highlights of these activities in 2015-16 include:

49

**Companies were engaged in discussions with AHS to address health system needs through partnering initiatives including 28 SMEs and 21 MNEs**

5

**New technologies are being tested and evaluated in the health system, four being SME technologies**

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This initiative offers a truly unique opportunity for industry to collaborate with our health care partners in Alberta, bringing together innovators, clinicians, patients and government to collectively solve challenges facing the health system.

**Brian Lewis, President and CEO of MEDEC**

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- **MEDEC-SCN** is a needs-driven approach within AHS to validate innovative technologies that focus on specific interventions in existing care pathways. This initiative provides an unprecedented opportunity for MEDEC members and other health technology companies to work with Alberta's health system in validating innovations with the potential to improve patient outcomes. The goal is to generate real-world evidence in Alberta that evaluates the value proposition of the technology. As a result of the 2015-16 engagement events, 16 solutions from various large and small corporations were proposed and three were subsequently selected for implementation within AHS in early 2017.



*Dr. Breanne Everett, CEO of Orpyx Medical Technologies Inc.*

- **Accelerating Innovations into CarE (AICE)**, launched in Fall 2015 in partnership with the TEC Edmonton Health Accelerator Program, supports Alberta's health system in partnering with SMEs to assess the value of new technologies in our health system. By generating invaluable evidence on whether a technology provides sufficient improvements in health outcomes and/or cost-effectiveness to warrant investing in its adoption, AICE enables AHS to make evidence-based decisions while SMEs gain critical market evidence that will help them enter health care markets globally. In 2015-16, 28 potential collaborations were explored and funding was awarded to the Diabetes, Obesity & Nutrition SCN to work with two Alberta-based SMEs – Exciton Technologies Inc. and Orpyx Medical Technologies Inc. – in an effort to reduce lower limb amputations in the province by 50 percent. If achieved, this improvement could translate to an estimated savings in our health system of more than \$6.5M per year.



- **CIHR eHealth Innovation Partnership Program (CIHR eHIPP)** is a funding opportunity offered by CIHR to identify patient-oriented eHealth solutions that will improve health outcomes, enhance patient experience, and lower the cost of care along the continuum for seniors with complex care needs in their homes. Alberta Innovates partnered with CIHR to offer a pre-application workshop to bring together the research community and relevant industry partners, as well as to co-fund successful Alberta-based applications. In 2015-2016 two University of Alberta researchers were awarded funding to collaborate with SMEs with digital solutions to help remotely monitor blood pressure in high risk patients in their homes and provide better diabetes care in isolated First Nation communities.



**For every \$1 invested by Alberta Innovates in CIHR eHipp projects for Alberta seniors, an additional \$8 was attracted from CIHR and industry partners.**

- **Alberta 3M Collaboration Fund** was created jointly by 3M Canada Company (3M), Alberta Innovates, and the Ministry of Economic Development & Trade to help establish Alberta as a hub for medical product innovation. In 2015-16 the first validation project was approved to test the effectiveness of a pressure bandage for the care of patients undergoing orthopedic surgery at University of Calgary's Ward of the 21<sup>st</sup> Century.

- **IMPACT 5/65** is a collaboration of Merck Canada, Alberta Innovates, and Alberta Health Services that will help create a better understanding of the needs of vulnerable Albertans for whom conventional health care models have often proven ineffective. Data collection and evaluation for this project are currently underway. With this information, IMPACT 5/65 aims to improve population health, decrease per capita costs of health care and enhance the experiences of high-needs patients in the health system.

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Once the data start rolling in from IMPACT 5/65, we'll have hard evidence to tell us what is working and what isn't. Looking ahead, we're very interested in building a sustainable measurement system province-wide. This is an important first step.

**Stephanie Donaldson, Director, Primary Care and Chronic Disease Management, Alberta Health Services**

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# SUMMARY

This report is a summary of the progress and impacts resulting from research and innovation activities supported by the health funding portfolio of Alberta Innovates (formerly Alberta Innovates - Health Solutions) as reported in 2015-16. It demonstrates that our investments are achieving tangible impact on the health and well-being of Albertans and our health care system.

As a publicly-funded organization, this report provides one source of evidence of the value being delivered to Albertans through our investments. It highlights a multitude of ways that our strategic investments, provincial platforms and partnerships and collaborations are making a difference on the health and well-being of Albertans and to our health system. These achievements reflect the efforts of our researchers and trainees as well as the collective efforts of many public and private organizations.

It is through the building of critical human capacity and infrastructure and the leveraging the expertise and resources that Alberta will best be able to address the health needs of our citizens, both now and in the future.



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# APPENDIX A:

## Data Sources and Timeframes

The Alberta Innovates Annual Impact Report focused on health, 2015-16, reflects information from multiple data sources. The primary source for impact-related data for our strategic investments is Alberta Innovates electronic impact data collection system (Researchfish). The information in this system was expanded since the *AIHS Annual Impact Report: 2014-15* to also include TECD awards as well as additional PRIHS, CRIO and the Translational Health Chair Program grants and awards that were implemented in 2015-16. Due to the structure of data within Researchfish, data reported for strategic investments includes achievements realized between January 1, 2015 and March 31, 2016 (i.e., 15 month period) as opposed to the actual fiscal year of April 1, 2015 to March 31, 2016. Calculation of leverage funding for strategic investments therefore used our investments in these grants and awards for the same 15-month period (\$42.5M). Additional information about the methodology, quality assurance processes, and analysis in relation to this data are available in the *AIHS Annual Impact Report: 2014-15*.

Impact data for Platforms and Partnerships and Collaborations was provided by Alberta Innovates lead representative for the initiative and reflect information from various administrative and program management records. For these initiatives, the data was predominantly limited to progress to impact and the impacts achieved between April 1, 2015 and March 31, 2015. In a few cases, milestones that were necessary to achieve progress to impact are mentioned even if such milestones were reached prior to April 1, 2015.

## APPENDIX B:

### Strategic Investments

Funding Opportunity	Description	Number of Grants/Awards Active in 2015-16
<b>Collaborative Research &amp; Innovation Opportunities (CRIO)</b>	Funding for collaborative research in priority areas for Alberta that engage knowledge-/end-users for the purpose of producing new knowledge and translating that knowledge to improve health and the healthcare system.	
	<p><b>CRIO Team:</b> Enables a large, interdisciplinary team or network of researchers with national or international stature to tackle health issues involving many stakeholder groups. The team must have an experienced leader identified. The research activities must engage knowledge- and/or end-users to encourage uptake of evidence and must be aligned to priority areas of health for Albertans. Includes one grant funded through the Alberta Cancer Prevention Legacy Fund (ACPLF).</p> <p><i>Up to \$1,000,000 per year for up to 5 years</i></p>	<p><b>11</b> <i>(including 1 grant funded through the ACPLF)</i></p>
	<p><b>CRIO Program:</b> Enables a group of interdisciplinary collaborators (three or more) who may already work together to focus on a complex program of health research and innovation that addresses health research needs, gaps or opportunities. The research program must engage knowledge- and/or end-users to encourage uptake of evidence and must be aligned to priority areas of health for Albertans. Includes two grants funded through the ACPLF.</p> <p><i>Up to \$500,000 per year for 5 years</i></p>	<p><b>6</b> <i>(including 2 grants funded through the ACPLF)</i></p>
	<p><b>CRIO Project:</b> Allows a small group of interdisciplinary collaborators (minimum three) to come together with knowledge- and/or end-users to complete a defined health research project with defined deliverables.</p> <p><i>Up to \$250,000 per year for up to 3 years</i></p>	<p><b>20</b></p>
	<p><b>CRIO Project Cancer:</b> Funds cancer research through the ACPLF across the cancer continuum, from causes and prevention to treatment and care, enabling a small group of interdisciplinary collaborators (minimum three) to come together with knowledge- and/or end-users to complete a defined health research project with defined deliverables.</p> <p><i>Up to \$250,000 per year for up to 3 years</i></p>	<p><b>18</b></p>

Funding Opportunity	Description	Number of Grants/Awards Active in 2015-16
<b>Collaborative Research &amp; Innovation Opportunities (CRIO)</b> <i>continued</i>	<p><b>CRIO Population Resiliency:</b> Focuses on developing and strengthening pre- and post-disaster population resiliency and informing readiness planning for future natural disasters and other catastrophic events. This will be achieved by using a collaborative approach to produce new knowledge, coupled with the translation of research findings to knowledge- or end-users for impact on the health of Albertans and/or the health system.</p> <p><i>Up to \$1,000,000 per year for up to 3 years</i></p>	<p><b>2</b></p>
<b>Partnership for Research &amp; Innovation in the Health System (PRIHS)</b>	<p>A funding partnership with Alberta Health Services that supports the activities of the Strategic Clinical Networks focused on improving patient care and value for money in Alberta's health system.</p> <p><i>Up to \$250,000 per year for up to three years</i></p>	<p><b>20</b>  <i>(including 1 grant funded through the ACPLF)</i></p>
<b>Translational Health Chairs</b>	<p>A partnership with Alberta's Comprehensive Academic and Research Institutions to recruit translational health leadership in priority areas to improve health and the health system.</p> <p><i>From \$250,000 to \$600,000 per year for 7 years</i></p>	<p><b>9</b></p>
<b>Training and Early Career Development</b>	<p><b>Graduate Studentships and Postdoctoral Fellowships:</b> support trainees in gaining broad experience in the health research environment to help them succeed in launching careers in academia, industry, government or elsewhere.</p> <p>Graduate Studentships provide funding for individuals enrolled in a thesis-based Master's or PhD program in a health-related research area at an Alberta university.</p> <p><i>\$30,000 stipend and a research and career development allowance of \$2,000 per year for up to 4 years (maximum of 2 years support towards a Master's degree)</i></p> <p>PLUS Option is an optional component offered through the Graduate Studentship Program. It customizes the Graduate Studentship experience by supporting trainees in a way that best suits their career plans. The PLUS can be used to seek training and internships opportunities beyond those acquired through their direct graduate research training, such as business, education, industry, government and/or health policy, within clinical or other health research related environments.</p> <p><i>Up to \$30,000 for one year, and a research and career development allowance up to \$2,000.</i></p>	<p><b>119</b>  <i>(including 16 awards funded through the ACPLF)</i></p> <p><b>1</b></p>

Funding Opportunity	Description	Number of Grants/Awards Active in 2015-16
<b>Training and Early Career Development</b> <i>continued</i>	<b>Graduate Studentships and Postdoctoral Fellowships</b> <i>continued</i> <p>Postgraduate Fellowships provide funding for individuals with a PhD and/or professional health degree (without clinical accreditation in Canada) who have a post-doctoral appointment at an Alberta university in a health professional or health related program.</p> <p><i>\$50,000 per year, and a research and career development allowance of \$5,000 per year for up to 3 years</i></p>	<b>65</b> <i>(including 8 awards funded through the ACPLF)</i>
	<b>Clinician Researcher Training:</b> enables the training of clinician scientists who split their time between clinical training or practice and research. These are individuals with medical training and research experience who develop research questions encountered in practice and translate their findings into care. <p>The MD-PhD Studentship provides support for individuals pursuing combined MD-PhD degrees at an Alberta university.</p> <p><i>\$30,000 per year, and a research and career development allowance of \$2,000 per year for up to 6 years</i></p>	<b>18</b> <i>(including 2 awards funded through the ACPLF)</i>
	<p>The Clinician Fellowship provides support for individuals who have clinical credentials in Canada to pursue graduate and postgraduate research in a health professional or health-related program in Alberta.</p> <p><i>\$70,000 per year, and a research and career development allowance of \$5,000 per year for up to 3 years</i></p>	<b>34</b> <i>(including 8 awards funded through the ACPLF)</i>
	<b>Legacy Training Awards:</b> Although this program closed after Alberta Innovates introduced new programs for Training and Early Career Development in 2012, these trainees received their initial award prior to July 1, 2012 and were continuing to receive funding in 2015-16. <p>Full-time Studentships enabled academically superior students to undertake full-time research training in the basic biomedical sciences or in clinical research.</p> <p><i>\$30,000 per year; Research Allowance value: \$2,000/year. Maximum of 5 years; maximum 3 years of funding available at the master's level.</i></p> <p>Health Research Studentships enabled academically superior students to undertake full-time training in health research.</p> <p><i>\$30,000 per year; Research Allowance value: \$2,000 per year. Maximum of 5 years; maximum of 3 years of funding available at the master's level.</i></p>	<b>20</b>  <b>3</b>

Funding Opportunity	Description	Number of Grants/Awards Active in 2015-16
<b>Training and Early Career Development</b> <i>continued</i>	<p><b>Legacy Training Awards</b>  <i>continued</i></p> <p>MD-PhD Studentships provided an opportunity for exceptional candidates who wished to pursue careers as Clinical Investigators to study for the MD and the PhD degrees simultaneously. Alberta Innovates support was complementary to the formal MD-PhD programs at the University of Alberta and the University of Calgary.</p> <p><i>\$30,000 per year; Research Allowance: \$2,000 per year.  Maximum of 6 years.</i></p> <p>Full-time Fellowships enabled highly qualified doctoral graduates to prepare for careers in medical or health research as independent investigators.</p> <p><i>\$50,000 per year; Research Allowance: \$5,000 per year.  Maximum of 3 years.</i></p>	<p><b>4</b></p>



## APPENDIX C:

### Areas of Health Impact

Health Impacts	Area of Impact	Impacts	
		n	%
Changes in Health Status	Morbidity	7	9%
	Mortality	1	1%
	Quality-Adjusted Mortality	1	1%
Change in Determinants of Health	Modifiable risk factors	7	9%
	Social determinants	1	1%
	Environmental determinants	0	0%
Changes in Quality of Care	Acceptability	9	12%
	Accessibility	6	8%
	Appropriateness	12	16%
	Effectiveness	10	13%
	Efficiency	9	12%
	Safety	7	9%
	Competence	4	5%
	Continuity	2	3%
TOTAL		76	





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