



ANNUAL IMPACT REPORT FOR HEALTH INNOVATION 2018-19

albertainnovates.ca





ACKNOWLEDGEMENTS

This report is a summary of the outcomes and impacts achieved in 2018/19 resulting from research and innovation investments by Alberta Innovates' Health Innovation portfolio. The information is collected annually for the purposes of accountability and learning.

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

ISBN: 978-1-894927-93-2 (Print)

ISBN: 978-1-894927-94-9 (Online)

Table of Contents

- EXECUTIVE SUMMARY** 3
- INTRODUCTION** 5
- MEASURING ACHIEVEMENTS** 6
- HEALTH INNOVATION STRATEGIES** 8
 - Strategic Investments 8
 - Provincial Platforms 8
 - Collaborations and Partnerships 9
- SUPPORTING RESEARCH AND INNOVATION PROJECTS** 10
 - Building Research and Innovation Capacity 10
 - Highly Skilled Personnel (HSP) 10
 - Further Funding 11
 - Awards and Recognition 12
 - Research Tools and Methods 12
 - Research Databases and Models 13
 - Software and Technical Products 14
 - Expanding Teams Through Collaboration 15
 - In-Kind Contributions through the Use of Facilities 18
 - Industry Engagement 18
 - Sharing Evidence 19
 - Influence on Policy and Practice 22
 - Artistic and Creative Products 23
 - Publications 24
 - Health and Wellness Impacts 26
 - Contributing to Social and Economic Prosperity 29
 - Intellectual Property and Licensing 29
 - Health Innovation’s Partnerships and Collaborations 29
 - Provincial Platforms 30
 - Alberta SPOR SUPPORT Unit (AbSPORU) 30
 - Health Research Ethics Board of Alberta (HREBA) 31
 - A pRoject Ethics Community Consensus Initiative (ARECCI) 31
 - Alberta Clinical Research Consortium (ACRC) 32
 - Alberta Data Institute 33
- SUMMARY** 34
- REFERENCES** 36
- APPENDIX A: DATA SOURCES AND TIMEFRAMES** 37
- APPENDIX B: STRATEGIC INVESTMENTS** 38

Impact Briefs

| | |
|--|----|
| Influencing Policy for Treatment of Stroke Patients Internationally | 25 |
| Providing Simple Tools for Patients and Physicians to Monitor Their Health | 27 |
| Enhancing Clinical Decision Support for Prevention of Contrast-Induced Acute Kidney Injury in Cardiac Catheterization | 28 |

Report Tables

| | |
|---|----|
| Table 1: Top Sources of Additional Funding | 12 |
|---|----|

Report Figures

| | |
|--|----|
| Figure 1: Impact Pathways for Health Innovation | 7 |
| Figure 2: Building Human Research Capacity | 10 |
| Figure 3: Growing AI's Investments | 11 |
| Figure 4: Types of Research Material Created | 13 |
| Figure 5: Types of Research Databases and Models Developed | 13 |
| Figure 6: Software and Technical Products | 14 |
| Figure 7: Timing of Collaborations and Partnerships Relative to Grant or Award Start Year | 15 |
| Figure 8: Collaborators and Partners Around the World | 16 |
| Figure 9: Collaborators and Partners in Canada | 17 |
| Figure 10: Purpose of Engagement Activities with Industry Partners and End-Users | 19 |
| Figure 11: Types of Engagement Activities | 20 |
| Figure 12: Geographic Reach of Engagement Activities | 20 |
| Figure 13: Primary Audiences for Engagement Activities | 21 |
| Figure 14: Primary Outcomes of Engagement Activities | 21 |
| Figure 15: Types of Influences on Policy, Practice, Patients and the Public | 22 |
| Figure 16: Outcomes of Influences on Policy, Practice, Patients and the Public | 23 |
| Figure 17: Type of Creative Product | 24 |
| Figure 18: Health Outcomes Achieved by Researchers | 26 |
| Figure 19: Medical Products, Interventions and Clinical Trials | 26 |
| Figure 20: Intellectual Property and Licensing | 29 |

EXECUTIVE SUMMARY

Alberta Innovates (AI) is committed to evolving Alberta's research and innovation system to be more responsive to the needs of Albertans and more focused on impacts. This includes supporting research and innovation activities that focus on the priorities of Albertans, as well as working with our partners to cultivate a more seamless innovation system with a clear path from discovery to impact.



AI has a long history of collaborating with other funders to advance impact assessment in the health sector. This includes serving as a leader in the development and use of shared impact assessment tools and frameworks. Each year since 2014/15, AI has published an annual impact report to:

- Demonstrate to Albertans how investments in research and innovation are contributing to their health and wellbeing, as well as to economic diversification in the province;
- Share the impact-related evidence that helps inform our decision-making with the broader innovation ecosystem; and
- Assist the research community in responding to the need to more fully and accurately report on the achievements they make through publicly funded research activities.

The 2018/19 Impact Report highlights the multitude of ways in which AI is making a difference for Albertans through our strategic investments in health. It is important to remember, though, that the report reflects only a portion of the value delivered to Albertans since it does not capture the full spectrum of AI' investments in the health sector and beyond.

HEALTH RESEARCH AND INNOVATION (R&I) IMPACT HIGHLIGHTS (2018-19)



Catalyzing Health R&I

FROM DISCOVERY TO IMPACT*

\$50.5 MILLION
in Annual Investments



282

Active R&I Project and People Investments

**This scorecard reflects self-reported impact data submitted by 56% of active award holders*

Building Research Capacity



1,124

Highly Skilled People Supported



169

New Research Tools/Methods Developed



215

Awards Received



\$121.5M

Leveraged Funding

Translating Evidence Through Collaborations & Partnerships



591

Partnerships



128

Facility In-Kind Contributions



938

Engagement Activities



57

Teams Engaging with Industry

Accelerating Innovation



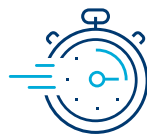
768

Publications



30

Artistic & Creative Products Developed



8%

Improvement in Clinical Research Administration Efficiency



308

Opportunities to Influence Policy & Practice

Health and Economic Impact



70

Results Across The Quality of Care Dimensions



19

New Medical Products/ Interventions Developed



10

Intellectual Property Applications Protected

INTRODUCTION

Alberta Innovates (AI) invests in Research and Innovation (R&I) to improve the health and well-being of Albertans and create social and economic benefits. AI's key health sector investments include:

- 1) Supporting R&I projects that improve health outcomes through the development of new treatments, technologies, and models of care;
- 2) Accelerating the translation of new discoveries into care by partnering with key entities in the innovation field, from medical device makers to small and medium-sized enterprises (SMEs);
- 3) Linking health systems with SMEs to facilitate the co-design of solutions that address real-world health problems;
- 4) Supporting the development of highly skilled people through training and early career development programming; and
- 5) Coordinating and integrating Alberta's R&I system through the establishment of provincial platforms and collaborative partnerships that:
 - a) Increase the prevalence and quality of patient-oriented research;
 - b) Facilitate high quality, integrated and efficient clinical research;
 - c) Provide a streamlined, effective, collaborative and integrated model for ethics review of human health research; and
 - d) Put secondary health and health-related data to work.

The support that AI provides through its Health Innovation portfolio (herein referred to as "Health Innovation") enhances the science knowledge base in Alberta. More specifically, AI's investments are used to train, attract and maintain leading researchers and innovators in Alberta, and advance high-quality R&I projects that address the needs of the population. This report provides an overview of the achievements made through the support and services of AI Health Innovation in 2018/19.

MEASURING ACHIEVEMENTS

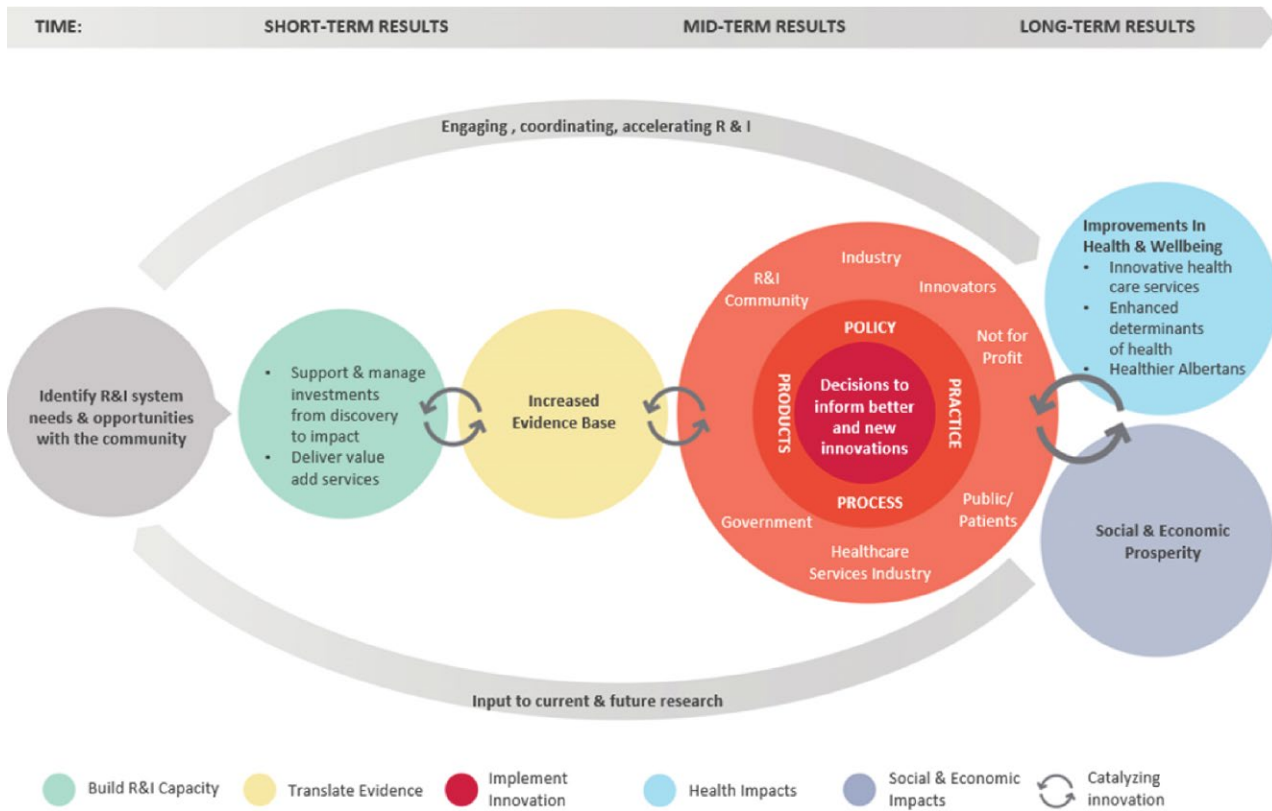
The outcomes and impacts of AI's support and activities are not always immediately apparent. This is because a sufficient period of time is required between when research is initiated, when new knowledge is generated, and when specific applications (e.g., new products, policies, or practices) are developed. Additional time lags are often experienced before widescale adoption/diffusion is achieved.



Given these time lags, impact pathways represent an effective way to illustrate the people, processes, and tools through which research and innovation are translated into outcomes and impacts. By monitoring progress along these pathways, AI and its stakeholders are better able to trace incremental progress and deliver the right supports and services at the right time to optimize the R&I ecosystem.

The figure on the next page illustrates the impact pathways of Health Innovation. It highlights the importance of building R&I capacity in Alberta to increase the health-related knowledge and evidence base. More importantly, it shows that innovation is necessary to move advancements in knowledge into real-world changes that improve our health, well-being and economic and social prosperity.

FIGURE 1
Impact Pathways for Health Innovation



AI uses a series of indicators to monitor the progress being achieved through its investments in projects (i.e., awards and grants provided to researchers) and people (i.e., studentships and fellowships awarded to trainees). An online reporting system, ResearchFish®, is used to ensure routine and systematic data collection on these indicators across a large portion of AI’s health-related grant investments. This data is self-reported by award holders. A total of 282 grant recipients completed a ResearchFish® report.

Data on the progress being achieved by other initiatives in Health Innovation, such as provincial platforms, partnerships and collaborations is collected from the leads of those initiatives as well as through administrative systems.

HEALTH INNOVATION STRATEGIES

Health Innovation's mission is to catalyze the development, growth and sustainability of an impact-focused health innovation ecosystem and economy in Alberta. In 2018/19, Health Innovation used three strategies for achieving impact. These include strategic investments, partnerships and collaborations, and provincial platforms.

Strategic Investments

A key mechanism through which Health Innovation helps highly skilled people engage in collaborative, multidisciplinary research and innovation activities is our strategic investments. In 2018/19, these investments generated benefits such as:

- Communication tools to help people understand the H. pylori bacteria and how to avoid infection;
- Legislation governing severity-based triage for stroke patients in other parts of North America;
- A phone app that enables patients to monitor their health and securely share their information with their physician;
- An electronic clinical decision support system to prevent acute kidney injury (AKI) among people undergoing certain heart procedures and potentially saving millions of dollars required to care for patients with AKI.

Provincial Platforms

Health Innovation also invests in several provincial platforms to assist researchers and innovators in overcoming barriers and challenges in advancing R&I, towards the goal of increasing the success of research and accelerating the application of new knowledge.

Key focus areas for the provincial platforms in 2018/19 were: integrating and making health data available for secondary use (e.g., research); creating research and care that puts the 'patient-first'; and streamlining processes for ethics review and clinical research. These platforms and the diverse connections that underpin them optimize the ability of our health R&I ecosystem to identify and respond to Alberta's health needs.



Collaborations and Partnerships

AI works through partnerships and collaborations to accelerate the process of putting health solutions into practice, and in turn, serve the needs of Albertans. This includes brokering linkages that bring different organizations and people together to jointly overcome barriers within the life sciences innovation system. In addition to pooling expertise and leveraging resources, these linkages also stimulate the exploration of cross-sector opportunities to expand and optimize the use of research findings and achieve health, social and economic impacts. These partnerships and collaborations also assist AI in attracting additional investments to Alberta to support innovation, foster new technologies and solutions, and contribute to the creation of a thriving health sector.

To translate research into solutions, AI collaborates with partners in the health system, publicly funded post-secondary institutions, small and medium-sized enterprises (SMEs), multinational enterprises (MNEs), government and others. These collaborations and partnerships also assist in targeting solutions to meet the identified needs of the health system and help foster an environment for innovation that will make a difference in the lives of Albertans.ⁱ

ⁱ Note that this report does not include all of Alberta Innovates' industry partnerships and collaborations. Within Health Innovation, some recently implemented industry partnerships and collaborations were excluded as it is too early to report on their progress, outcomes and impacts.

SUPPORTING RESEARCH AND INNOVATION PROJECTS

In 2018/19, the progress and achievements of 255 award recipients was reported for 282 awards monitored through ResearchFishⁱⁱ and those results are summarized in aggregate herein: 72 research teams and investigators reported on 90 awards, and 183 trainees reported on 191 awards. This report also includes insight into other investments made by Health Innovation during that time and monitored using other mechanisms.

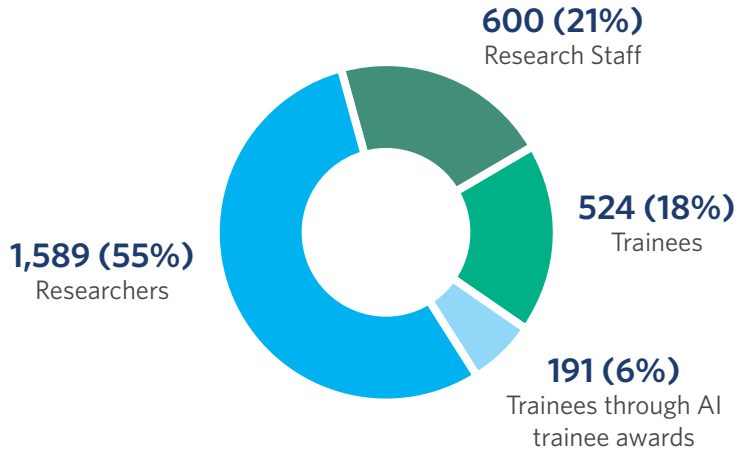
Building Research and Innovation Capacity

AI invests in building and sustaining provincial research capacity by providing grants to researchers to employ and train staff in the research process as well as grants directly to trainees to enable them to develop skills and knowledge. Research funding agencies worldwide recognize that investing in capacity building is a cost-effective way to advance healthcare, improve problem-solving, and reduce the gap between evidence and practice. By investing in trainees today, we are building stronger researchers and knowledge users for the future economy.

Highly Skilled Personnel (HSP)

Seventy-four research teams reported that they were directly supporting the research activities of 600 highly skilled persons, including research staff, project management and knowledge translation professionals. In addition, 69 of these teams indirectly supported 524 post-doctoral fellows and graduate trainees, undergraduate/summer school and health professional degree students by providing mentoring, training and research experience.

FIGURE 2
Building Human Research Capacity



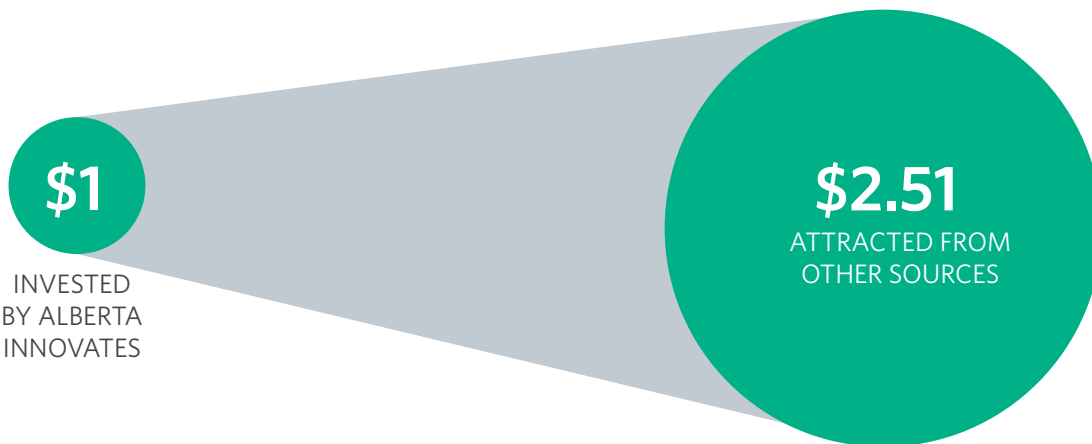
ⁱⁱ This represents 56% of the grants and awards managed by Health Innovation in 2018/19. Those excluded from reporting in ResearchFish[®] included some legacy grants and awards (e.g., Independent Investigator awards), as well as funding programs that include travel and conference grants.

Further Funding

The high calibre of researchers and trainees supported by AI is broadly recognized. This is exemplified by the additional investments they attract. In 2018/19, AI researchers and trainees attracted almost \$122 million in additional funding as follow-on grant and award applications with other funding agencies. In addition to this supplemental funding, many investigators received financial contributions from collaborators/partners.ⁱⁱⁱ This amounted to \$977,208 in 2018/19.

Considering the two sources of additional funding – grant funding and contributions from partners/ collaborators – this equates to a total of \$122,494,367. The additional funds attracted by AI researchers and trainees translates to approximately an additional \$2.51 in financial support for every \$1 invested in them through AI (Figure 3).

FIGURE 3
Growing AI's Investments



The Canadian Institutes of Health Research (CIHR), which provided \$46 million through 53 individual grants and awards, was the largest single contributor of additional funding to AI researchers (Table 1). A total of 132 (85%) grants received as further funding were from funding agencies in Canada.

ⁱⁱⁱ Approximately 10% of collaborations/partnerships reported included direct financial contributions from partners. However, this proportion and the value of direct contributions is likely underreported as contractual confidentiality agreements limit reporting and was available for only 3% of the applicable collaborations/partnerships.

TABLE 1
Top Sources of Additional Funding

| Organization | Number of Grants | Total Amount |
|--|------------------|----------------------|
| Canadian Institutes of Health Research | 53 | \$45,999,390 |
| Government of Alberta | 5 | \$12,345,251 |
| Genome Canada | 1 | \$12,000,000 |
| National Football League Scientific Advisory Board | 1 | \$11,976,667 |
| CFI | 1 | \$4,668,405 |
| Health Protection Agency | 1 | \$4,668,405 |
| Ministry of Economic Development, Trade and Tourism | 3 | \$4,624,560 |
| Western Economic Diversification Canada | 1 | \$4,080,000 |
| Canadian Donation and Transplantation Research Program (CDTRP) | 1 | \$3,300,000 |
| National Health and Medical Research Council | 1 | \$2,963,429 |
| Other | 179 | \$14,891,052 |
| Total | 247 | \$121,517,159 |

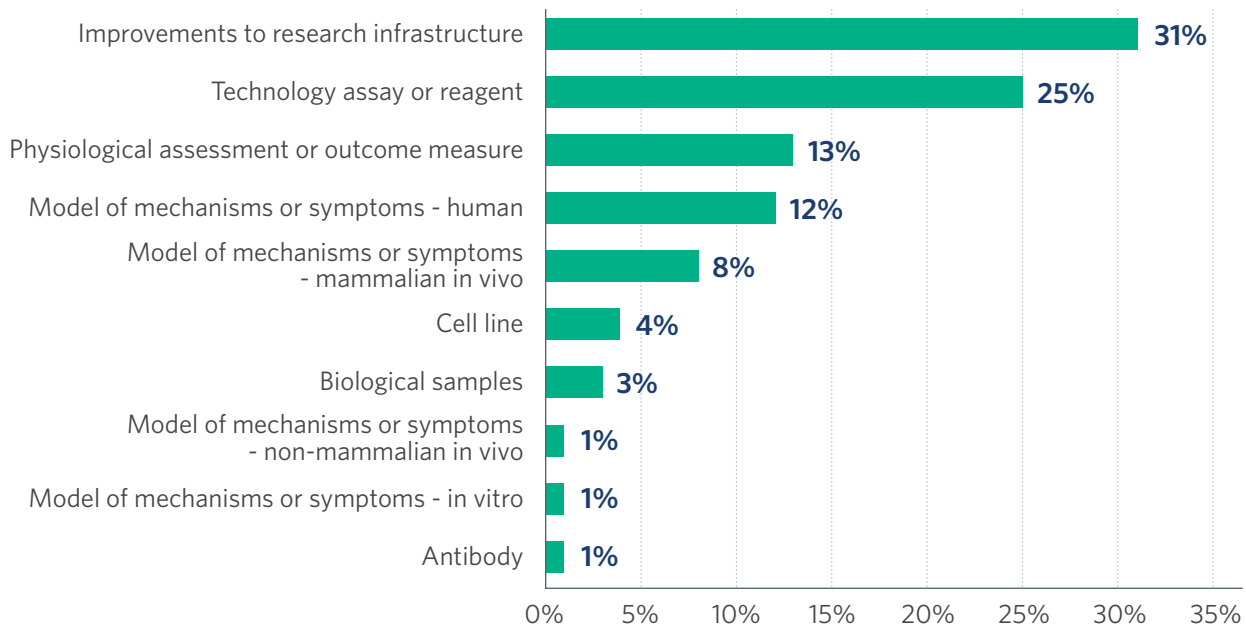
Awards and Recognition

Awards and recognition are concrete evidence that the research team has built capacity and other people recognize it. AI-funded investigators collectively received 215 awards and recognitions in 2018/19. Seventy-five percent of these involved receiving research prizes, poster or abstract prizes, or a personal invitation to be a keynote speaker, reflecting opportunities in which investigators could also share and advance the research supported by AI. Recognition of AI's investigators extended well beyond Alberta's borders with 25% and 29% of awards and recognitions being at the national or international level, respectively.

Research Tools and Methods

Novel materials are sometimes created as a necessary component of a research project to make new lines of enquiry possible. The researchers supported by Health Innovation generated 169 research tools and methods in 2018/19. Almost half of the research materials were models of mechanisms or symptoms, and technology assays or reagents (Figure 4). Thirty-seven percent of the research materials had been shared with others and this sharing most often occurred in the calendar year three-years following the grant or award start year.

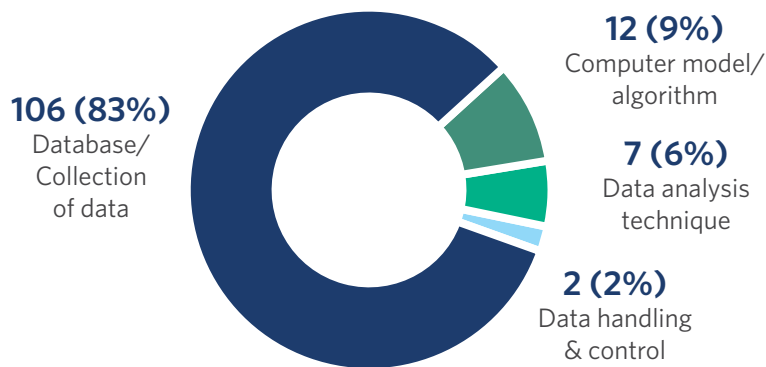
FIGURE 4
Types of Research Material Created



Research Databases and Models

Researchers often develop new databases, datasets, or models during research that can make a significant difference to their research or that of others. AI funded investigators and trainees reported 11 new outputs for an accumulated count of 127 such developments by 2018/19 and these predominantly consisted of databases (Figure 5). The reach of AI's investments was further enhanced albeit indirectly through the sharing of 24% of the reported databases, datasets or models with other research groups.

FIGURE 5
Types of Research Databases and Models Developed

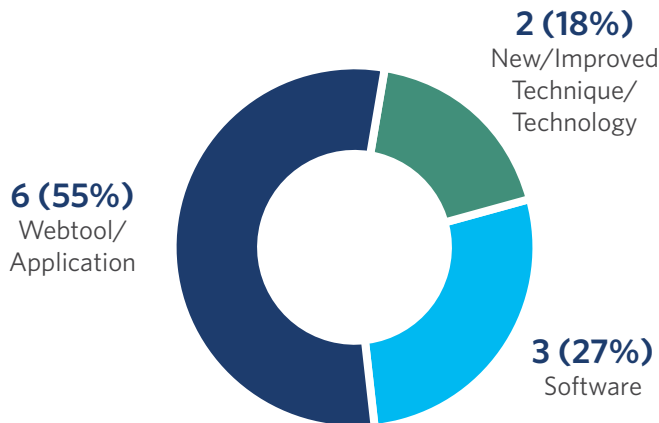




Software and Technical Products

The development of software and technical products represents another way in which research is advanced and or translated into new products or services. In 2018/19, eleven software and technical products were developed through eight grants (Figure 6). More than half (55%) of these products were made available online as a webtool.

FIGURE 6
Software and Technical Products



Expanding Teams Through Collaboration

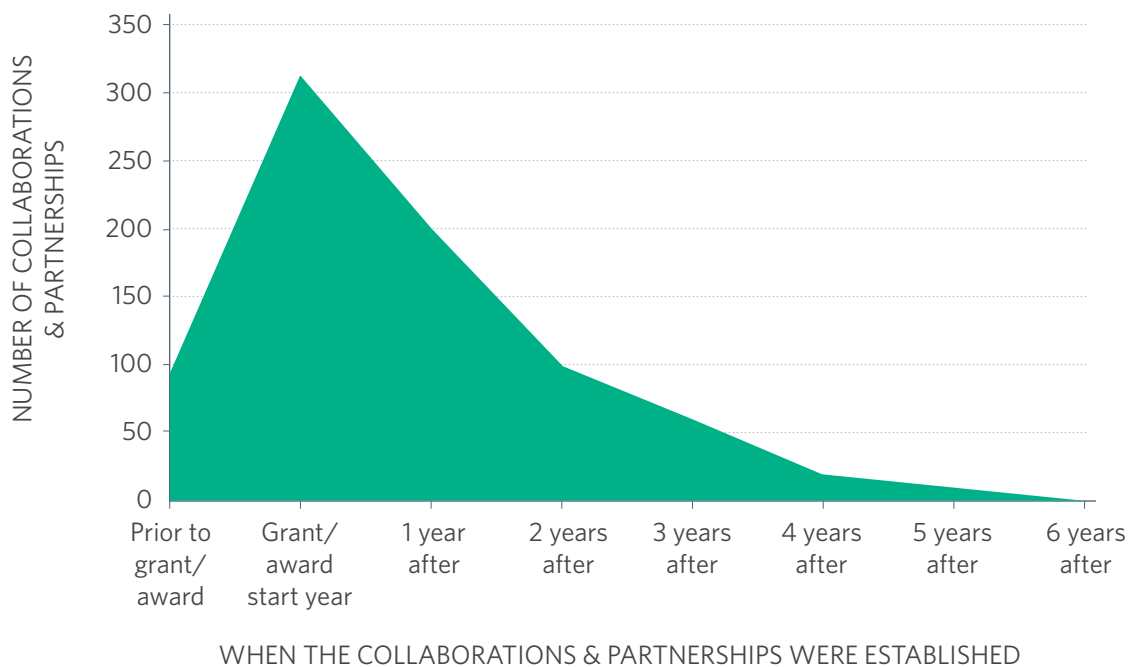
Researchers typically work with a variety of partners and collaborators in different sectors and seldom rely on a single source of funding to advance their research. Collaborations often enable research to proceed through in-kind supports or provide a different perspective that ensures the research is robust and has broad reaching impact.

Collaborations and partnerships often involve multiple organizations. AI funded researchers reported 591 current collaborations in 2018/19. Most collaborations and partnerships were established with researchers in the academic or university sector (34%) and with publicly funded groups (29%), while hospitals and not-for-profit organizations accounted for 27% combined.

Most collaborations and partnerships were formed either the year that the grant was awarded, or the following year (64%), and researchers continue to establish collaborations and partnerships for the duration of the research project.

Twelve percent of the collaborations and partnerships were formed before the start of AI's support, indicating that these long-lasting collaborations support a body of research larger than that for which the grant was awarded.

FIGURE 7
Timing of Collaborations and Partnerships Relative to Grant or Award Start Year



Globally, AI researchers and trainees established research collaborations in 25 countries (Figure 8). By and large, the AI researcher and trainee collaborators and partners were located in Canada (80%), and more specifically Alberta (56% overall and 78% of those located in Canada) (Figure 10).

FIGURE 8
Collaborators and Partners Around the World

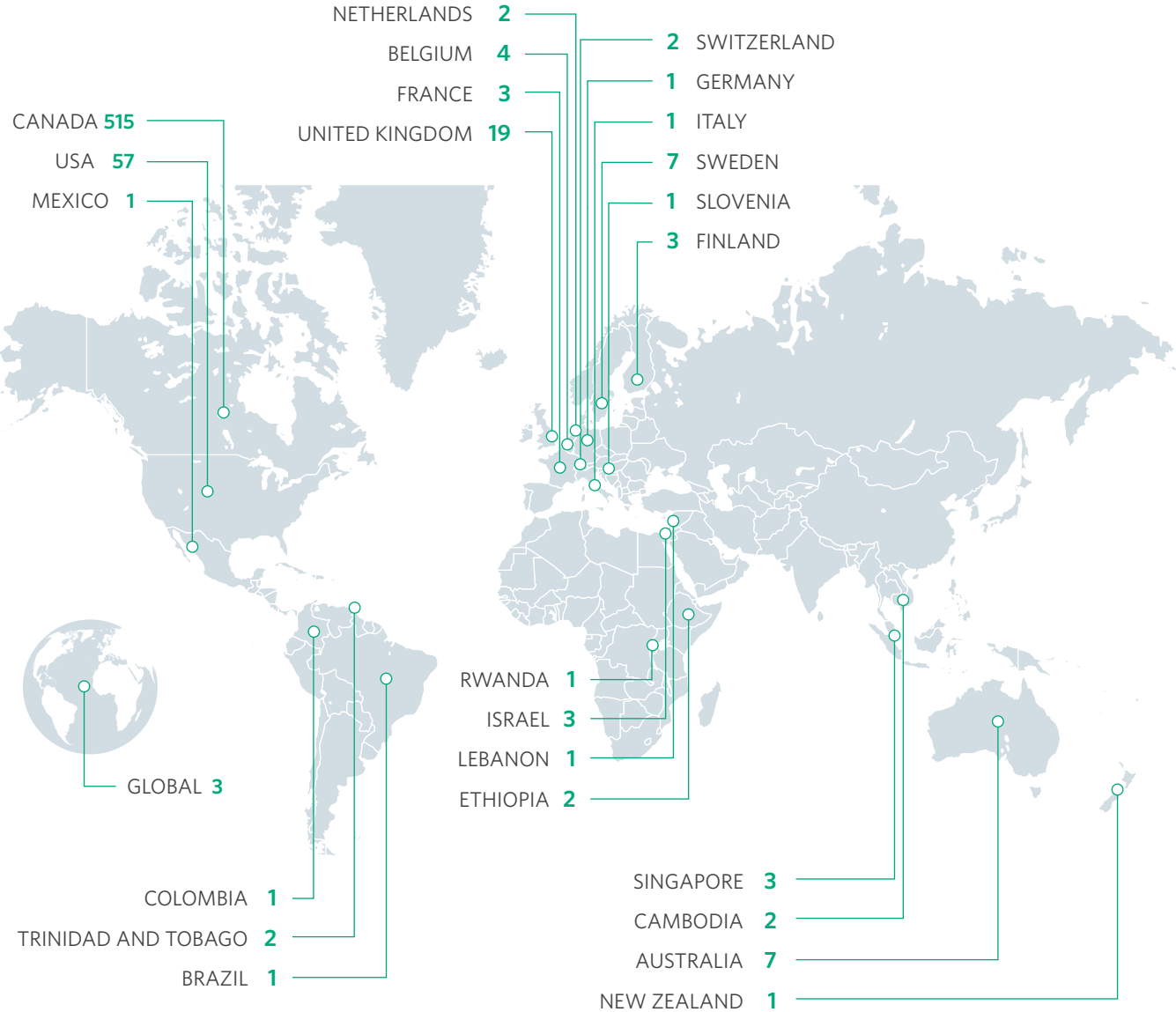
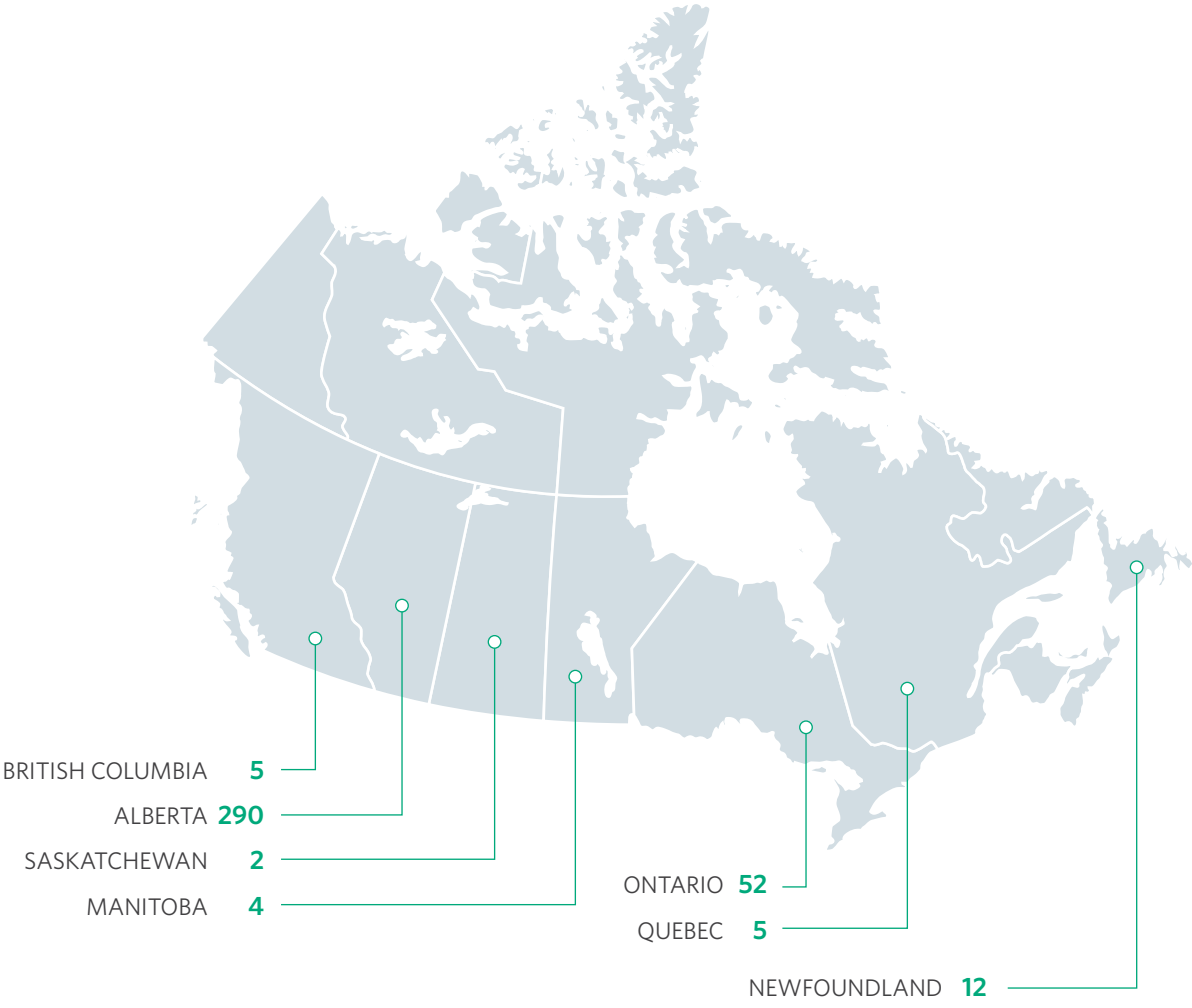


FIGURE 9
Collaborators and Partners in Canada



In-Kind Contributions Through the Use of Facilities

Use of facilities is a form of collaboration where researchers negotiate the use of infrastructure, facilities or equipment to complete the research without needing to build or procure their own. Forty researchers negotiated the use of 128 facilities or services to support their research.

Examples of this type of in-kind support include:

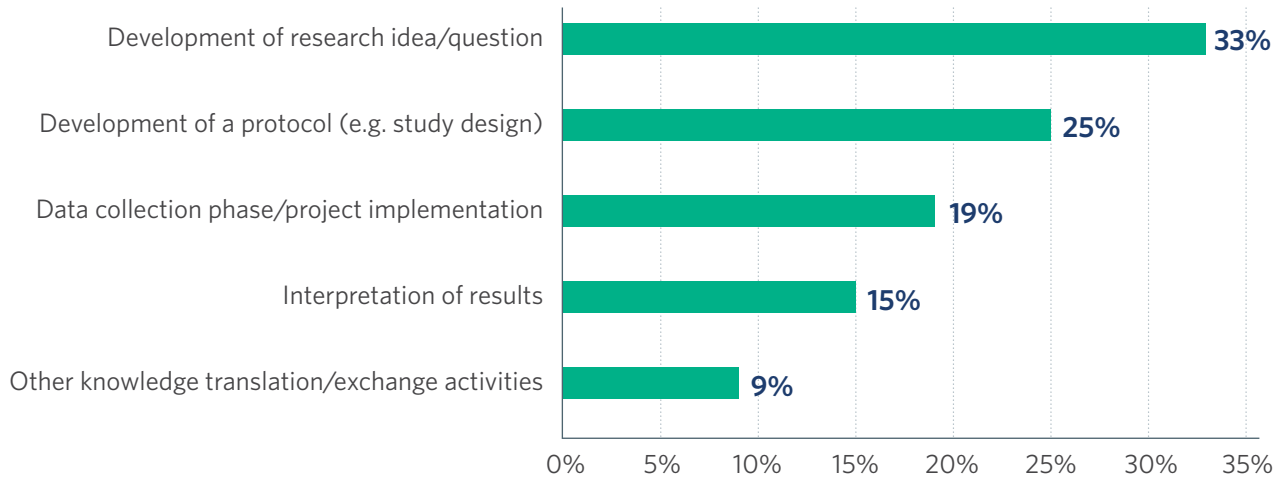
- The Calgary Research Unit hosts a copy of the SAPCReN-CPCSSN dataset within their high security server
- The Canadian BioSample Repository supports clinical trials in sample processing and storage
- The Alberta Cancer Biobank and BC Cancer Biobank provide breast cancer samples for genomes sequencing projects
- The Canadian Donation and Transplantation Research Program (CDTRP) supports various areas of pre-clinical and clinical research, including regulatory, patient engagement and access to central resources, and training
- CellCAN provides access to their resources for regenerative and cellular therapy
- The SPOR network provides support in patient engagement
- The Metabolomics Innovation Centre provides analytical chemistry infrastructure including NMR, GC-MS and LC-MS Bioinformatic Resources
- Resistance DB (Compute Canada/Westgrid) provides high performance computing required to develop large-scale database development that links the genomic, proteomic, and metabolomic profiles of clinically relevant pathogens to patient outcomes
- The Tomorrow Project provides access to lifestyle and disease information and biological samples; the collection includes 55,000 Albertan participants followed up for more than 15 years

Industry Engagement

Most investigators reported engagement with industry partners at some point during the life of their research project. The purposes of engagement with industry are shown in Figure 10. The most commonly reported purpose for Industry engagement was for development of research ideas/questions.

FIGURE 10

Purpose of Engagement Activities with Industry Partners and End-Users



Sharing Evidence

Researchers contribute to science, knowledge, and better understanding of human health when their findings and insights are shared with others. This sharing demonstrates progress along the pathways to impact but does not in itself constitute an outcome or impact. Rather, outcomes begin to occur after knowledge moves beyond the researchers in a way that guides the decisions and actions of innovators (e.g., policy and decision makers, practitioners, industry, service providers, other researchers, patients, and the public). The mechanisms researchers use to share the research findings are engagement activities (Figure 11), developing tools that make the information easier to understand and share, and publishing their findings so the information can be shared internationally.

Relevant and appropriate engagement activities – the means through which researchers meaningfully involve a broad range of stakeholders in the research activities¹ – are another important way of progressing research along the impact pathway. These activities can occur at any time throughout the research process depending on the purpose of engagement (e.g., to assist with the design of the research, to communicate findings, or to gather feedback on findings). Overall, 938 engagement activities were completed in 2018/19. These activities, which were predominantly in the form of talks or presentations, were mainly conducted locally or regionally and were primarily provided to professional practitioners (Figures 12 and 13). The most frequent known outcome of engagement activities was an increase in requests for participation (Figure 14).

FIGURE 11
Types of Engagement Activities

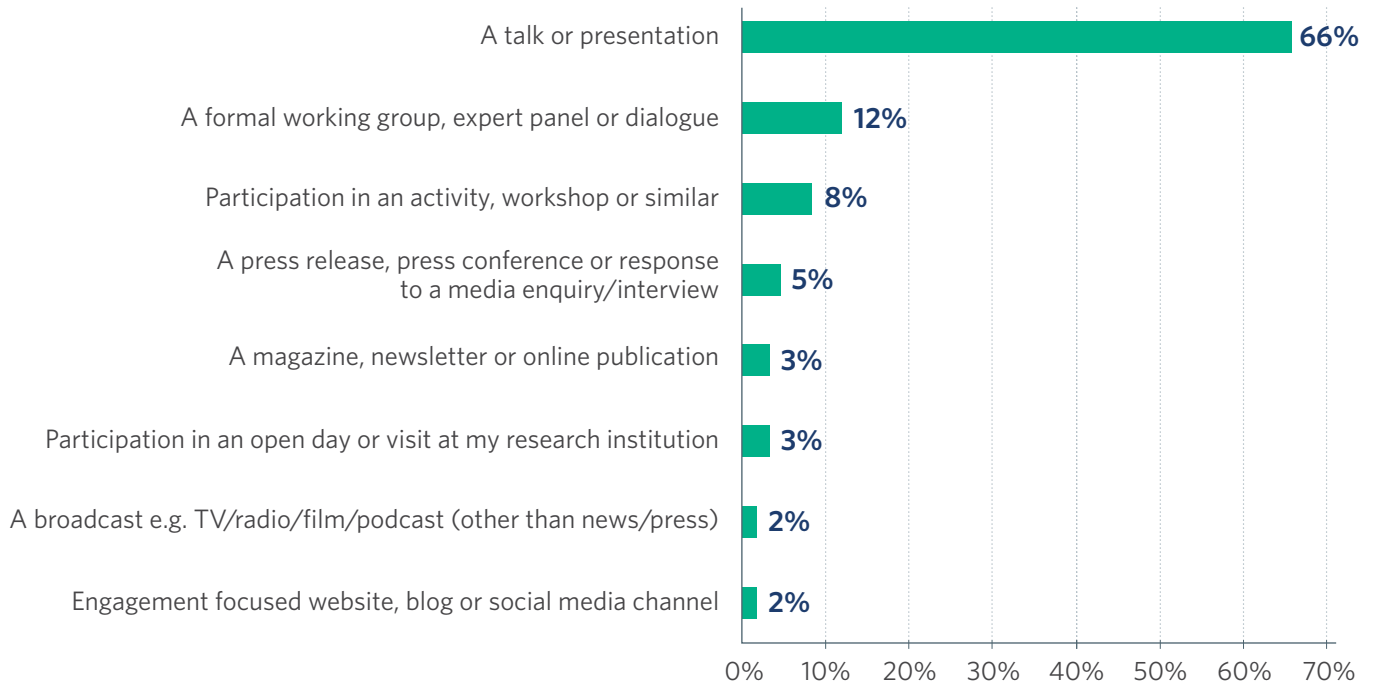


FIGURE 12
Geographic Reach of Engagement Activities

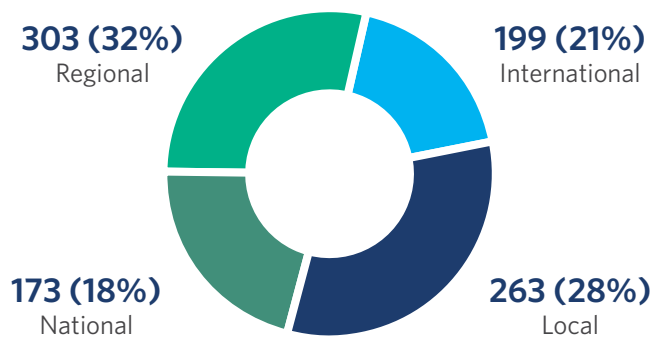


FIGURE 13
Primary Audiences for Engagement Activities

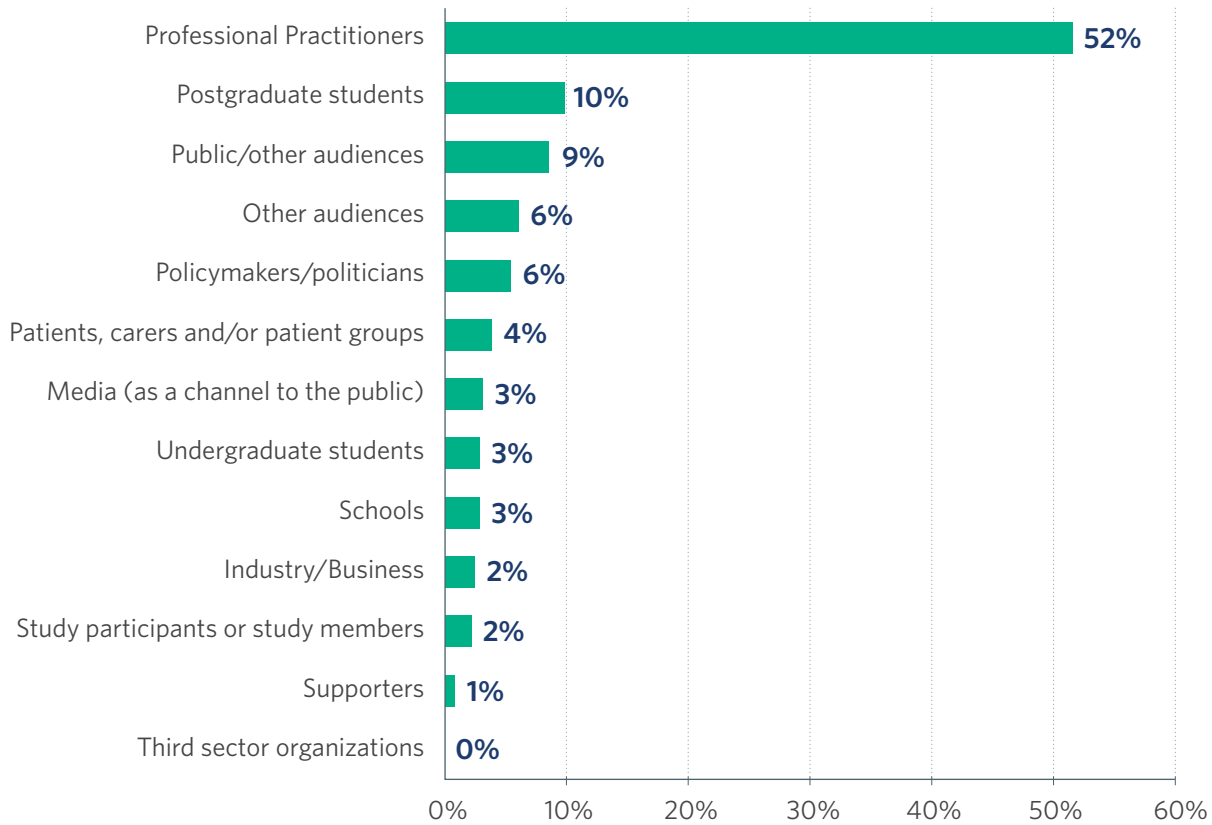
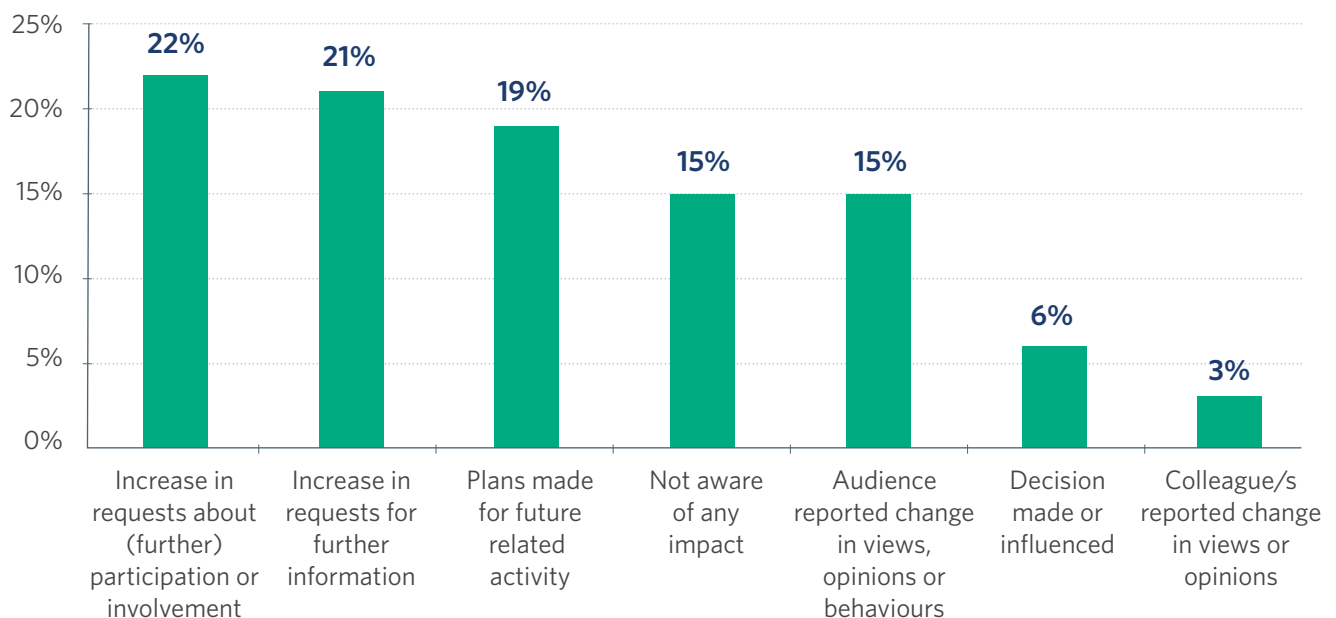


FIGURE 14
Primary Outcomes of Engagement Activities



Influence on Policy and Practice

In the context of health, the intended purpose of enabling decisions is for health-related knowledge to be adopted and used by organizations or individuals to affect or create health or health-related impacts. To do so, knowledge must first be translated into various innovations that include new or revised policies, practices, products, or processes (including services). These in turn serve as the pathways to achieving improvements in health and well-being.

In 2018/19, fifty-seven (63%) grant and award holders reported having 308 opportunities to influence policy, practice, patients, and the public. Participation in a guideline or advisory committee (50%) accounted for the most common method of influencing policy or practice (Figure 15). The most frequently reported known outcome of the influences on policy and practice were improved educational and skill level of workforce (21%). Other notable influences in health outcomes included improvements in survival, morbidity, or quality of life (9%), improved accessibility of public services (8%), effective solutions to societal problems (7%), and improved regulatory environment (6%) (Figure 16).

FIGURE 15
Types of Influences on Policy, Practice, Patients and the Public

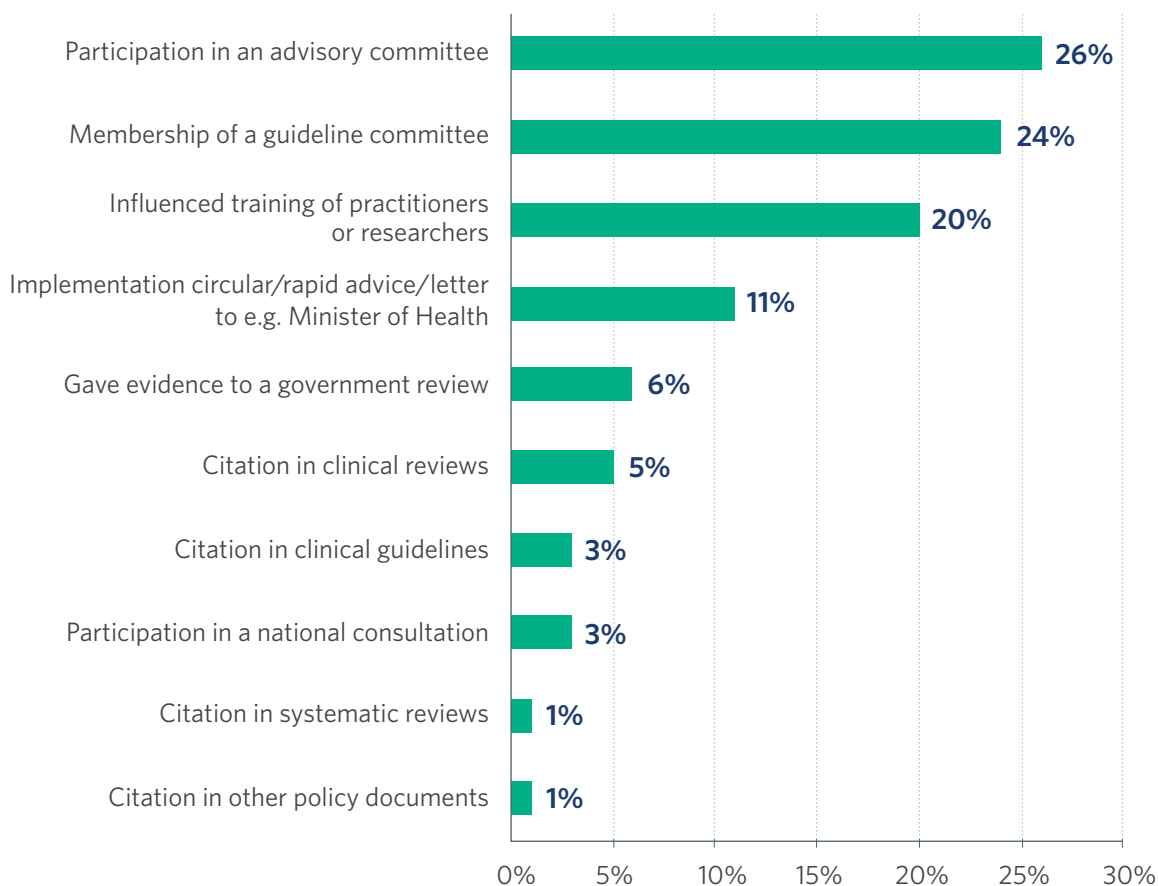
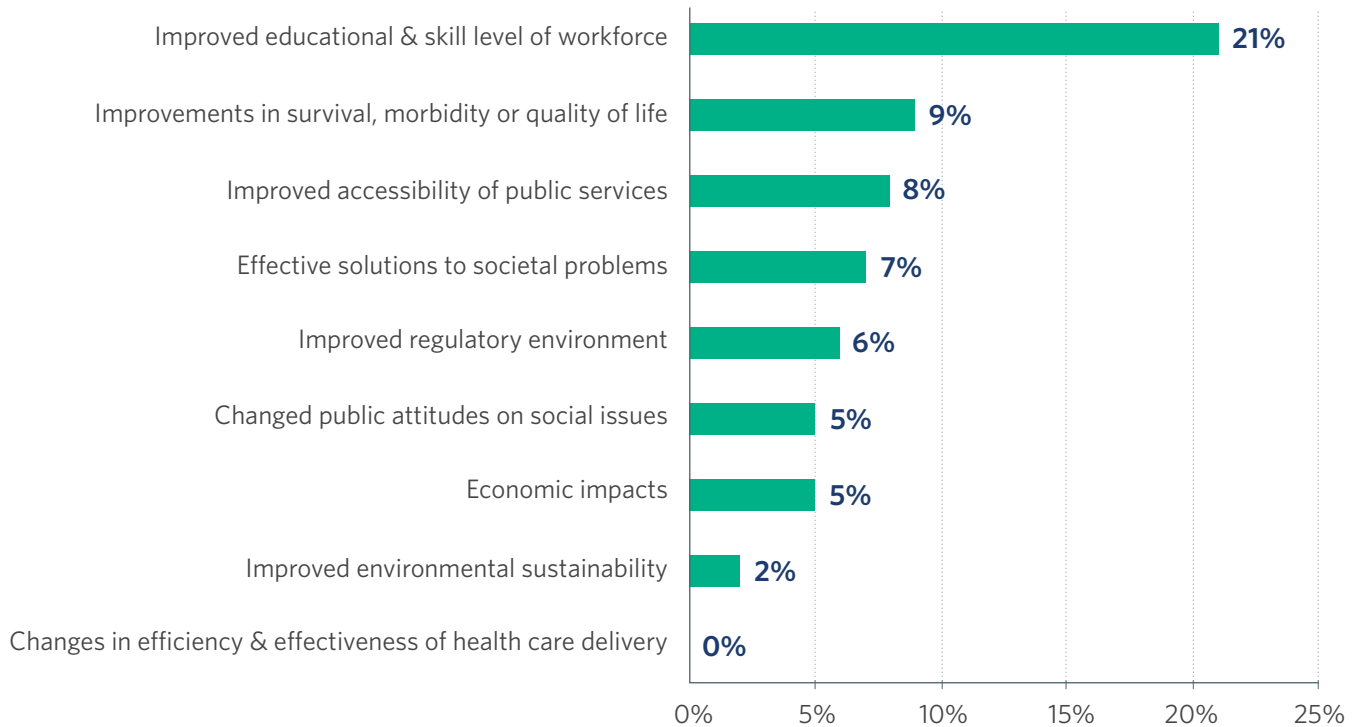


FIGURE 16

Outcomes of Influences on Policy, Practice, Patients and the Public



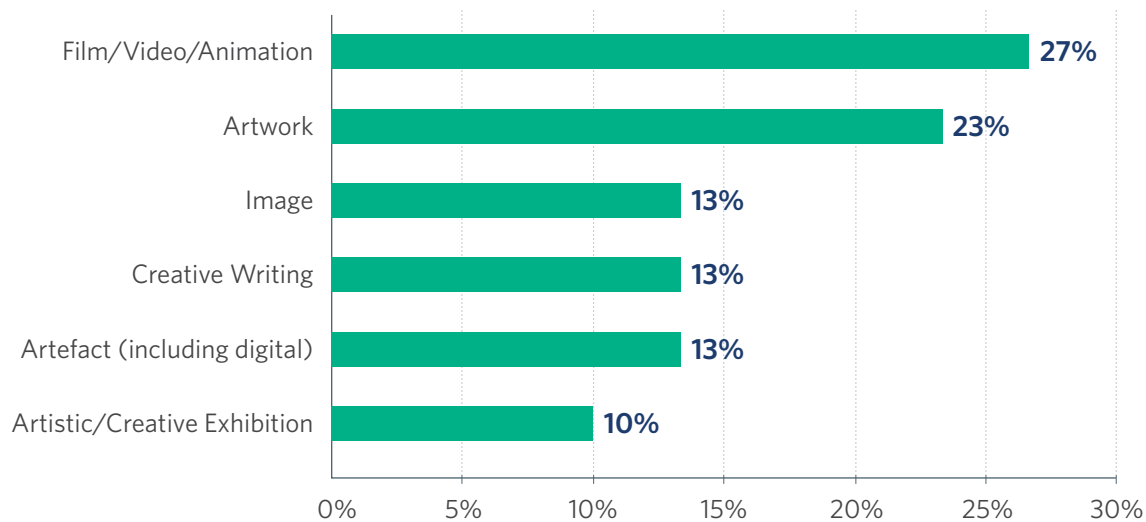
Artistic and Creative Products

Artistic and creative products have been used effectively by researchers and trainees to share knowledge and make it more accessible to targeted stakeholder groups such as patients, the public, and practitioners. In 2018/19, six artistic and creative products were developed by AI grant recipients. Overall, an accumulation of 30 products have been created by AI researchers including:

- In 2018, The ENRICH Research Team and the Community of Maskwacis put together a report highlighting the innovative research that has taken place over the past 6 years (and beyond). The Elders Advisory Committee – who has been a key part of shaping ENRICH research – provided input on the content within the report. This report is written at a lay-language level and is meant to be a way of disseminating information to health care providers, chiefs in council, and to the general population within the community of Maskwacis.
- Community members were invited to submit logo entries with the requirement that they include a visual representation of the H. pylori bacterium. The drawings capture the imagination and innovation of community members. They illustrate community perspectives on a health risk of community concern and on research aimed at promoting health and well-being. While one logo was selected and is used for each project, the contests have allowed [the research team] to accumulate a collection of community art.

- Animated educational video describing the skin graft procedure. Following consultation with patients and clinicians it was felt that a simple animation, designed specifically for pediatric burn patients, would serve as a valuable tool to inform children and their families of about the split thickness skin grafting procedure.
- A series of comics that depict scenarios with health care aides and residents from the START study. The intent of these comics is to facilitate knowledge transfer.
- A storyboard infographic was created to educate patients on (1) when you need a CT scan and when you don't, (2) the risks of CT imaging, and (3) the four Choosing Wisely questions to ask your doctor. The infographic is currently being displayed in Alberta's 17 busiest emergency departments.
- Podcasts have been created by trainees to provide easy access to common topics in Multiple Sclerosis:
 1. Multiple Sclerosis pathophysiology
 2. Oligodendrocytes and myelin in health and disease
 3. Multiple Sclerosis animal models

FIGURE 17
Type of Creative Product



Publications

Publications are more than a public record of research – they are a key engagement strategy that enable researchers to communicate and share information with their peers to advance science and knowledge. Successful publication also draws attention to the investigators, their institutions and their funding sources and therefore is commonly taken into consideration for funding decisions and academic recognition or promotion. Investigators contributed 768 publications to the scientific literature and 708 (92%) of these were journal articles.

IMPACT BRIEF

INFLUENCING POLICY FOR TREATMENT OF STROKE PATIENTS INTERNATIONALLY

Stroke can have lasting impact and may leave an individual with major disabilities. Fast and effective treatment is essential for disability-free survival; timely access to a hospital that can provide the correct treatment is critical to mitigate potential impact.



Jessalyn K Holodinsky

Graduate Student, University of Calgary

Jessalyn Holodinsky was awarded \$32,000 to study patient access to stroke treatments in Alberta under the supervision of Dr. Michael Hill.

The standard of care for acute ischemic stroke treatment has been intravenous thrombolysis (clot-dissolving medication); however more recently it has been found that endovascular therapy (neurological surgery) is a superior treatment option. In Alberta, thrombolysis is offered at 12 primary stroke centres (PSC) across the province. However, due to the specialized facilities needed for endovascular therapy, this procedure is only offered at two comprehensive stroke centres (CSC), one in Calgary and one in Edmonton. Patients must therefore be transported to the nearest PSG for thrombolysis, taken to the nearest major hospital for endovascular therapy, or a combination of both.

Holodinsky's research developed models that recommended the best transportation options given distance and treatment options.

Using evidence produced by her research, the Society for Neurointerventional Surgery in the US was able to influence legislation in Arizona, Tennessee, and Rhode Island to implement severity based triage for stroke patients, meaning that more severe stroke patients could be allowed to bypass closer hospitals in the pursuit of more advanced care at specialist centres. Additional work is ongoing to change legislation in Massachusetts.

Health and Wellness Impacts

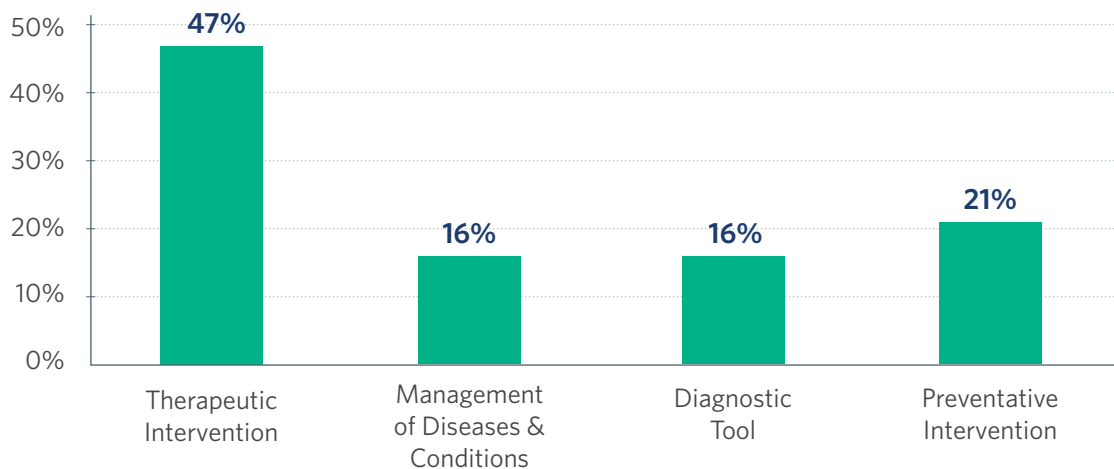
It is often cited that it takes an average of 17 years to translate research discoveries from the lab to the marketplace, or from the bench to the bedside.^{2,3} However, early evidence of contributions to health and health-related impacts within the period of funding are often available and currently serve as leading indicators of translational potential. A small number of AI-funded researchers are able identify impacts of their work during the grant period. Twenty-four (10%) researchers identified 87 outcomes from their research in relation to health status, the determinants of health and or quality of care (Figure 18).

FIGURE 18
Health Outcomes Achieved by Researchers



In addition to improved health outcomes, 19 new medical products, interventions and clinical trials were reported by AI funded researchers. Forty-seven percent of these were therapeutic interventions (Figure 19) including drugs, cellular and gene therapy, medical devices, and radiotherapy.

FIGURE 19
Medical Products, Interventions and Clinical Trials



IMPACT BRIEF

PROVIDING SIMPLE TOOLS FOR PATIENTS AND PHYSICIANS TO MONITOR THEIR HEALTH

Diabetes affects 20% of seniors. Hypertension affects 82% of seniors with diabetes and is the primary cause of diabetes-related complications and death. Home blood pressure telemonitoring (sharing the results via the cloud with the patient's physician) enables more effective treatment and blood pressure control.

Dr. Raj Padwal

Faculty of Medicine & Dentistry, University of Alberta

Dr. Raj Padwal has pioneered a telemedicine tool that enables patients to self-monitor their blood pressure and share those results with their physician in real time. Measuring blood pressure in a clinic can result in inaccurate readings in up to 40% of patients. Home measurement and monitoring of blood pressure is considered the most accurate and reliable, yet the process for measuring blood pressure and sharing the results with a physician was relatively manual and ineffective. That is, until Dr. Padwal developed a simple smart phone app called Sphygmo™ that measures both blood pressure and blood glucose more accurately than other similar tools on the market and shares the information with the individual's health care provider.

Dr. Padwal was awarded \$187,500 as a Partnership-Operating Grant co-funded by the Canadian Institute for Health Research (CIHR) through the e-Health Innovations Partnership Program. The project, Telemonitoring and Protocolized Case Management for Hypertensive Community Dwelling Seniors with Diabetes or TECHNOMED developed and validated a cloud-based platform that can auto-interpret results, automatically average multiple readings for more accurate assessment, and created a full-service telemonitoring platform. The consumer/patient app (Sphygmo Home) is now available on the iOS and Google Play app store.

Dr. Padwal's TECHNOMED project has had a number of impacts on the health of Albertans and the health care system, including improving diagnosis, reinforcing existing standards of care, becoming the new standard of care, improving delivery of and timely access to clinical service, reduced burden on limited resources.



IMPACT BRIEF

ENHANCING CLINICAL DECISION SUPPORT FOR PREVENTION OF CONTRAST-INDUCED ACUTE KIDNEY INJURY IN CARDIAC CATHETERIZATION

X-ray contrast dyes are used to see and follow blockages in arteries during heart procedures such as angioplasty. Most people recover following these life-saving procedures, but the contrast dyes pose a risk for a small portion of people and causes contrast-induced acute kidney injury (CI-AKI) to approximately 1,300 Albertans each year.

Dr. Matthew James

Cumming School of Medicine, University of Calgary and Libin Cardiovascular Institute

and

Dr. Michelle Graham

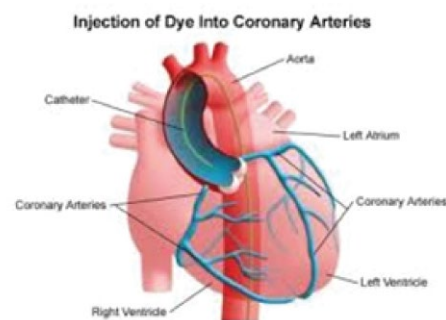
University of Alberta and Mazankowski Alberta Heart Institute

Drs. Matthew James and Michelle Graham were awarded \$748,633 to implement an electronic clinical decision support system to prevent acute kidney injury (AKI) among people undergoing certain heart procedures. The tool assists cardiac physicians with automated identification of patients at increased risk for Contrast-induced-AKI and provides point-of-care information on safe contrast and fluid volume targets. Their research has validated that the decision support tool accurately identifies patients who are at risk and provides appropriate customized care recommendations for these patients.

This project is a continuation of previous work that identified the link between dye-based cardiac catheterization and AKI and identified characteristics of patients that increase their risk of injury.

It has been estimated that reducing the relative risk of CI-AKI by 20% would immediately reduce annual direct health care costs in Alberta by approximately \$1.8 million dollars. It is estimated that CI-AKI leads to an additional 2.5 bed-days in hospital, more depending on severity, and an incremental cost of \$5,530 per episode of care for those developing CI-AKI. With an estimated 1,344 CI-AKI

cases after cardiac catheterization per year, the costs of CI-AKI could exceed \$7 million annually in Alberta. These cost estimates do not include downstream increases in health care costs, including the incremental increases in costs that may range from \$1,890 to \$21,000 following hospitalization due to management of the resulting long-term kidney disease, or the costs of providing chronic dialysis following a severe CI-AKI event (up to \$80,000 annually).



Source: Charlotte Sun Herald

Risk of CI-AKI is now calculated and communicated to the cardiologist for over 90% of eligible patients undergoing cardiac catheterization procedures; the CI-AKI Risk Prediction Model has been adopted by all interventional cardiologists in Alberta performing catheterization laboratory procedures. Preliminary results indicate a reduction in contrast volume use, and an increase in use of IV fluid recommendations resulting in a reduction in the AKI incidence. Patients also report high satisfaction with follow up care and reduced anxiety.

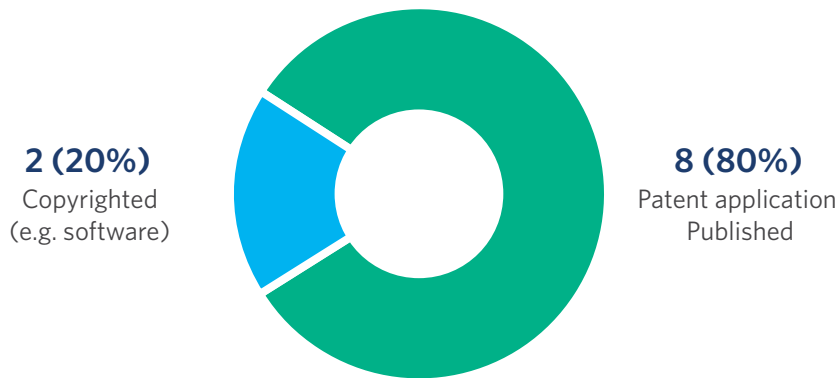
Contributing to Social and Economic Prosperity

Commercialization activities reflect more immediate and measurable market acceptance of the products of academic R&I. It also provides an early indication of the work being done by researchers and innovators that may potentially contribute to economic and societal impact.

Intellectual Property and Licensing

Eight (3%) grant recipients reported 10 instances of intellectual property and licensing in 2018/19. Most of these consisted of published patent applications (Figure 20).

FIGURE 20
Intellectual Property and Licensing



Health Innovation's Partnerships and Collaborations

AI recognizes innovation as a key driver to reverse the trend of rising healthcare costs in Alberta. The aim is to improve patient outcomes through the facilitation of state-of-the-art healthcare innovation. Alberta companies, with the support of AI, have an opportunity to play a role in shaping how the health industry evolves. To this end, AI invests in several innovation initiatives to establish or enhance the required activities and capabilities for innovation success as built through partnerships and collaborations. By collaborating with partners in the health system, post-secondary institutions, small and medium sized enterprises (SMEs), multinational enterprises (MNEs), government and others, AI helps translate research into solutions. It assists in targeting those solutions to meet the identified needs of the health system and creating an environment for innovation that will make a difference in the lives of Albertans. It is by driving research into innovation that these differences in the form of health, economic and social impacts will be accelerated and increased.

Provincial Platforms

In addition to funding research, AI invests in provincial platforms – clusters of services and capacity building initiatives that are designed to address barriers and inefficiencies in Alberta’s R&I environment.

Alberta SPOR SUPPORT Unit (AbSPORU)

Patient-oriented research in Alberta and the Northwest Territories is being accelerated and its quality and quantity improved through the efforts of the Alberta SPOR SUPPORT Unit (AbSPORU)^{iv}. Launched in 2014/15 as a five-year \$48 million federal-provincial partnership between AI and CIHR, this platform connects researchers and trainees with a network of training, expert advice, and research services with a patient perspective. This support platform enables new discoveries to happen faster because investigators have more timely access to data, expertise, and services. It also helps ensure that researchers incorporate patient priorities in their projects.

AbSPORU’s research service platforms served 406 clients in 2018/19. The AbSPORU Data Platform facilitates access to 56 administrative health databases and provides data linkage and analytic services for health research. In 2018/19, the Data Platform completed most of its 182 data access requests^v in less than six weeks, and some in under 3 days, helping to sustain the number and quality of patient-oriented research projects carried out in Alberta using administrative data holdings, and contributing to the accelerated pace of research as part of Alberta’s interconnected suite of health research service platforms. Moreover, AbSPORU is one of the collaborating sites in the SPOR Canadian Data Platform which received \$39 million in funding from the Canadian Institutes of Health Research (CIHR) in 2019 to facilitate multi-jurisdictional research: funding that will be used to hire two-three highly trained personnel in Alberta dedicated to delivering advanced analytic services to the research community. Additionally, the Data Platform is participating in the development of the Canadian Institutes of Health Information’s (CIHI) hosted portal for multi-jurisdictional research requests based on the AbSPORU model, and has provided information on available Alberta datasets and case definitions for 30 common conditions to the national inventory being created by the Pan-Canadian Real World Health Data Network: national initiatives that are benefiting from the participation of AbSPORU and its provincial assets and expertise in research data access and analytic services.

^{iv} Information about AbSPORU is available at <https://albertainnovates.ca/programs/strategy-for-patient-oriented-research/>

^v Requests for research support submitted through the AbSPORU central Intake Portal

Health Research Ethics Board of Alberta (HREBA)

AI provides secretariat support to the Health Research Ethics Board of Alberta (HREBA), a research ethics board (REB) governed by Health Canada and the US Food and Drug Administration. The Board provides ethical reviews and ongoing ethical oversight of cancer and community-based research involving humans, personal information, and biological samples. HREBA is composed of a cross-disciplinary team including doctors, members of the scientific community, non-scientific members with specific expertise, including ethicists, lawyers, privacy experts and community members from across the province. The board's role is to safeguard the rights and welfare of individuals who volunteer to participate in research by ensuring ethical principles have been considered and applied prior to the research being initiated.

Key achievements for 2018/19 include:

- Approval of 451 new research ethics applications and 3,905 post-approval activities;
- Steady decrease in average days to approval. In 2018, the time from submission of an ethics application to approval was 63 days (down from 84 days in 2016) and the time with the REB was 42 days. This means that research studies in Alberta can get started faster.

A pRoject Ethics Community Consensus Initiative (ARECCI)

Established in 2008, **A pRoject Ethics Community Consensus Initiative (ARECCI)** is an AI platform that 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.^{vi} At the heart of ARECCI is the recognition that not all projects requiring ethics review need to be reviewed by a REB despite having 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. By diverting non-research projects from REBs, ARECCI is helping to reduce the use of REBs' resources in screening out and redirecting ethics applications for these projects while facilitating shorter project start times.

The ARECCI program continues to fill the gap of helping individuals, groups and organizations minimize the ethical risks in projects. In using the two decision support tools, "ARECCI Ethics Guideline Tool" and "ARECCI Ethics Screening Tool", individuals can identify the ethical risks, determine the category of risk, and determine the appropriate ethics mitigation and or consultation. Individuals have requested more of a health focus tool and thus, in working with several other provinces, the ARECCI tool will be re-tooled.

A parallel project under-development is looking at the Ethics of Innovation, including data ethics, artificial intelligence, and machine learning. The goal of this project is to assist individuals, groups, organizations, and companies in identifying and minimizing the ethics risks in developing or adopting innovation.

^{vi} Information about ARECCI is available at: <https://albertainnovates.ca/programs/arecci/>

Alberta Clinical Research Consortium (ACRC)

Clinical health research (CHR) exists to improve quality of life. The Alberta Clinical Research Consortium (ACRC) was first established in 2011 when leaders from the research community agreed that collaborative efforts to streamline research processes would improve the climate for CHR across Alberta. The vision of the ACRC is high quality, efficient, integrated CHR in the province.

One of the key strategies of the ACRC is a focus on enhancing CHR efficiency and effectiveness. Working with representatives from Alberta Health Services, AI, the Alberta SPOR SUPPORT Unit, the Alberta College of Physicians and Surgeons, Covenant Health, Government of Alberta - Ministry of Economic, Development, Trade and Tourism, University of Alberta and University of Calgary, members of the ACRC collaborate to develop support tools and resources for clinical research in Alberta.

The ACRC's strategies and initiatives have been informed through stakeholder engagement. In 2013, the ACRC commissioned a baseline (Time 1, T1) survey of Alberta's CHR community to understand their experience and satisfaction with the CHR environment. The survey was repeated in 2018/19 (Time 2, T2) to monitor changes in the community's experience after a 5-year roll-out of various ACRC initiatives including the introduction of the [Alberta Clinical Research Roadmap](#) (an interactive online navigator outlining the steps to setting up and conducting a CHR study within Alberta), Glossary (curated definitions for clinical research terminology), FAQs (providing answers to frequently asked questions about clinical research), the implementation of the EDGE research management system, and introduction of an annual Alberta Clinical Health Research Conference.

Results from the 2018/19 survey revealed several positive trends with regards to the community's CHR experiences' and environment. For example, there was an increase in awareness of the ACRC (up 11%) and the platform initiatives available to support the community. Additionally, satisfaction with the CHR environment in Alberta increased by 9%, with most (86%) planning to remain in Alberta to continue their research. Some key indicators used to monitor the CHR environment also improved. The estimate of time required to complete all CHR administrative tasks was shorter at T2 (277 days) compared to T1 (281 days), indicating improvements to CHR efficiency and effectiveness. The community also reported improvements in their CHR capacity in terms of their i) ability to administer studies (an increase of 14% from T1) and ii) having sufficient opportunities for professional development (an increase of 10%). Overall, the survey results demonstrate that awareness of the ACRC increased and satisfaction with the CHR environment in Alberta improved in part as a result of the contributions and the collaborative efforts of the ACRC members and organizations engaged in the consortia.

Time 2 Results at a Glance

Difference in results from T1:

↑ 11% increase in ACRC awareness

↑ 9% increase in satisfaction with CHR in Alberta

↓ Time spent on CHR administration, down 8%

↓ 4 day drop in estimates of the time to complete CHR administration tasks

Alberta Data Institute

The Alberta Data Institute (ADI), launched in 2018, facilitates innovation in the province by providing Alberta researchers and entrepreneurs with technical services and access to datasets required for the development of industry-led, advanced applications that require large amounts of data, including artificial intelligence. ADI clients will benefit from the opportunity to prototype data-driven ideas, de-risk early-stage innovation and increase their data maturity and capabilities.

Data-driven innovations will emerge in all sectors to support initiatives in food safety, smart agriculture, environmental monitoring, pipeline management, healthier Albertans and more. The ADI is undertaking a targeted pilot project with our partners to demonstrate how artificial intelligence can help achieve improved health care objectives.

The goals of the ADI are to provide positive impact by:

- Facilitating the enhanced and advanced use of health, environmental, social data and other digital information for the benefit of Albertans; and
- Leveraging data and analytics to build capacity that creates and advances knowledge to foster innovation and promote Alberta's economic and social growth.

The Institute will accomplish these goals through:

- **Sector engagement:** Innovative opportunities to access and analyze meaningful data with the purpose of addressing industry challenges will be identified through consultation and fostering ongoing relationships. Therefore, sector experts will engage with the ADI to identify the right datasets to collect and curate, and potential data refinement processes needed, to make the raw data better suited for specific analyses.
- **Raw data extraction:** Partnerships, data governance, and a trust-based approach is crucial to how the ADI can engage with data owners and be able to access their raw data.
- **Data refinement:** The ADI technical platform will allow users to refine data using data science tools. This refinement will maintain data richness while ensuring it can be easily ingested for further analysis and, at the same time, respect data privacy. The ADI will facilitate access to these refined datasets not only in direct response to an identified sector opportunity, but also through the ADI's data portal where unexpected additional insights may be found.
- **Storage, sharing and discovery:** The ADI will house and curate the refined datasets in the ADI's data portal. In its portal, datasets will be catalogued and curated. Linkages and insights identified between datasets will be maintained and exposed to other users to build from, extracting further value from the data.

The ADI is in the unique position to build trust and establish lasting partnerships that can be reinforced, and it will create tangible value by facilitating well-managed data- and insight-sharing amongst data providers and users.

SUMMARY

AI aims to be recognized nationally and internationally as a go-to organization for supporting and influencing the development of cutting-edge innovations and practices. Through supporting R&I, we hope to improve patient outcomes by facilitating state-of-the-art healthcare processes and systems, which currently makes up nearly half of the provincial government budget. Increased innovation is one of the paths for driving economic diversification and job growth while bending the cost curve.

This report demonstrates the progress that AI is making in growing the health sector in Alberta and building a seamless innovation system from discovery to impact. It also describes numerous strategies that AI is delivering through partnerships and collaborations to ensure that Alberta's researchers and innovators are overcoming challenges and having a clearer path for innovation, one that concurrently provides patients with the best care for the best value.

These advancements 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 human capacity and infrastructure, and the leveraging of expertise and resources that Alberta will be best able to address the health needs of Albertans, both now and in the future.

The new vision for AI investments in the Health sector includes a focus on:

- Project investments that are designed to rapidly launch partnerships or to prototype the potential for a program.
- Program investments that aim to scale and spread support in areas of strategic interest.
- Platform investments that intend to enable and accelerate health R&I.
- People investments that are designed to develop competencies in key health innovation areas in alignment with our strategic interests.

The Health business line delivers a robust R&I portfolio that engages clients throughout their journey and provides supports across the innovation spectrum - from push to pull and including bridging. Target clients include innovative researchers, health professionals, entrepreneurs in the health space, AB-based SMEs, large MNE health industry players, and the Government of Alberta at large. In partnership with the broader ecosystem, our team delivers valuable funding and services to support our clients in achieving economic and health outcomes for the province of Alberta.

The Health business line will continue to implement a shift towards supporting a digital future by:

1. Deploying additional resources and retooling existing mechanisms to support ecosystem enablement projects. This includes:
 - a. the development of Business to Business (B2B) partnerships that can support digital innovation,
 - b. a renewed focus on value-extraction from significant investments (e.g., primary care, computational biology and bioinformatics, 'omics', in silico modelling), and
 - c. implementing mechanisms for talent development that can support and will be supported by the digital future (e.g., analytics, augmented reality training for professionals).
2. Focusing on data as an enabler by:
 - a. launching /operating the Alberta Data Institute, a community platform that will provide the framework needed for the "open data" concept to become a reality in Alberta, and
 - b. using data to identify opportunities and develop solutions (artificial intelligence and machine learning tools).
3. Supporting digital technology development and implementation by:
 - a. designing new and retooling existing programs that will support entrepreneurial activity in the digital health space, and
 - b. developing digital solutions that will enable our clients to better interact with our team.
4. Innovating with regards to healthcare production and distribution by:
 - a. partnering with health systems to enable innovation testing and adoption (e.g., technology, health delivery models), and
 - b. launching and engaging in initiatives that will empower patients, providers, and communities to better achieve health outcomes.
5. Identifying and supporting emerging health industries such as:
 - a. alternative medical products (e.g., cannabinoids),
 - b. virtual healthcare management,
 - c. precision-health.

In fiscal 2019, the Health Innovation portfolio will be developing new frameworks, operating models, architectures, and roadmaps to implement actions directed toward the strategic priorities. The Health Innovation portfolio will look at opportunities that increasing focus on community and social factors, rather than medical or acute care. This aligns to consumer and digital trends that have already impacted other sectors. Emerging opportunities will include development of machine learning models to predict clinical outcomes, virtual models to guide patients in self-management and the prevention of disease through healthier lifestyles, and improving upon platform technologies, secondary use data and programs for digital health.

REFERENCES

- 1 American Institutes for Research. (2012). Innovative methods in stakeholder engagement: An environmental scan (AHRQ Publication No. 12-EHC097-EF). Rockville, MD: Agency for Healthcare Research and Quality. effectivehealthcare.ahrq.gov/topics/stakeholders-engagement-others/research-2012-1
- 2 Balas E, & Boren S. (2000). Managing clinical knowledge for health care improvement. In: JH van Bommel & AT McCray (Eds.) Yearbook for medical informatics. (pp. 65-70). Stuttgart, Germany: Schattauer Verlagsgesellschaft mbH.
- 3 Grant J, Cottrell R, Cluzeau F, Fawcett G. (2000). Evaluating “payback” on biomedical research from papers cited in clinical guidelines: applied bibliometric study. *BMJ*, 320:1107-11. bmj.com/content/320/7242/1107

APPENDIX A: DATA SOURCES AND TIMEFRAMES

Alberta Innovates' Annual Impact Report for Health Innovation: 2018/19 reflects information from multiple data sources. The primary source for impact-related data for our strategic investments is an electronic impact data collection system (ResearchFish®). The information in this system includes numerous grants and awards, including those to trainees. As the grant and award process is dynamic, the grants and awards programs included in the Annual Impact Report may vary from year to year (e.g., new programs may be implemented by AI and others may be sunset) as may the specific projects funded within each program.

Due to the structure of data within ResearchFish®, data reported for grants and awards includes achievements realized between January 1, 2018 and March 31, 2019 (e.g., 15-month period) as opposed to the fiscal year of April 1, 2018 to March 31, 2019. 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](#).

Information related to the progress to and achievement of outcomes and impacts for investments such as provincial platforms, and partnerships and collaborations were gathered from the lead representative(s) for the initiative. These results 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, 2018 and March 31, 2019. 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, 2019.

APPENDIX B: STRATEGIC INVESTMENTS

| Funding Opportunity | Description | Number of Active Grants/Awards 2018-19 | Total Investments in 2018-19 |
|--|---|--|------------------------------|
| Accelerating Innovation into CarE (AICE) | <p>Provides funding support to generate real-world evidence in a clinical setting for new technologies developed by SME innovators that have the potential to address priority needs of Alberta’s health system. The funding enables the health system to test and validate the impacts of new technologies, particularly on disease pathways or workflow, with the intent of informing adoption and improving the health system and overall health of Albertans.</p> <p><i>50% total project costs up to \$150,000 per project; maximum of 18 months</i></p> | 5 | (\$49,835.00) |
| Alberta/Eli Lilly Translational Research Fund Opportunity | <p>Collaboration between Eli Lilly, Alberta Innovates and Alberta Health to support targeted translational research and innovation projects that will impact the health of Albertans. \$1.5M total Fund.</p> | 2 | \$89,950.00 |
| Alberta/Novartis Translational Research Fund Opportunity | <p>A partnership with Novartis Pharmaceuticals Canada Inc., this fund supports translational research and innovation projects with a strong potential to advance Multiple Sclerosis (MS) patient care and/or research over the short or medium term (three to five years). The Opportunity will support the development of research and innovation projects in the priority topic areas identified by Novartis and the province of Alberta: development and implementation of evidence-based care; delivery of patient care; advancement of MS research and innovation; and patient engagement.</p> <p><i>Up to a maximum of \$100,000 per year for up to 3 years</i></p> | 4 | \$10,109.53 |
| Alberta/ NovoNordisk Infrastructure Development Grant | <p>The Novo Nordisk and Alberta Innovates collaboration supports development of database infrastructure that will integrate patient reported outcomes into a surveillance system with the objective of strengthening and improving health and health care delivery for diabetic patients.</p> | 1 | \$417,773 |

| Funding Opportunity | Description | Number of Active Grants/ Awards 2018-19 | Total Investments in 2018-19 |
|---|---|--|---------------------------------|
| Alberta/Pfizer Translational Research Fund Opportunity | <p>We partner with Pfizer Canada Inc., Western Economic Diversification (WD) Canada, and Alberta's Innovation and Advanced Education ministry to support research and innovations in shared priority areas that show promise of commercial development into new products and services for improving health and addressing needs in the health system.</p> <p><i>Up to \$200,000 for up to a maximum of 18 months.</i></p> | 2 | \$398,300 |
| Alberta/ Sanofi Health Innovation Fund | <p>The Alberta/Sanofi Health Innovation Fund supports health research capacity development in the area of drug development, the refinement of health policy, the identification of health outcomes and overall health research community collaborations.</p> | 1 | \$0 |
| APHI Development Grant | <p>A partnership with Genome Alberta to facilitate the coalescence of multi-sectoral teams, catalyze their activities in precision health and enhance Alberta's competitiveness in upcoming national and international precision health funding opportunities.</p> <p><i>No set maximum amount. Anticipated range is \$100K - \$300K. Duration is 18 months.</i></p> | 4 | \$0 |
| Canadian Institutes of Health Research eHealth Innovation Partnership Program (CIHR eHIPP) | <p>eHealth Innovation Partnership Program (eHIPP), is a collaborative funding program designed to create a new generation of cost-effective patient- and population-centered health care solutions by supporting partnerships between Canadian technology companies and 'innovation communities' to co-develop and integrate innovative e-health solutions that deliver real-world health care value.</p> <p><i>Total Project values up to \$375,000 per year for four years from all partners (\$46,875 per year from AI)</i></p> | 1 | \$46,875 |
| CIHR Partnership - Chronic Disease | <p>A funding opportunity to translate existing and new knowledge generated by basic biomedical, clinical, and population health research into testing of innovations that can improve clinical science and practice and foster policy changes, leading to transformative and measurable improvements in patient health outcomes, and in efficiency and effectiveness of healthcare delivery within five years.</p> <p><i>Alberta Innovates matched funding of \$4.89 million for a period of support from January 1, 2016 to December 31, 2020.</i></p> | 3 | \$0 |

APPENDIX B: STRATEGIC INVESTMENTS

| Funding Opportunity | Description | Number of Active Grants/ Awards 2018-19 | Total Investments in 2018-19 |
|--|---|--|---------------------------------|
| CIHR Partnership - iCT (CIHR SPOR Innovative Clinical Trial Multi Year Grant) | <p>Program supports for innovative clinical trials using designs that are alternative to traditional Randomized Controlled Trials with application in areas ranging from product development to health system improvement.</p> <p><i>Operating grants of up to \$1.5 million each over four years are available from CIHR through the Strategy for Patient-Oriented Research (SPOR) to build capacity in innovative clinical trials. Alberta Innovates will consider providing matching funds to Alberta-based applicants that are successful in this CIHR competition.</i></p> | 2 | \$281,539 |
| CIHR Partnership - SPOR Networks | <p>The pan-Canadian SPOR Network in Primary and Integrated Health Care Innovations is a key CIHR initiative under the Strategy for Patient-Oriented Research that builds on regional and national assets in community-based health care foster alliances between research, policy and practice.</p> | 1 | \$0 |
| CLPNA - Partnership | <p>The College of Licensed Practical Nurses of Alberta (CLPNA) and Alberta Innovates (AI) have collaborated to develop the Advancing Knowledge in Practical Nursing Research Grant.</p> <p><i>\$5,000 (minimum) to \$25,000 (maximum) for 1 year</i></p> | 1 | \$0 |
| Collaborative Research & Innovation Opportunities (CRIO): Project, Program, Teams | <p>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> <p><i>Award values vary by CRIO program types ranging from \$250,000-\$1,000,000 annually with award durations ranging from three to a maximum of five years.</i></p> | 25 (includes 6 grants funded through the Alberta Cancer Prevention Legacy Fund [ACPLF]) | \$11,254,795.00 |

| Funding Opportunity | Description | Number of Active Grants/ Awards 2018-19 | Total Investments in 2018-19 |
|---|---|---|---------------------------------|
| Health Effects of the Alberta Wildfires | <p>In development with the Canadian Institutes of Health Research and the Canadian Red Cross, this grant supports research that works to minimize the health impacts that the provincial wildfires and subsequent evacuations have had on Albertans. The research grant focuses on: pediatric resiliency related to mental health and addiction; adult resiliency related to mental health and addiction; and occupational health (e.g., workforce PTSD, exposure to air pollution/smoke affecting the respiratory system).</p> <p><i>\$250,000 per year for a maximum of two years</i></p> | 2 | \$0 |
| Merck for Mothers | <p>A Partnership between AHS, AI, and Merck Canada, the Merck for Mothers initiative is a key investment to support research designed to help address health disparities and create health service improvements for Aboriginal women in Alberta.</p> | 1 | \$96,888 |
| Partnership for Research & Innovation in the Health System (PRIHS) | <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> | 19 (includes 1 grant funded through the ACPLF) | \$4,441,929 |
| Partnership - CIHR Applied Health Chairs | <p>The CIHR Applied Health Chair program targets specific population and public health research priorities that align with other strategic initiatives to maximize synergies and impact.</p> | 2 | \$46,250 |
| Partnership - CIHR Teams | <p>A CIHR program AI partnered with to fund a project that aims to advance Canadian research on bariatric care and medical management of severe obesity in adults as well as children and youth across the continuum of care.</p> | 1 | \$100,000 |
| Precision Health Grant - LSARP 2017 | <p>Alberta Innovates and Genome Alberta are pleased to provide support for the development of full applications for the Genome Canada 2017 Large Scale Applied Research Project Competition in Genomics and Precision Health. This support is intended to assist Alberta teams to be more competitive in the upcoming competition.</p> | 1 | \$0 |

APPENDIX B: STRATEGIC INVESTMENTS

| Funding Opportunity | Description | Number of Active Grants/Awards 2018-19 | Total Investments in 2018-19 |
|--|---|--|------------------------------|
| Translational Health Chairs | <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>10 (includes 1 grant funded through the New Investigator Award program)</p> | \$2,330,357 |
| Training and Early Career Development | <p>These grants and awards support the training of future leaders in the health research and innovation environment, so that they gain broad experience that will help them succeed in launching careers in academia, industry, government or elsewhere. This portfolio includes:</p> <ul style="list-style-type: none"> ▪ Graduate Studentships and Postgraduate Fellowships ▪ MD-PhD Studentships ▪ Clinician Fellowships <p><i>These awards range in value from \$30,000 to \$70,000 per year with career development allowances of between \$2,000 and \$5,000 per year. Visit Health Innovation’s TECD webpage more details on each active program.</i></p> | <p>191 (includes 11 grants funded through the ACPLF)</p> | \$8,601,256 |

- American Institutes for Research. (2012). Innovative methods in stakeholder engagement: An environmental scan (AHRQ Publication NO. 12-EHC097-EF). Rockville, MD: Agency for Healthcare Research and Quality. <https://effectivehealthcare.ahrq.gov/topics/stakeholders-engagement-others/research-2012-1/>
- Balas E & Boren S. (2000). Managing clinical knowledge for health care improvement. In: JH van Bommel & AT McCray (Eds.) Yearbook for medical informatics. (pp. 65-70). Stuttgart, Germany: Schattauer Verlagsgesellschaft mbH.
- Grant J, Cottrell R, Cluzeau F, Fawcett G. (2000). Evaluating “payback” on biomedical research from papers cited in clinical guidelines: applied bibliometric study. *BMJ*, 320:1107-11.



Suite 1500, 10104 - 103 Avenue
Edmonton, Alberta
T5J 4A7

Phone: (780) 423-5727

Toll-free: 1-877-423-5727

Fax: (780) 429-3509

E-mail: health@albertainnovates.ca

albertainnovates.ca

