

# A New Era of Sex and Gender Science

Impact Report  
2015-2022



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The work of the Institute of Gender and Health (IGH) at the Canadian Institutes of Health Research (CIHR) takes place across Turtle Island—a term used by some Indigenous Peoples' creation stories to describe the land mass known as the Americas—recognizing that our diverse community collaborates across many Indigenous traditional territories.<sup>1</sup> The Institute is grateful to continually learn from Indigenous people whose lands we share. We are committed to addressing the impacts of racist and colonial policies and histories in Canada by supporting research that strives to overcome health inequities, while valuing Indigenous lived experiences and ways of knowing.

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IGH's achievements have been made possible thanks to the contributions of the Institute team and Institute Advisory Board members.

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April 2023

# The World Needs Sex and Gender Science

For years, males were the default subject across all stages of research. Females were thought to be too variable and complex, in part due to their hormones and reproductive systems. Inattention to sex and gender biased findings and compromised scientific evidence.<sup>2</sup> The reproducibility crisis exploded and people died.<sup>3</sup>

Back in 2010, fewer than 20% of basic scientists, 25% of health systems researchers, and only one-third of clinical and population health researchers in Canada accounted for sex in their studies.<sup>2</sup> Sex chromosomes were often excluded from genome-wide association studies because of technical difficulties managing the differently sized X and Y chromosomes. Gender was virtually ignored.

Today, the integration of sex in health research proposals in Canada exceeds 90%. Gender is addressed in the majority of human research studies. The assessment of research excellence values the inclusion of sex and gender as a strength. Canada is recognized as a world

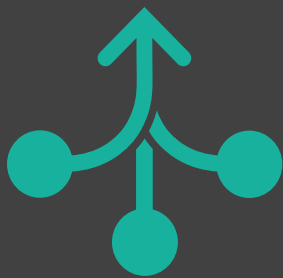
leader in sex and gender science, and the top producer of scientific articles in this field. Clinical practice guidelines are starting to change. Evidence exists to appropriately develop and implement policy in a way that addresses health inequities for women and girls, boys and men, Indigenous peoples in all their diversity and 2S/LGBTQI+ communities (Two-Spirit, lesbian, gay, bisexual, transgender, queer, intersex and additional sexually and gender-diverse people).

**The Institute of Gender and Health has been at the forefront of these shifts to make science more rigorous and inclusive with sex and gender. These are the transformative impacts of the Institute's work.**

# About the Institute of Gender and Health

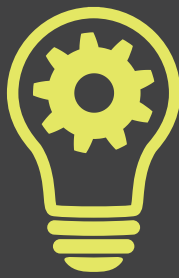
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## IGH Strategic Directions



### Integration

Transforming the health research ecosystem to foster the integration of sex and gender science in practice.



### Innovation

Growing the field, promoting innovative methods, new research approaches and discoveries in sex and gender science.



### Impact

Transforming health outcomes by ensuring knowledge generated about sex and gender is translated into improved health for everybody.

**IGH  
by the  
numbers**

**CIHR ranked #1 in the world**  
for **appropriate integration of sex, gender  
and intersectionality** in funding policies<sup>4</sup>

**27,274** completions of  
IGH's **three online  
training modules**

**60** **sex and gender guides**  
for peer review committees

**15**

sex and gender  
science chairs

**30**

IGH-related  
academic  
publications

**3**

Health  
Research  
Training  
Platforms

**4,675**

page views of IGH's **Sex  
and Gender in COVID-19**  
research guide

**35**

**major CIHR  
funding  
initiatives** from  
2015-2022

**23**

**IGH trainee  
chapters** at  
Canadian  
universities

**22,000**

Views of IGH's  
**sex and gender**  
**in peer review**  
YouTube video

The **IGH sex and gender infographic** is the

**2ND** **most viewed**  
**CIHR webpage**

# IGH is an Influencer

There are those that set international standards, and there are those that raise them. IGH does both.

By illuminating the need to integrate sex and gender into research and changing researcher behaviour, IGH is making science more rigorous and policies more inclusive, maximizing research impact and opening the door to new scientific discoveries.

## Researchers

IGH is requiring Canadian researchers to explain how sex and gender will be factored into their studies in all CIHR funding applications.

Are sex (biological) considerations taken into account in this study?

Yes  No

Are gender (socio-cultural) considerations taken into account in this study?

Yes  No

## Impact

An upsurge in sex and gender integration into CIHR research proposals from 2011-2022.



An increase in federal health research dollars accounting for sex and gender.



# Science breakthroughs

## Female E. coli antibodies

IGH and partners invested \$7M in 47 catalyst grants to encourage basic scientists to examine the impact of sex in their research. One project led by Paul Kubes supported the discovery of pre-existing E. coli antibodies in female mice, but not males. Further investigations will reveal whether these antibodies exist for other pathogens. In practice, this could also support the development of new immunotherapy treatments for men hospitalized with severe E. coli infections.

## Sex differences in chronic pain

CIHR-funded research led by Jeff Mogil resulted in the discovery of sex differences in chronic pain. In males, pain transmission is mediated by microglia, while an entirely different type of cell—likely the T cell—appears to carry out this function in females. This breakthrough could lead to the development of sex-specific medication for pain relief.

“When I first heard that researchers should be examining female and male mice, I was reasonably negative about that. But when we tried, we found a very obvious phenotype that was there in females and not males. Without any push from the Institute, I would never have done that.”

—PAUL KUBES,  
RESEARCHER AND PROFESSOR

“IGH was way ahead of the curve in saying the subjects of your experiments matter. Having a champion at a funding agency gives this field a legitimacy that we never would have had otherwise.”

—JEFF MOGIL,  
NEUROSCIENTIST AND PROFESSOR

## Peer reviewers

In 2018, IGH changed peer review requirements to ensure the strength of sex and gender integration is valued.

Please indicate your appraisal of the integration of sex as a biological variable as one of the following:

- STRENGTH
- WEAKNESS
- N/A

Please indicate your appraisal of the integration of gender as a socio-cultural variable as one of the following:

- STRENGTH
- WEAKNESS
- N/A

## Impact

A researcher's odds of being funded by CIHR are now higher if 2 of 3 peer reviewers score sex and gender as a strength.<sup>2</sup>



# IGH influences

## Research networks

IGH spurs research networks, including the Stem Cell Network and the Canadian Donation and Transplantation Research Program, to model how sex and gender can be integrated.

### SPOTLIGHT

The Canadian Consortium on Neurodegeneration in Aging (CCNA)

As a result of IGH investments and guidance, the CCNA introduced a Women, Gender, Sex and Dementia program and a six-component gender strategy.

Proportion of preclinical projects integrating sex rose from

**10 to 55%**

over two reporting periods in 2016.



Proportion of human projects integrating sex/gender rose from

**42 to 60%**

over two reporting periods in 2016.<sup>5</sup>



## Editors and journals

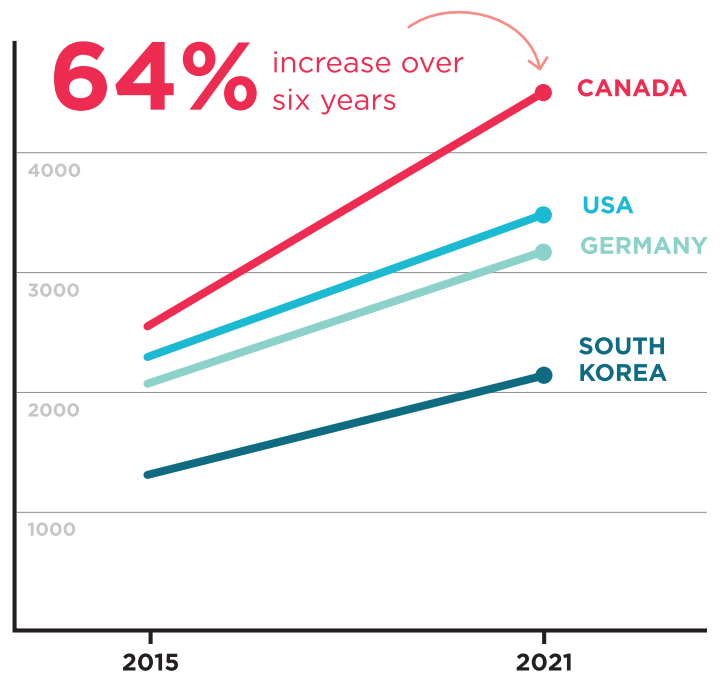
The Institute is improving the reporting of sex and gender considerations in science publications. Thanks to IGH's influence, **Elsevier**—one of the world's largest health science publishers—is planning to implement new mandatory sex and gender checklists for authors and peer reviewers across their health and medical science journals.

“Having IGH so far ahead of any other funder means they have always been the authoritative source that Elsevier could refer to. They encouraged Elsevier to do better, and to do more.”



—**HOLLY FALK-KRZESINSKI**,  
VP OF RESEARCH INTELLIGENCE, ELSEVIER

## Canada is #1 in the world in sex and gender science publications, and the lead is growing



The number of PubMed publications with the keywords sex, gender and the country.



## Policy makers

IGH proactively brings evidence to Canadian health portfolio policymakers to shape government decisions, including:

- CIHR's first Sex and Gender-based Analysis Plus Framework (SGBA+);
- Treasury Board of Canada's Gender-based Analysis Plus (GBA+) Evaluation Guide;
- Statistics Canada's population survey design, introducing new standards for assessing gender identity and lived gender, including Two-Spirit and trans identities; and
- The World Health Organization's course on incorporating intersectional gender analysis into research on infectious diseases of poverty.

"IGH has been the backbone of our research funding and our collaborations across the world. Some of our research, especially our first trans youth survey, was cited by the BC Government when they announced adding gender identity and expression to the BC Human Rights Code."

—ELIZABETH M. SAEWYC,  
DIRECTOR, UBC  
SCHOOL OF NURSING



### SPOTLIGHT

#### Canadian drug and medical device guidelines

IGH shaped Health Canada's federal guidelines on sex and gender requirements for medical device submissions, and mandatory reporting by industry on the submission of disaggregated sex, race and age data for drugs and vaccines.



#### Conversion therapy and Canadian blood donation guidelines

The federal ban on conversion therapy and a major change in Canadian blood donation guidelines to include men who have sex with men was influenced by researchers at the IGH-funded Two-Spirit Dry Lab. The Lab's mission is to improve the health of Two-Spirit people—a broad term for Indigenous Peoples' fluid and non-binary expressions of gender and sexual diversity.

## Clinical practice guidelines

IGH's influence is changing the way that professional societies create clinical practice guidelines for patient care. As a result, the Canadian Cardiovascular Society has committed to issuing separate recommendations for each sex.<sup>6</sup>

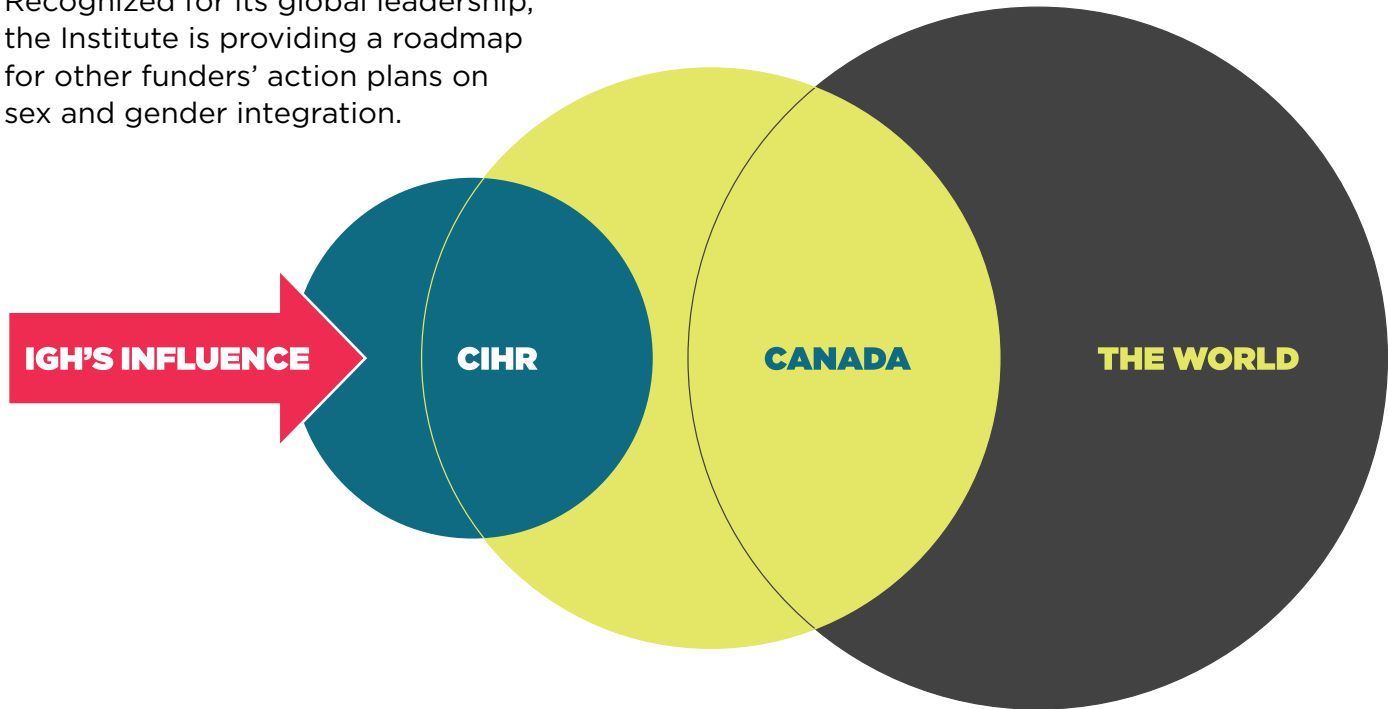
"IGH proposed that the Canadian Cardiovascular Society conduct a pilot project to update a guideline on heart attack management. The pilot was proof that one can embed a sensitivity to sex and gender in the rigorous process of gathering evidence for clinical practice guidelines."

—SEAN MCMURTRY, CLINICIAN SCIENTIST



# IGH's influence around the world

Recognized for its global leadership, the Institute is providing a roadmap for other funders' action plans on sex and gender integration.



## Canadian funders and charities

The Kidney Foundation of Canada, the Heart and Stroke Foundation, and Brain Canada have adopted IGH's approach to require sex and gender integration in research protocols.

"At Brain Canada, we didn't really have the tools or training to understand how researchers could take sex and gender variables into consideration until we met the IGH. IGH helped us think about how we could include sex and gender in the research process."

—INEZ JABALPURWALA,  
FOUNDING CEO  
OF BRAIN CANADA



## The European Commission

Building on IGH's recommendations as part of Horizon Europe's Expert Group on Gendered Innovations 2, the European Commission now integrates sex and gender into its funded research and innovation content as a default requirement for all Horizon Europe Framework Programmes beginning in 2022.

## ZonMW, the Netherlands Organization for Health Research

ZonMW was inspired to translate and adapt IGH's guidelines and tools to mainstream sex and gender considerations in research programs for Dutch researchers and peer reviewers.



## The US National Institute of Health (NIH)

IGH's scholarly publications about implementing and evaluating various sex and gender-based interventions in a national funding agency informed the development of the NIH's *Sex as a Biological Variable* policy.



**“Canada was the first large-scale country with a national research funding program that put policies out related to sex and gender in health research. What they did was set a standard, and it raised the bar from the beginning. Now I can point to IGH and say, ‘if they can do it, there’s no reason why we can’t.’”**

—JANINE CLAYTON, DIRECTOR,  
NIH OFFICE OF RESEARCH ON WOMEN'S HEALTH

## SPOTLIGHT



### iKASKADE

IGH participates in GENDER-NET Plus—a transnational consortium that invests in promoting sex and gender in research. Four of the 13 funded projects are led by Canadians, including iKASKADE. This project provides a greater understanding of gender and sex-specific prescribing cascades for older adults across six countries, offering a pathway to personalized medicine to prevent adverse drug events while elevating the international research community's consideration of sex and gender within geriatric pharmacology and medicine research.



“This novel funding opportunity has been instrumental in bringing together researchers and creating new collaborations that would otherwise not have existed.”

—iKASKADE RESEARCH TEAM

## IGH's Transformative Impact

As a scientific leader, IGH is advancing science and driving a mindset shift around the importance of including sex and gender in health research. The Institute is not just progressing on its own, but bringing the entire global research ecosystem along with it.

CIHR STRATEGIC PRIORITIES  
ADVANCED BY OUR WORK

### PRIORITY A

Advancing Research  
Excellence In  
All Its Diversity



# IGH Builds Capacity

IGH resources have proven critical to furthering sex and gender science and catalyzing change.

One of IGH's pivotal successes has been creating supportive tools and products necessary to facilitate scientific evolution. Even those researchers who are not sex and gender science experts are recognizing that they need to address sex and gender differences—and increasingly from an intersectional perspective.

## Advancing next gen science

### Training Modules

Three online sex and gender training modules that many academics credit with building the capacity of the health research enterprise have now been completed by almost 30,000 users. **95% of course completers** report an intent to improve their behaviour with respect to sex and gender in health research.<sup>2</sup>

Module 1  
**SEX AND GENDER  
IN BIOMEDICAL  
RESEARCH**



Module 2  
**SEX AND GENDER  
IN PRIMARY  
DATA COLLECTION  
WITH HUMANS**



Module 3  
**SEX AND GENDER  
IN THE ANALYSIS  
OF SECONDARY  
DATA FROM HUMAN  
PARTICIPANTS**



“Everyone in our Faculty of Medicine’s graduate school is now required to do one of the IGH sex and gender training modules as part of their professional skills course. This wasn’t something that the Faculty of Medicine paid much attention to before.”

—IAN GRAHAM, PROFESSOR, UNIVERSITY OF OTTAWA



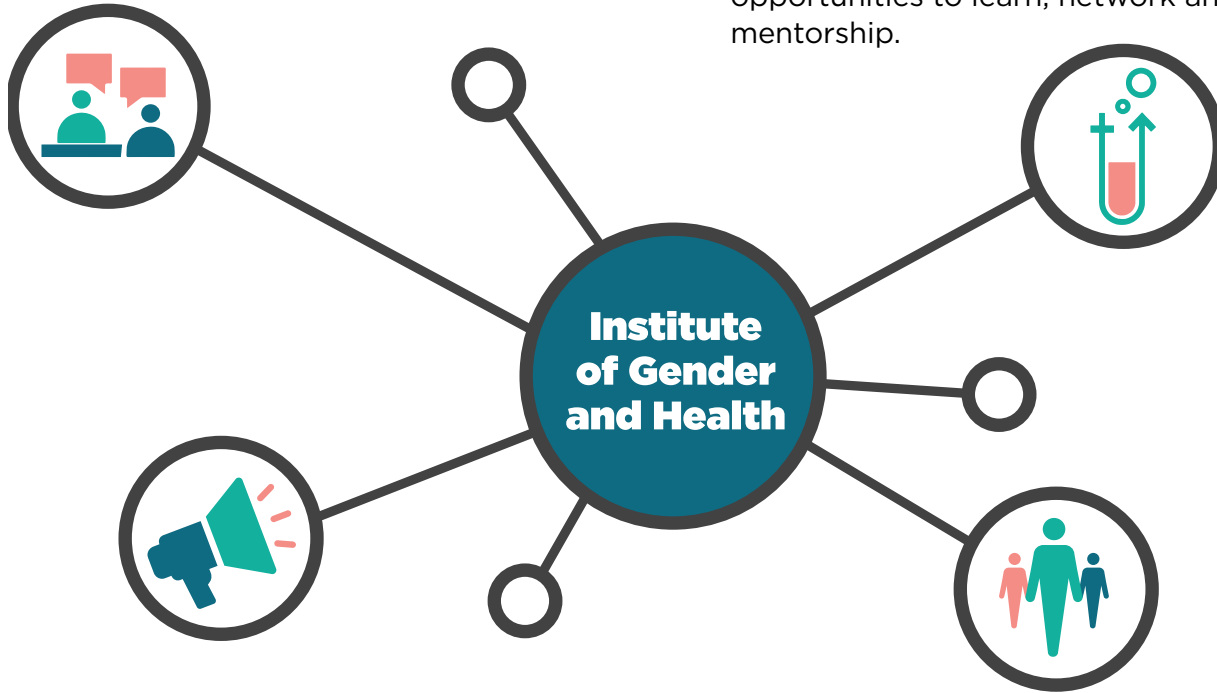
## Facilitating connections

### Women's Health Clinical Mentorship Grants

Developing capacity for the next generation of women's health clinician-researchers through 13 grants totalling \$650,000 in 2020-21.

### IGH Trainee Network

A network of undergraduate, graduate and post-doc trainees across 23 Canadian academic institutions who have an interest in sex and gender in health research. The network creates opportunities to learn, network and receive mentorship.



### Sex and Gender Champions

Researchers with sex and gender expertise who are required to participate in some CIHR-funded initiatives. Champions convene three times a year through a Community of Practice to discuss conceptual developments and challenges in sex and gender science, growing the field's intellectual foundation.

### Sex and Gender Science Chairs

A cadre of discipline-specific Chairs tasked with undertaking in-depth sex and gender-based investigations to drive innovation in their respective fields. IGH invested \$10.3M to support 15 Chairs, with contributions from 11 of the other 12 CIHR Institutes.

“As researchers, we don't often get the time to advance our own thinking on sex and gender. Creating a community of practice is one really great way to do it, and the IGH has been quite progressive to create that opportunity.”

—NANCY POOLE, SEX AND GENDER CHAMPION COMMUNITY OF PRACTICE LEAD

“My research concerns LGBTQI+ wellness and resilience, focusing on stress physiology. The hope is to give something back to the community with the Chair.”

—ROBERT-PAUL JUSTER,  
CIHR SEX AND GENDER  
SCIENCE CHAIR



GILLIAN EINSTEIN,  
COGS FOUNDER

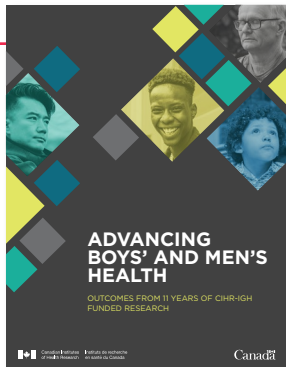


**“IGH helped fund the first meetings of the Canadian Organization of Gender and Sex Research (COGS), including supporting scholarships for graduate students and post-docs. They’re playing a major capacity building role in this area.”**

**SPOTLIGHT**

**Boys’ and Men’s Health**

Learn more about the many impacts of IGH’s 11-year \$15 million research investment on boys’ and men’s health.



**Factsheets and guidelines**

**Peer review guidance**

IGH created a YouTube video—viewed over 22,000 times—to instruct evaluators on how to rank sex and gender integration as well as a peer review manual and checklists, and unique training packages for 60 CIHR peer review committees each competition cycle.

**COVID-19 Factsheet**

IGH prepared a guide for researchers and peer reviewers on how and why sex and gender must be considered in COVID-19 research, from an intersectional perspective.



**IGH’s Transformative Impact**

By not just showing researchers why but how, IGH is galvanizing a broad community of scientists to apply sex and gender science. Researchers are increasingly equipped to approach their work in a different way, recognizing that science without sex and gender is simply not good science.

CIHR STRATEGIC PRIORITIES  
ADVANCED BY OUR WORK

**PRIORITY B**  
Strengthen  
Canadian Health  
Research Capacity

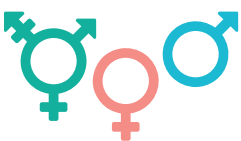


# IGH is an Equity Champion

CIHR's mandate is to improve the health of Canadians.  
If health is not improving, it is clear that a new approach is needed.

That is why IGH is integrating equity, diversity and inclusion (EDI) throughout the research ecosystem. The goal is to ensure that the Institute's engagement and funding opportunities actively involve communities that have been underrepresented in health research, including 2S/LGBTQI+ and Indigenous communities.

## IGH successfully advocates for:



### **Sex and gender identification**

Grant applications and event registration forms now include self-identification measures to collect sex assigned at birth and gender information.



### **French language accommodations**

CIHR introduced a 20% increased page limit allowance for grant applications submitted in French to respect culturally-appropriate linguistic expression.



### **Funding community organizations**

IGH expanded funding eligibility requirements so that health research grant funding is made available to community organizations and not only academic researchers—a major shift in the way that CIHR has operated.





## The Indigenous Gender and Wellness Ideas Fair and Learning Circle

Hosted in partnership with the Kahnawake First Nations Reserve, and guided by an Indigenous-led steering committee, this three-day gathering welcomed 170 First Nations, Métis and Inuit community members to share stories about Indigenous wellness and brainstorm solutions to be funded by CIHR.

## Reaching new grantees

In 2021-22, IGH succeeded in extending the reach and uptake of its initiatives, as evidenced by a higher proportion of first-time CIHR grantees in the following initiatives.

**“The Ideas Fair and Indigenous Gender and Wellness Initiative were really reconciliation in all earnestness. Rather than defaulting to Western ways of knowing and being, which are not about relationships or healing, we were given the opportunity to do things differently. That is huge.”**

**HARLAN PRUDEN,**  
NEHIYÔ/ FIRST NATIONS CREE,  
CO-FOUNDER OF THE  
TWO-SPIRIT DRY LAB



# Knowledge Mobilization Deliverables

Projects that support equitable outcomes



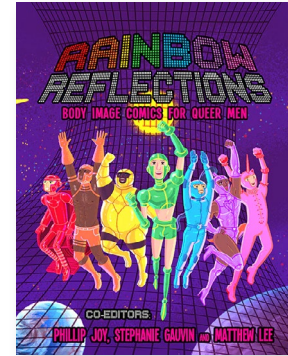
## GoodHead

A website with mental health resources for gay, bisexual and queer men, which helps them locate mental health services in Ontario.



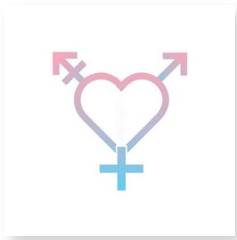
## Queering Cancer

A website with resources to help 2S/LGBTQI+ communities navigate their cancer experiences, while supporting healthcare providers caring for queer and transgender patients.



## Rainbow Reflections

Trainees working on 2S/LGBTQI+ wellness developed a comic book that convened artists from over 40 countries, blending personal experience and scholarly research on men's health, masculinity and self-worth.



## TransForming Rounds

A podcast that improves access to inclusive and patient-centred care for transgender and gender diverse individuals in Canada.



## JoyPop

An app that aims to increase health knowledge and services for young men, including Indigenous youth, who have experienced childhood sexual abuse by reducing trauma-related symptoms.



## Wiiji

Created in partnership with the Nookiwin Tribal Council, the app—which means “to help” in the Indigenous Ojibway language—aims to lessen instances of lateral violence and negative behaviour at work.



## Immigration Services Chatbot

Collaborating with Toronto-based Costi Immigrant Services—the largest service provider for newcomers to Canada—researchers developed a chatbot that allows new immigrants to virtually access settlement information and resources, which has since become a component of the Orientation to Ontario program.



## Choose to Move

A scalable, choice-based physical activity intervention for community-dwelling, low-activity men aged 60 and up. Men who followed the 12-week program were 3.3 times more likely to meet physical activity guidelines. Thanks to the program's success, the initiative became a provincial program in British Columbia (BC).<sup>7</sup>



## Infotility

The first large-scale survey of Canadian men's knowledge of male fertility led to the creation of this new app. Before using the app, only 50% of men could name risk factors for male fertility, such as frequent cycling and wearing tight pants, but app use increased this to 94%.<sup>8</sup>

## The science of science

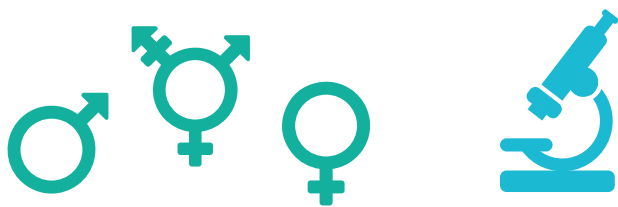
IGH published 30 articles to promote “the science of science” related to sex and gender. These data-driven insights inform EDI-driven program development at CIHR.

### Female investigators more likely to integrate sex and gender

Across every CIHR competition from 2011-2019, applications with female principal investigators were more likely to integrate sex and gender than those who identified as male.<sup>2</sup>

### Sunsetting programs that have bias

An IGH evaluation of 2011-2016 CIHR program funding found that gender gaps in grant funding were caused by less favourable assessments of women as principal investigators, and not on the quality of their research. CIHR responded by removing its Foundation Grant program, which focused on the scientist, not the science.<sup>9</sup>



### Raising awareness of gender bias in funding amounts

IGH discovered and publicized that female applicants received less grant funding than male applicants.<sup>10</sup>

### Choice of interventions to mitigate bias

An IGH-commissioned study on bias in peer review determined that blinding reviewers to the names and genders of applicants was unlikely to be effective, and therefore the potential strategy was discarded.<sup>11</sup>

### Gender-sensitive policies for COVID-19 research

In an evaluation of a COVID-19 funding opportunity, IGH found that women scientists were less likely to apply. After seeking their feedback, the Institute learned they needed more time, as they tended to shoulder a disproportionate burden of care during the pandemic. Offering deadline extensions led to more women applicants and a greater proportion of grants awarded to female compared to male scientists, which then resulted in more funded grants that considered sex and gender in COVID-19 research.<sup>12</sup>

## IGH's Transformative Impact

Taken together, these EDI approaches represent a major shift in the way that health research is done, with Canada at the helm. These initiatives are just the strategy—achieving social justice is the goal.

CIHR STRATEGIC PRIORITIES  
ADVANCED BY OUR WORK

**PRIORITY C**  
Accelerate the Self-Determination Of Indigenous Peoples In Health Research



**PRIORITY D**  
Pursue Health Equity Through Research



**PRIORITY E**  
Integrate Evidence In Health Decisions



# IGH of the Future

Over the past decade, IGH has strengthened its scientific leadership in the field of sex and gender science. The Institute is building and evolving the field by anticipating where the science is going, setting the health research agenda and then providing the infrastructure and funding opportunities for the best and brightest Canadian researchers and community groups to move the dial forward.

**IGH is continually on the cusp of ever-evolving, cutting-edge research, meaning the Institute's work is far from done.**

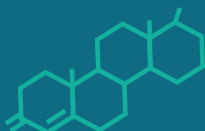
Right now, the Institute is grappling with forward-looking questions, such as:



**Should drug dosing differ based on sex and gender?**



**How can we better include transgender and non-binary people in health research?**



**In what way will hormonal and sex-based supplementation affect science research?**



**When will clinical trials include everyone, thereby increasing trust in government policies and science?**

IGH's vision for the future is to grow sex and gender science from its infancy into a full-fledged, internationally-recognized scholarly field of study with Canadian researchers at the forefront of scientific progress.

**To get there, IGH will be focused on:**

- ✓ Examining emerging areas of discovery, incentivizing more scientists to consider sex as a biological variable and gender+ as a social variable;
- ✓ Expanding intersectional analysis throughout the entire health research ecosystem;
- ✓ Bridging the policy-practice divide to shape sex- and gender-transformative health systems where everyone can access the care they need;
- ✓ Mobilizing research knowledge into impact;
- ✓ Investing in community co-created health research with 2S/LGBTQI+, racialized and Indigenous communities;
- ✓ Building trainee and early career researcher capacity in sex and gender science;
- ✓ Strengthening Canada's position as an international leader on sex and gender in health research and a leading resource for sex and gender science; and
- ✓ Transforming women's health in Canada.

**SPOTLIGHT ON WHERE WE'RE HEADING**

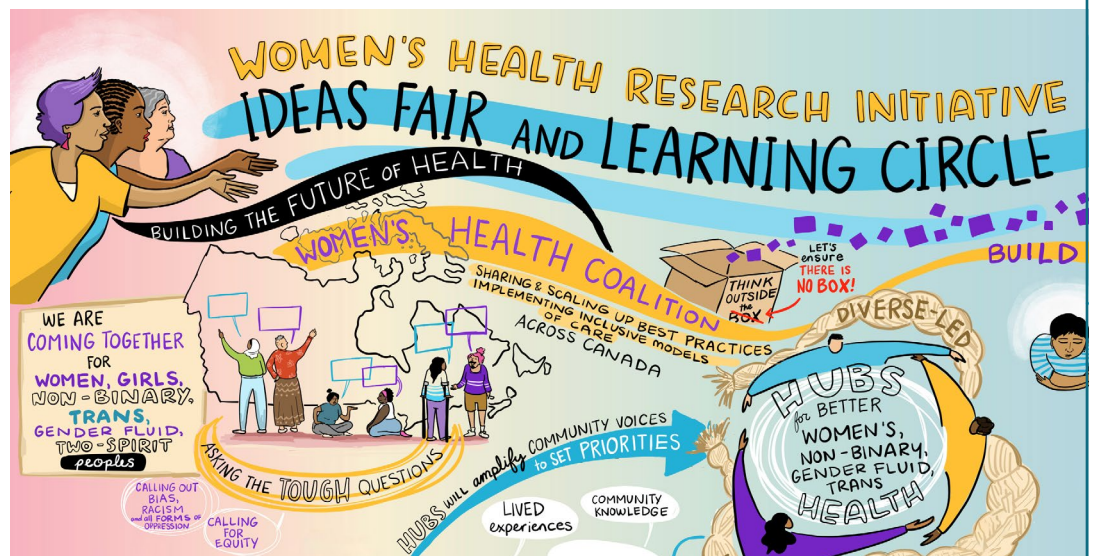
**Improving women's health**

**National Women's Health Research Initiative**

A \$20M Government of Canada investment in Budget 2021 aims to improve women's health services through the Pan-Canadian Women's Health Coalition and Women's Health Innovation Grants, facilitated through IGH.

**Ideas Fair and Learning Circle**

A 2022 gathering of potential applicants to the Pan-Canadian Women's Health Coalition united scientists and community members to discuss challenges in women's health, develop solutions-based grant proposals and identify priority areas for future investment.



▶ Graphic recording capturing the stories and insights shared during the National Women's Health Research Initiative Ideas Fair and Learning Circle.



Change takes time and requires active, ongoing support.

The more IGH grows the field of sex and gender science, the faster researchers will accelerate innovation. By building capacity in order to dig deeper, there will be an expansion of the rich scientific discoveries that researchers in the field are just beginning to uncover.

There are many opportunities on the road ahead—opportunities that can only emerge because of the significant contributions IGH has made to put sex and gender considerations firmly on the health research map.

“I’m seeing individuals that have included both sexes in their research and when they don’t get the same data, they are having a rough time thinking: ‘How do I analyze what’s going on?’ When I think about that and about the future, the need for IGH is only going to grow.”

**ELIZABETH RIDEOUT,**  
CIHR SEX AND GENDER  
SCIENCE CHAIR



**The momentum IGH has created presents massive potential to continue to reshape science for the better.**

**Have you considered the possibilities?**





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