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Mid-term Program Evaluation of the Joint Canada-Israel Health Research Program (JCIHRP)

FINAL REPORT

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This external evaluation was commissioned by the International Development Research Centre on behalf of the four funding agencies: The Azrieli Foundation, The Canadian Institutes of Health Research, the Israel Science Foundation and IDRC.

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1 Executive summary

The Joint Canada Israel Health Research Program (JCIHRP) is a seven-year C\$35 million partnership between Canada's International Development Research Centre (IDRC), the Azrieli Foundation (AF), the Canadian Institutes of Health Research (CIHR) and the Israel Science Foundation (ISF). The Program awards grants for international collaborative health research involving researchers from Canada, Israel and low- and middle-income countries (LMICs). The Program is currently in its first phase (2015-2022) and has issued five funding calls to date of which the first four have focused on neurosciences, immunology, cancer and neurobiology, funding 24 projects in total.

The aim of the Program is to advance research and discovery in the field of biomedical science, to encourage scientific collaboration between researchers and trainees in Canada and Israel, and to build capacity in LMICs by fostering scientific relations and collaborations between researchers and trainees. The Program is run by a Governance Committee, which is the highest level decision-making body, and a Program Directors Working Group, which is in charge of implementation. Both have equal representation from the four funding partners.

This evaluation has assessed the implementation of the Program to date and the extent to which the Program objectives are being achieved. The evaluation team employed a mixed methods approach including document and data review, a beneficiary survey and a program of stakeholder interviews.

Key findings

Appropriateness and relevance

- All Governance Committee members and Program Directors feel that the objectives and priorities of the JCIHRP are well aligned with those of their respective organizations.
- The JCIHRP funding beneficiaries that were interviewed unanimously agreed that the Program fills a gap in the research funding landscape, fulfilling a demand for basic research collaborations between Canada, Israel and LMICs. In turn, all stakeholders interviewed believe that the program design is well suited to meet its objectives.
- The review of grant applications for JCIHRP funding is done by an adjudication panel chaired by internationally renowned scientists. The composition and quality of the panels, the assessment criteria and adjudication process are appropriate for the Program and meet international standards according to the Panel Chairs.
- At least 60% of Canadian and Israeli principal investigators (PIs) who responded to our beneficiary survey were very satisfied with the scope of the Program and the amount of funding on offer. At least 49% of these PIs were satisfied or very satisfied with various aspects of the application and post-award processes.

Effectiveness and performance

- At least 60% of survey respondents from Calls 1 to 3 (PIs, trainees and LMIC collaborators) strongly agreed that their projects met expected outcomes such as advancing biomedical research and discovery, strengthened research capacity through training of students and postdoctoral researchers, development and strengthening of collaborations and professional development of individuals. These findings were echoed in interviews with beneficiaries.
- While numerous examples of personal development were reported by LMIC beneficiaries, wider research capacity building in LMICs is less evident.
- Beneficiaries interviewed stated that their experience of research collaborations within the JCIHRP has been very positive, providing them the opportunity to share data, exchange ideas, build knowledge and in some cases, gain access to equipment and infrastructure they would not have

otherwise. Survey analysis also showed that 93% of the respondents had not collaborated with their JCIHRP project partners previously. Thus, the Program is facilitating new collaborations.

Emerging results

- The survey and interviews indicate that the main expected outputs and outcomes emerging from the funded projects are strong advances in scientific knowledge, development of technical skills, strengthened international partnerships, knowledge and people exchange as well as expansion of professional networks.
- Project participants have produced papers, presented at conferences, visited their research partners' labs and trained students and postdoctoral fellows, about 60% of whom are women.
- For beneficiaries, the main unexpected outcome of JCIHRP participation has been the emergence of new projects and funding applications either with their JCIHRP partners or others including non-academic partners.

Value and sustainability

- 94% of survey respondents and all interviewees felt that the JCIHRP adds value above and beyond other funding opportunities. The opportunity to collaborate with researchers from Canada, Israel and LMICs was cited as the main contributor to this added value.
- Whether the collaborations generated will be sustained beyond the JCIHRP project will depend on the outcomes of the current projects and availability of follow-on funding. A number of researchers funded in the early JCIHRP calls have already progressed in this direction.

Conclusions

The JCIHRP funders have worked effectively to ensure alignment with their diverse mandates, processes and objectives to create a system that works for all. The adjudication process, which meets international standards, enables the highest quality proposals and best teams to be funded within each call. Moreover, evidence gathered in this evaluation suggests that the intended outputs and outcomes of the JCIHRP are already being achieved to some extent.

High quality international collaborations are being funded, bringing together complementary expertise and alternative perspectives, which in turn is providing a solid basis for expanding networks, advancing research and facilitating professional development. Importantly the majority of these collaborations are new and there is some evidence of these being sustained and/or broadened. That said, the evidence for capacity building in LMICs and wider impacts beyond the immediate project team is weaker.

Recommendations

In light of the evaluation findings, the evaluators would like the funders to consider the following recommendations:

- Strategic selection of future annual themes based on capacity and needs assessments to enable desired program impacts
- Further clarification of the involvement of LMIC partners recognizing the tension between the objectives of supporting high-quality scientific collaborations and capacity building
- Elaboration of the purpose and scope of the capacity building element from both the human and organizational perspectives
- Facilitation of new sustainable international networks and knowledge exchange through organizing meetings for all project teams funded under a given call and establishing an alumni platform
- Increased marketing of the funding opportunity and dissemination of the value of the program via social media and direct outreach to researchers, including through conferences and institutional research offices

* * *

2 Governance Committee Endorsement

The Governance Committee has received and approved Technopolis' Mid-term Evaluation of the Joint Canada-Israel Health Research Program. Overall, Committee members endorse the quality of this evaluation report. The evaluators have provided a thorough and evidence-based analysis of the evaluation questions.

The Governance Committee and agency staff have taken advantage of opportunities to inform, question, and support the external evaluators. At the same time, Technopolis was fully independent in conducting the external evaluation and in reaching the conclusions presented in this report.

The Governance Committee invited the evaluators to provide recommendations to inform a possible renewal of the program. The Governance Committee welcomed these recommendations. In light of the progress achieved and emerging results reported in this evaluation, the Governance Committee committed to discuss possible funding for a new program.

Governance Committee members:

Benjamin Geiger for ISF
Dena Libman for Azrieli Foundation
Jean Lebel for IDRC
Michael Strong for CIHR

August 15, 2019

* * *

3 Introduction

Canada's International Development Research Centre (IDRC) and partners (the Azrieli Foundation [AF], the Canadian Institutes of Health Research [CIHR] and the Israel Science Foundation [ISF]) commissioned Technopolis to undertake a program evaluation of the Joint Canada-Israel Health Research Program (JCIHRP). This document is the final report of the evaluation and showcases our findings and recommendations.

The Program – which has been issuing annual calls since 2015 – aims to advance research and discovery in the field of biomedical science, encourage scientific collaboration between researchers and trainees in Canada and Israel, and build capacity in low- and middle-income countries (LMICs) by fostering scientific relations and collaborations between researchers and trainees.

This study aimed to strengthen the body of evidence regarding the design, implementation and effectiveness of the JCIHRP. Specifically, this study assessed the implementation of the Program to date, the extent to which the program objectives were achieved and gathered evidence to inform discussions on the second phase of the JCIHRP.

The study focused on the first 4 calls of the Program – from 2015 to 2018 – which included neuroscience, immunology, cancer and neurobiology. Assessment of project performance was out of scope for the current evaluation.

The evaluation team employed a mixed methods approach including document and data review, a survey of funding beneficiaries (principal investigators [PIs], LMIC collaborators and trainees) and a program of stakeholder interviews (with Governance Committee members, program directors, adjudication panel chairs and funding beneficiaries) to address the evaluation questions. A detailed methodology (including a breakdown of the interviews) is available in Appendix A, while a breakdown of survey respondents by call, role and geography can be found in Appendix G.

The document is further structured into the following sections

- Overview of the Joint Canada-Israel Health Research Program
- Effectiveness and performance
- Emerging results
- Value and sustainability
- Conclusions and lessons learned
- Recommendations

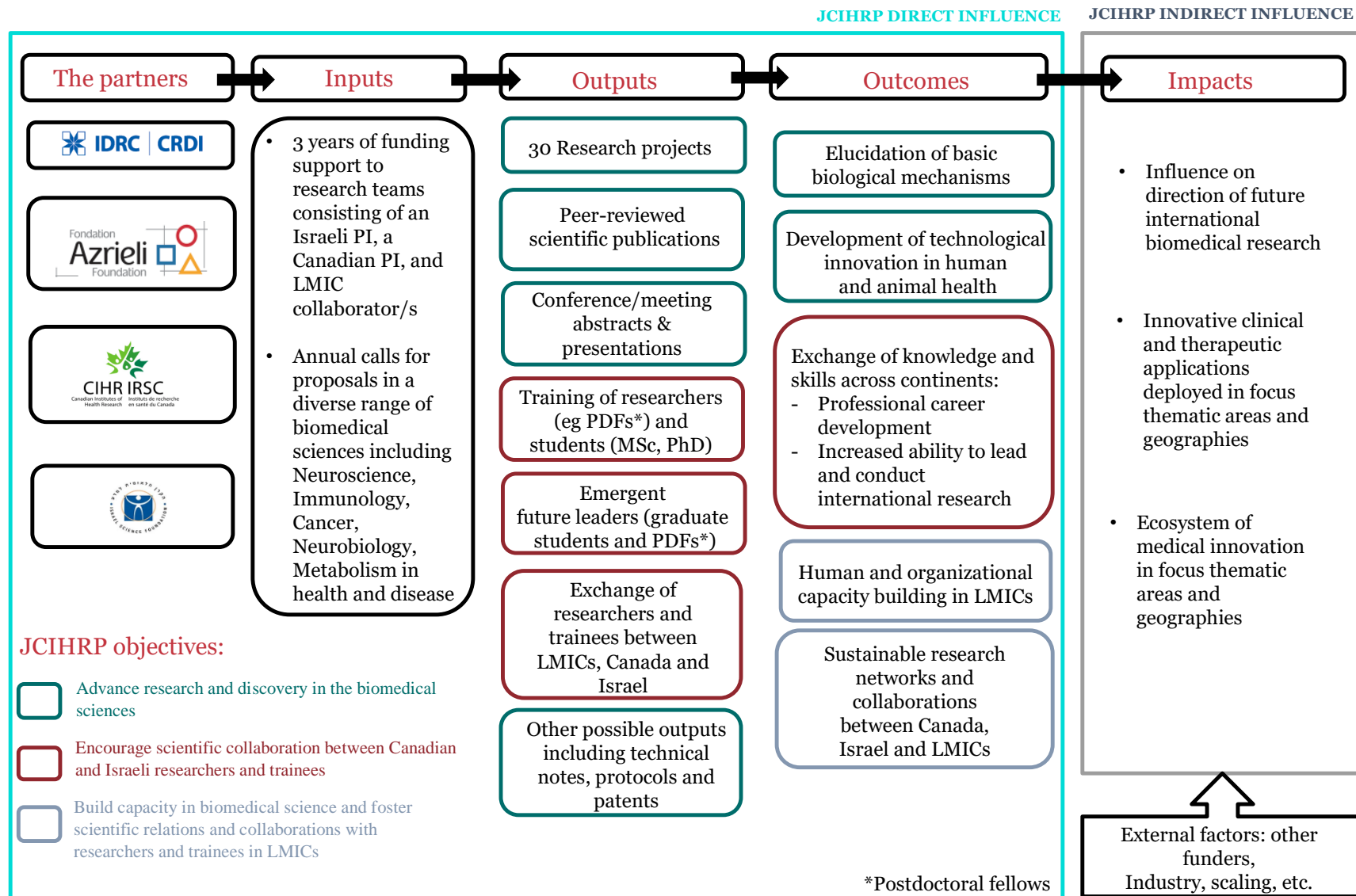
The survey and interview questionnaires and survey analysis are presented as annexes to the main report.

4 Overview of the Joint Canada-Israel Health Research Program

4.1 The Program's origin and aims

The JCIHRP is a seven-year C\$35 million partnership between four organizations: the IDRC, AF, CIHR and ISF. The Program emerged from an initial engagement around 2013 between CIHR and ISF facilitated by the Israeli ambassador to Canada to explore opportunities for collaboration between that would provide sizeable funds to a small number of very high-calibre scientific collaborations. As the funding for the Canadian component was to come from the Ministry of Foreign Affairs, the IDRC was

Figure 1 JCIHRP theory of change (2015-2022)



brought on board. A Memorandum of Understanding (MoU)¹ was signed in 2014 between the IDRC, CIHR and ISF. The AF officially came on board in 2015².

The aim of the Program as set out in the MoU was to provide funding for Canadian and Israeli researchers in order to facilitate collaboration between world-class research teams working in novel and cutting-edge areas of biomedical research¹. To accommodate IDRC's funding mandate³, the partners agreed to integrate researchers from LMICs in each JCIHRP collaboration to provide capacity building opportunities and to support potential leaders and trainees in gaining research expertise⁴. Consequently, the Program is currently designed to address three core aims⁴:

- To advance research and discovery in the biomedical sciences
- To encourage scientific collaboration between researchers and trainees in Canada and Israel
- To build capacity in biomedical science and foster scientific relations and collaborations with researchers and trainees in LMICs

These objectives are also articulated in the JCIHRP's theory of change (Figure 1), which draws connections between the support provided by the program partners (inputs) and the outputs and outcomes they are expected to generate. For the first phase of the JCIHRP (2015-2022), the theory of change is that *"fostering collaborative health research in different areas of biomedical science will bring enduring changes and medical innovation across the globe"*.

The Program is currently in its first phase (2015-2022), during which up to 30 research projects will be funded⁴. A second phase of the JCIHRP, beyond 2022, is currently being considered by the partner agencies.

4.2 Program structure and governance

The JCIHRP integrates the four funding partners' different mandates, systems and interests, in its design and governance structure.

The Governance Committee is the highest-level decision-making body while the Program Directors working group is in charge of implementing the Program (Figure 2). Both have equal representation from the four partners. Additional operational roles within the Program are taken on by the funding partners in line with their own particular expertise and funding contribution to the Program. For example, the IDRC leads the Canadian component, administering grants to the Canadian and LMIC counterparts (providing funds totalling C\$15 million [approx. NIS 42 million] over 7 years¹) and coordinating monitoring activities. The ISF represents and funds the Israeli side of the Program (totalling NIS 52.5 million [approx. C\$18.8 million] over 7 years¹) and organizes the adjudication process in partnership with CIHR. The CIHR does not provide grant funding but is the main coordinator of the funding opportunity. For example, it coordinates the call text preparation, hosts the electronic adjudication system and suggests peer reviewers³. As such, it has contributed around C\$3.5 to 5 million [approx. NIS 9.8 to 14 million] to the initiative¹. The AF contributes C\$5 million [approx. NIS 14 million] worth of funds which are administered by the IDRC.

Projects are awarded funding on a competitive basis following a peer review-based adjudication process that is coordinated in alternate years by the CIHR and ISF in Canada and Israel respectively³. JCIHRP-funded research teams are led by a Canadian PI and an Israeli PI in collaboration with an LMIC collaborator. Grants have a 3-year duration and funding of up to a maximum of C\$1.17 million [approx. NIS 3.3 million]⁴.

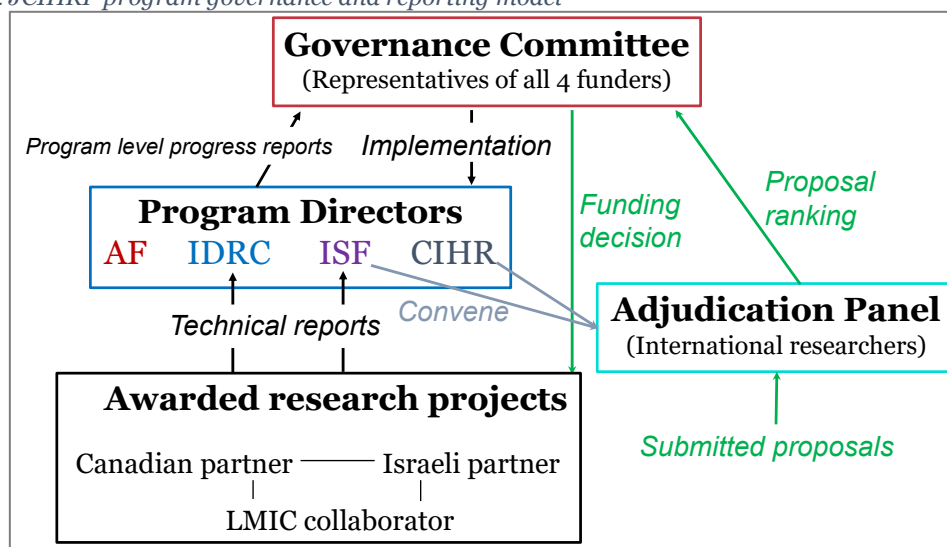
¹ ISF, CIHR and IDRC (2014) Memorandum of Understanding concerning the Joint Canada-Israel Health Research Program

² 2015 Governance Committee Agenda and Minutes

³ Scoping interviews

⁴ Santos, F. (2018) Joint Canada-Israel Health Research Program Progress Report (2015-2017)

Figure 2 JCIHRP program governance and reporting model



4.2.1 Governance Committee

The Governance Committee consists of 8 members, 2 from each funding partner, all of whom are high-level members of staff within their respective institutions.

The Governance Committee in coordination with the Program Directors (see Section 4.2.2 below) is responsible for:

- All significant programing and funding decisions
- The strategic direction and priorities of the Program
- The criteria and process for the evaluation of proposals, and the approval of research proposals for funding
- Acting as ambassadors for the Program
- Overseeing, monitoring and evaluation of the Program

4.2.2 Program Directors working group

Each funding partner also appoints a Program Director to oversee the operational and administrative aspects of the Program. The Program Directors meet on a regular basis and are responsible for Program implementation and promoting communication and coordination among the funding partners, ensuring that the annual Program implementation timeline is followed⁵. This timeline is divided into four phases: 1) the funding opportunity development and application phase; 2) the eligibility review and selection phase; 3) the research phase and; 4) the reporting and monitoring phase. Deploying these phases involves shared effort and costs from the funding partners.

The Governance Committee and Program Directors are also responsible for appointing members to the grant adjudication panel. Following the adjudication process, the Program Directors working group presents the list of the adjudication panel's top ranked proposals to the Governance Committee, which in turn makes the final funding decisions⁵.

⁵ Santos, F. (2018) Joint Canada-Israel Health Research Program Progress Report (2015-2017)

5 Appropriateness and relevance

5.1 Alignment with the funding partners' objectives and priorities

All Governance Committee members and Program Directors stated in interviews that the objectives and priorities of the JCIHRP were well aligned with those of their respective organizations. Our analysis also found that the Program's aims accommodate IDRC's LMIC and capacity building focus, CIHR's priorities to support health research and its translation into better health, ISF's mandate to support basic research in Israel and AF's focus on funding research and postgraduate education, mainly in Canada and Israel.

Table 1 Relevance of the JCIHRP mission to strategic priorities of funding partners

JCIHRP guiding principles ⁶	JCIHRP strategic priorities ⁷	Funding partner strategic priorities	
<p><i>Scientific Excellence:</i> peer review, international standards of excellence, innovation and synergy</p> <p><i>Collaboration:</i> collaboration with organizations, scientists, philanthropists and charities, and the developing world, to advance knowledge</p> <p><i>Accountability:</i> fair and open decision-making with scope for public scrutiny</p> <p><i>Ethics:</i> ethical principles and processes to ensure excellence in research, application and good governance</p>	<p>To advance research and discovery in the biomedical sciences</p> <p>To encourage scientific collaboration between researchers and trainees in Canada and Israel</p> <p>To build capacity in biomedical science and foster scientific relations and collaborations with researchers and trainees in LMICs</p>	IDRC ⁷	<ul style="list-style-type: none"> • Providing researchers from LMICs with financial resources, advice, and training • Sharing knowledge with policymakers, researchers, and communities around the world • Fostering new talent by offering fellowships and awards • Putting new knowledge into the hands of those who can use it best to address global challenges
		CIHR ⁸	<ul style="list-style-type: none"> • Focus on Canadian health research • Funding investigator-initiated research and research on targeted priority areas • Building research capacity in under-developed areas • Training the next generation of health researchers • Knowledge translation for new policies, practices, procedures, products and services
		ISF ⁹	<ul style="list-style-type: none"> • Promoting scientific excellence • Support basic research in Israel • Ensuring a high success rate of grant funding
		AF ¹⁰	<ul style="list-style-type: none"> • Improving the lives of present and future generations through education, research, healthcare and the arts, mainly in Canada and Israel • 8 thematic foci, including: Science, research and healthcare; neurodevelopment • Fellowships and awards for all postgraduate studies (all subjects) and a Neurodevelopment Research Program

N.B. Please note that individual principles or priorities are not being mapped or compared horizontally.

5.2 Demonstrable need for the Program

The JCIHRP funding beneficiaries (PIs, LMIC collaborators and trainees) interviewed unanimously agreed that the Program fills a gap in the research funding landscape and is relevant to their research needs. The majority of Canadian and Israeli PIs who were interviewed stated that their motivation for

⁶ ISF, CIHR and IDRC (2014) Memorandum of Understanding concerning the Joint Canada-Israel Health Research Program

⁷ <https://www.idrc.ca/en/what-we-do>

⁸ <http://www.cihr-irsc.gc.ca/e/7263.html>

⁹ <https://www.isf.org.il/#/isf-mission>

¹⁰ <https://azrielifoundation.org/about-us/our-mission/>

applying to the JCIHRP was to have the opportunity to collaborate on an international level. Two interviewees (one Israeli and one Canadian PI) also noted the inclusion of an LMIC collaborator as a motivating factor for applying to the program. No other programs currently fulfil this demand for basic research collaborations between Canada, Israel and LMICs.

One PI noted that it is relatively common for collaboration grants to only fund aspects that facilitate collaboration i.e. travel to meetings and exchange of personnel between labs, and not the research itself. However, the JCIHRP fills this gap by providing adequate funding for both the facilitating aspects as well as the main body of work. For many LMIC collaborators, the JCIHRP funding has provided the opportunity to be included in much larger studies and to create partnerships with researchers in Canada and Israel that would not otherwise have been possible. An adjudication panel member highlighted that often health research in LMICs is aimed at topics such as infectious diseases and health system development rather than basic research.

Thus, there appears to be a demonstrable need for the Program in the countries targeted. Moreover, it is an important source of funding for basic health research and international collaboration in Canada, Israel and LMICs.

5.3 Suitability of JCIHRP's design to meet its objectives

The JCIHRP has been designed to meet the mandates of all of the funding partners. The structure has evolved somewhat over time. While there were some minor issues at that beginning of the Program, they have now been fine tuned¹¹.

The Program combines traditional features of international research programs with the additional element of the LMIC component. It uses international peer review to assess applications, funding the highest-ranked proposals, and thus project teams with a high level of scientific excellence in terms of the scientific merit of the planned research, experience and achievement of the applicants, collaboration plan, and research environment and infrastructure. High quality expertise in the project teams makes it more likely that the JCIHRP projects will produce path-breaking scientific research, thus fulfilling the first objective of advancing biomedical research and discovery.

Beneficiaries (i.e. JCIHRP-funded researchers) interviewed said that the program requirements by themselves encourage collaboration between Canada, Israel and LMICs and thus capacity building. Collaborative working is a facilitator of research and discovery. JCIHRP funding offers a unique opportunity for LMIC, Canadian and Israeli researchers including students to collaborate and benefit from each other's expertise and facilities, leading to development of technical and soft skills. Among the adjudication panel members interviewed, one believed that the program design fit the objectives very well. Another felt that the scientific objective was well served by the Program but the impact of interactions with LMIC researchers was unclear.

Overall, the Governance Committee members felt that both the program structure and governance model are suited to delivering the program objectives, the key enabler being the selection of the best proposals and teams for funding. Having all funders equally represented on both the governance and implementation ends has enabled real engagement and given all funders an equal voice regardless of their funding contribution. While the Program is mainly looking to fund basic research, funders (i.e. Governance Committee and Program Directors) view this as a stepping stone to technological innovation, another intended outcome from the Program (see Figure 1). On the other hand, one Governance Committee member felt that the nature of LMIC participation needs further discussion and that greater integration of this component is needed.

The evaluators' view is that broadly the JCIHRP's structure seems suited to meeting the articulated objectives of the Programme. However, further clarity is needed in terms of the LMIC collaboration and capacity building elements and the outcomes expected from these. This is because LMIC collaboration is variable, ranging from workshops to individual trainees (usually in Canada) and more experienced

¹¹ Scoping interviews

researchers based in LMICs, and the scientific and LMIC research capacity building outcomes will probably differ accordingly.

5.4 Extent to which the Program is being implemented as designed

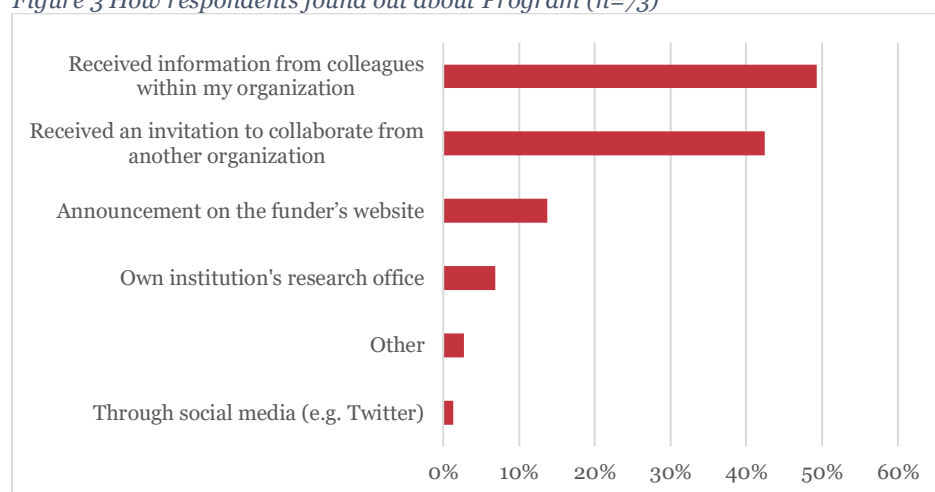
The implementation seems to be going very well with Program Directors reporting only minor issues which is to be expected in a collaboration involving four quite different funders. The group has managed to work out differences and find a system that works for everyone. Regular meetings (weekly or monthly as needed) through teleconferences have worked well. Stability in terms of the staff involved in the Program has led to strong relationships being built across the funders and has provided continuity in decision making and implementation. Program Directors find that a collegial atmosphere between the Program staff with good buy-in at the highest levels as well as the expertise and experience of those involved has meant that implementation has gone extremely smoothly. Key to this has been an effective governance model, CIHR's and ISF's support of the adjudication process and the capacity in IDRC to monitor and advise LMIC collaborators.

5.4.1 Funding opportunity development and application phase

The four funding partners work together to refine the call documents and the communication materials, with calls then being launched in the fall for the next year's Program. The administrative elements of the call process are led by the CIHR who have strong operational experience in this area. The call text is made available in English and French on the CIHR website and in Hebrew on the ISF website¹².

Nonetheless, in our survey, respondents mentioned that they found out about the Program mainly through colleagues within their own organization (49%, Figure 3) or an invitation to collaborate for this Program (42%) rather than an announcement on a funder's website (14%).

Figure 3 How respondents found out about Program (n=73)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5.

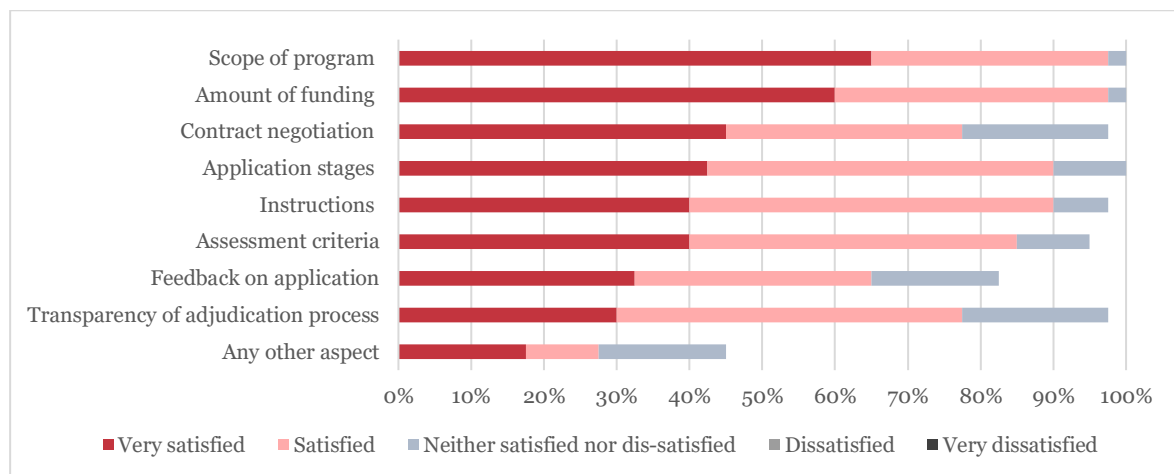
While the Program was originally designed to focus on neuroscience, the funding partners later agreed that focusing on other topics that are current and relevant to Canada, Israel and LMICs would be a beneficial change. Hence, the topics of the calls have changed annually (e.g. immunology, cancer and neurobiology in 2016, 2017 and 2018 respectively) since the JCIHRP began. As the program has evolved, Program Directors have taken a more active role in horizon scanning and creating a longlist of potentially relevant research areas for the Governance Committee to consider¹².

¹² Scoping interview

All four of the call texts^{13,14,15,16} reviewed explicitly stated the program objectives of supporting the search for ‘breakthroughs’ in biomedical and health sciences and integrating researchers from LMICs. The calls specify that the LMIC collaborator can be an individual who is an independent researcher, a knowledge user, and/or a trainee who will contribute to the planned activities of the grant. Activities supported include scientific workshops or summer schools benefiting researchers/trainees from eligible LMICs and the inclusion of trainees and/or established researchers from LMICs in the carrying out of research. What is required from the LMIC collaboration has been more explicit from the second call onwards^{15, 16}. That is, for the application to be eligible, applicants must include a plan for integrating and establishing long-term scientific relationships with LMIC researchers and include at least one activity (workshop, trainee, collaboration with established researcher) aimed at supporting capacity and scientific relationships with LMICs. This element was less clear in the 2015 call text.

In all instances, the IDRC is tasked with funding the Canadian PI institution and the LMIC collaborator (up to a maximum of C\$670,000 [around NIS 1.87 million] per project over 3 years), while the ISF funds the Israeli PI institution (up to a maximum of NIS 1.54 million [around C\$552,000] per project over 3 years). However, the expected or maximum budget allocation for the LMIC component is not defined in the call text in order to allow individual teams to allocate resources according to their own requirements. Lack of clarity at the proposal stage of how LMICs were expected to be integrated in a project was remarked on by two Canadian PIs.

Figure 4 Extent of satisfaction of PIs with various aspects of the application process (n=40)



Source: Technopolis analysis of responses from all Canadian and Israeli PIs (Calls 1 to 4). Distribution of respondents by call can be found in Table 5.

Figure 4 above shows that at least 60% of Canadian and Israeli PIs were very satisfied with the scope of the Program and the amount of funding on offer. Overall, all the PIs were satisfied or very satisfied with the different aspects of the application process we asked them about. However, fewer people were satisfied with feedback on their application with 20% of the PIs deciding not to answer the question at all. Among other aspects that PIs commented on were the application interface (n=4), confusion around the budget instructions (n=2) and positive interaction with IDRC (n=2). The four individuals who commented on the application interface found it cumbersome and time-consuming. In particular, three Israeli PIs mentioned that they found the CV formatting too detailed and time-consuming. In interviews,

¹³ JCIHRP 2017 call text. Available at: <https://www.researchnet-recherchenet.ca/>

¹⁴ JCIHRP 2018 call text. Available at: <https://www.researchnet-recherchenet.ca/>

¹⁵ JCIHRP 2016 call text. Available at: <https://www.researchnet-recherchenet.ca/>

¹⁶ JCIHRP 2015 call text. Available at: <https://www.researchnet-recherchenet.ca/>

three PIs noted that they obtained support from their institution's administrative team when developing their proposals, which was standard practice for them.

5.4.2 *The adjudication process*

The review of grant applications for JCIHRP funding is undertaken in accordance with funder-agreed criteria and processes which incorporate elements from both the Canadian and Israeli research systems¹⁷. An adjudication guide has been produced which outlines guidance regarding managing conflicts of interest, the role and function of the adjudication panel, the application evaluation criteria, the sequence of steps to be undertaken during the panel review process, and measures to be taken in order to ensure confidentiality¹⁸.

The adjudication panel reviews grant applications for each call of the JCIHRP. Panel members are appointed based on their academic achievement and the knowledge and experience they can bring to the review process. As such, a new panel is appointed for each annual theme, predominantly comprising international reviewers and at least one Canadian and Israeli researcher each¹⁷. The panel includes a Chair and a Scientific Officer (usually a Canadian researcher¹⁷) who ensures that an accurate record of panel discussions on each application including discussions on potential ethical issues or budgetary adjustments is maintained. Staff members from the funding agencies are also present to keep track of strategic considerations, recommendations, ranking of applications as well as to ask and answer any questions.

Up to a maximum of 6 applications per call are funded by the JCIHRP. Judgements regarding whether or not a proposal is appropriate for funding are based on four main criteria¹⁹:

- Scientific merit
- Experience and achievements of the applicants
- Collaboration within the project
- Environment and infrastructure for research

Each application is independently reviewed by two panel members, a primary and secondary reviewer. In certain cases, a third reviewer or reader will also evaluate the application. To ensure a consistent approach, all reviewers from Call 2 onwards have adhered to a common rating scale ranging from 0-4.9. Call 1 used an NIH (US National Institutes of Health) scale from 1 to 9 where 1 was the highest and 9 was the lowest. Only applications with a score of 3.5 or higher are eligible for funding. In addition, reviewers are required to assign each application to one of three categories ('binning' process):

A – Should be funded

B – Recommended for funding if budget permits

C – Not recommended for funding

Applications and their ratings are discussed confidentially in a face-to-face panel meeting. At the beginning of the review process, a sample of proposals from each 'bin' (A, B and C) is read to establish what reviewers understand as excellent as well as fundable and unfundable proposals. Usually an application rated 'A' by at least one reviewer will definitely be discussed²⁰. An application assigned to Category C by both reviewers during the binning process is not discussed unless another panel member requests a discussion. In some years applications rated 'B' by both researchers have also been discussed.

¹⁷ Scoping interview

¹⁸ 2017 Adjudication Panel Manual for the Joint Canada-Israel Health Research Program

¹⁹ JCIHRP 2018 call text. Available at: <https://www.researchnet-recherchenet.ca/>

²⁰ Scoping interview

Members are responsible for declaring any potential conflicts of interest related to an application and must withdraw from the meeting room when the application in question is being discussed²¹.

Once all the applications have been discussed, the Governance Committee is presented with the final rank order of applications and has the opportunity to reopen certain applications for discussion, until the committee is satisfied that the final rank order appropriately reflects the discussion. The Governance Committee has generally followed the ranking of the adjudication panel so far²². There have been at least two instances where the seventh ranked proposal has been funded – one where the Canadian applicant of a higher ranked proposal had left the country and another where a proposed clinical trial was considered to be unfeasible based on external review²¹.

The majority of PIs interviewed could not comment on this aspect of the Program other than in a few cases where they had received useful feedback from the adjudication panel.

The adjudication panel chairs we spoke to felt that in general the composition and quality of expertise in the adjudication panels was good, and that the assessment criteria and process were true to the Program's objectives and met international standards. They also appreciated support from the funders in tackling administrative issues and queries as well as preventing discussions from going in the wrong direction in panel meetings. In addition, they mentioned that the discussions were appropriate and of a high standard. One panel chair commented that the website for gaining access to the applications was "very glitchy" and that the security measures were overburdensome, going over and above any security requirements he had experienced on other review panels.

The majority of chairs felt that gender and career stage balance within the panels was achieved. One chair noted that there were a number of less experienced international reviewers on his panel and attributed this to the emphasis placed on the LMIC component. This individual questioned whether the inclusion of LMIC panellists was necessary as in addition to less adjudication experience, convening the review panels became more challenging logistically owing to travel requirements. However, the Program Directors felt it was more appropriate to prioritize LMIC representation within the review panels.

Two adjudication panel members noted that in their experience, LMIC involvement was a criterion that was taken very seriously when evaluating proposals. In these cases, the panels endeavoured to promote grants that included genuine involvement with capacity building and demoted those which did not convince them of sincere intent. Thus, it appears that the adjudication criteria and process are appropriate for the selection of projects of high scientific quality and genuine LMIC involvement.

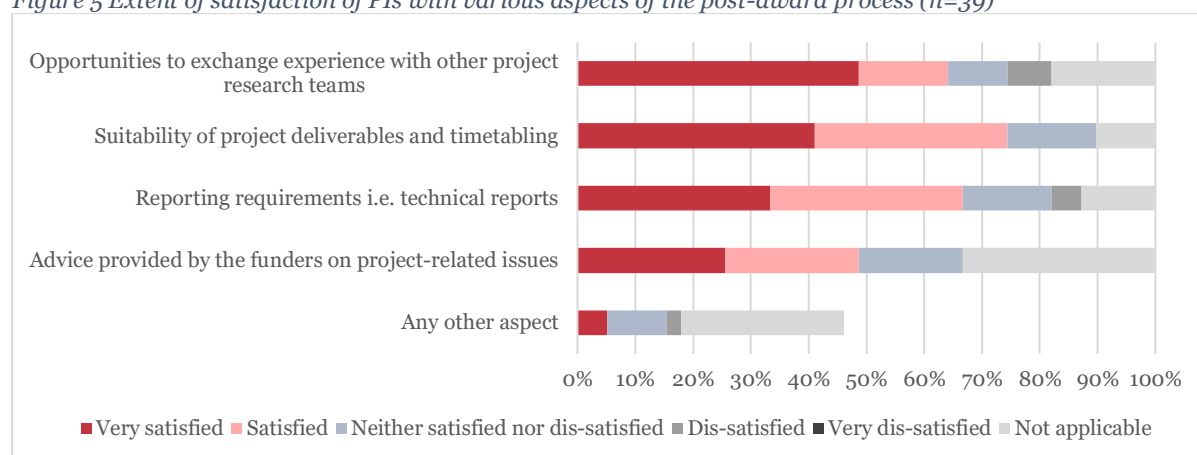
5.4.3 *Research phase*

A number of beneficiaries highlighted in interviews that the interaction with the funders (particularly IDRC) was extremely professional and personable, with prompt responses to any questions or clarifications they required. Additionally, survey responses indicated that Canadian and Israeli PIs were largely satisfied with post-award processes (at least 49% of respondents were satisfied or very satisfied with the post-award aspects highlighted, Figure 5). Other aspects highlighted (by 2 respondents each) were problems with LMIC collaborators, problems with transferring funds to LMICs and a high level of satisfaction with support and guidance from IDRC.

²¹ Scoping interview

²² Scoping and Governance Committee interviews

Figure 5 Extent of satisfaction of PIs with various aspects of the post-award process (n=39)



Source: Technopolis analysis of responses from all Canadian and Israeli PIs (Calls 1 to 4). Distribution of respondents by call can be found in Table 5. One Canadian PI from Call 4 did not respond to this question.

Indeed, problems with LMIC collaborators not being engaged or available, and problems with accessing the grant funds in LMICs because of bureaucratic reasons were also highlighted as problems in interviews. Consequently, funders have been flexible with the LMIC component, adopting other mechanisms to fulfil requirements when projects reach an impasse. For example, in one instance, an LMIC MSc student was recruited instead of a postdoctoral fellow as originally planned, in another, a workshop was organized in Canada for LMIC participants when funds could not be transferred to the LMIC partner institution. One technical report (Call 1: Neuroscience) mentioned problems with shipping samples to an LMIC which led to valuable samples being destroyed, resulting in project delays. In that case, the project team agreed that the LMIC researchers would conduct parallel research in a specific area rather than working on the same experiments in conjunction with their Canadian and Israeli colleagues. Importantly, these experiences show the variety of ways in which the LMIC collaboration is being delivered – from workshops to LMIC students or postdoctoral fellows working in Canadian labs to established PIs in LMICs undertaking work in their own country.

5.4.4 Project reporting and monitoring phase

A single reporting mechanism is used for each collaborative project. This includes two technical reports (termed scientific report in Israel) per project; one mid-term report at 18 months and one final report at the end of the project. The IDRC also conducts site visits to both components funded by Canada – to the Canadian institution 4 months before the mid-term report is due and to the LMIC institution after analysis of the mid-term report²³.

The IDRC completes these monitoring visits to assess project progress against the stated goals and objectives, discuss any issues relating to project implementation and research collaboration, advise on technical and administrative issues, review any financial aspects, and discuss next steps²³. The information collected from the site visits feeds into a self-assessment progress report to the Governance Committee.

Of the interviewees (JCIHRP-funded researchers) who had delivered mid-term or final reports, the majority agreed that the monitoring and reporting requirements were fair and not overly burdensome, with the appropriate aspects being monitored. One Canadian PI noted that the requirements for the mid-term report were very comprehensive and more rigorous than those required from other grants. Several beneficiaries (including one PI and all LMIC collaborators) also felt that the Program Directors engaged with the project team in a meaningful way and were genuinely interested in knowing the extent to which LMIC collaborators were involved in the research.

²³ Santos, F. (2018) Joint Canada-Israel Health Research Program Progress Report (2015-2017)

The LMIC interviewees in particular were very appreciative of the monitoring visit from the IDRC and felt that it enabled them to participate in their project in a more meaningful way. They liked that the IDRC staff were interested in hearing how the project team interacted and how decisions were made, while also helping participants to rectify any project-related issues.

6 Effectiveness and performance

6.1 Funded projects

The Program has supported 24 research teams across the first four calls, covering neurosciences (2015), immunology (2016), cancer (2017) and neurobiology (2018). The 2019 call focuses on ‘Metabolism in Health and Disease’, encompassing a diverse range of potential sub-topics including metabolomics; inflammation; epigenetics; hormonal regulation and infectious diseases²⁴.

An assessment of project titles by the evaluation team suggests that the funded projects are well aligned with the research areas specified in the call texts. A diverse range of countries and institutions are involved in the collaborations (see Figure 6). Interestingly, the majority of these countries are upper middle-income economies according to World Bank Classification²⁵. Only India, Kenya and Nepal are lower middle- or low-income countries. Outside Canada and Israel, India has the most projects, while McGill University in Canada and the Weizmann Institute of Science in Israel are involved in at least one-third of the projects across all calls.

Document review by the evaluation team identified 37 named LMIC collaborators (PIs, postdoctoral fellows, students) across the 24 projects²⁶, of whom 51% are female. This is a much greater proportion compared to the percentage of women among the Canadian and Israeli PIs (21% and 13% respectively), which is probably a reflection of an existing gender imbalance in senior research positions in both these countries.

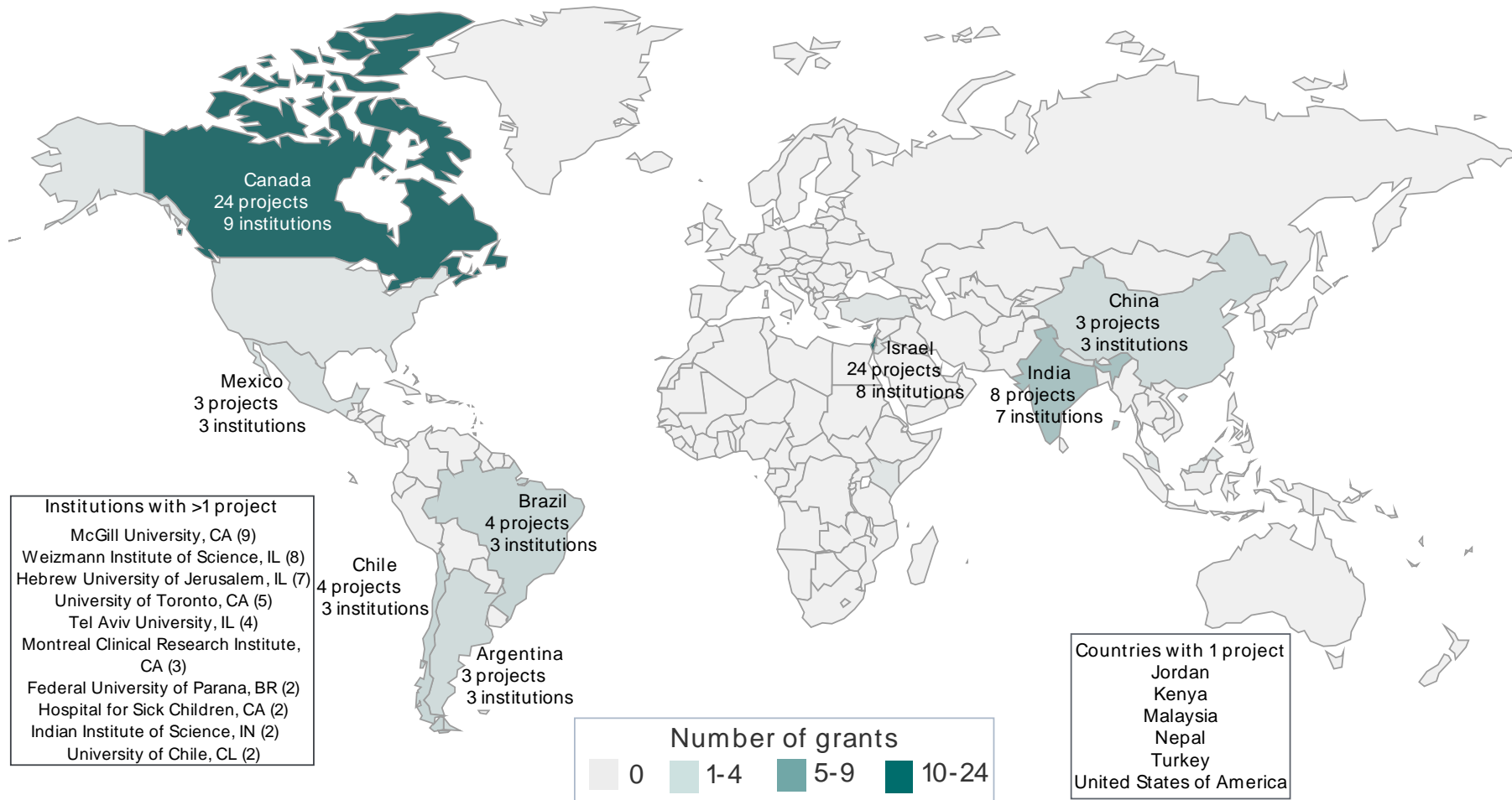
The distribution of projects in partner countries (other than Canada or Israel) and institutions for each call may indicate strength in particular research areas (see Figure 7). For instance, India is a partner on three out of the six projects funded in Neuroscience (Call 1) and Immunology (Call 2), while Brazil is included in three out of the six project consortia for Cancer (Call 3). Similarly, McGill University is involved in three projects each from the Neuroscience and Neurobiology calls, the Weizmann Institute of Science has three projects each in Immunology and Cancer, while the Hebrew University of Jerusalem is a partner on four out of the six Neurobiology projects. This success in winning multiple projects under specific calls potentially indicates strong research track and leadership within these institutions in research areas relevant to the call.

²⁴ 2018 Governance Committee documentation

²⁵ <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

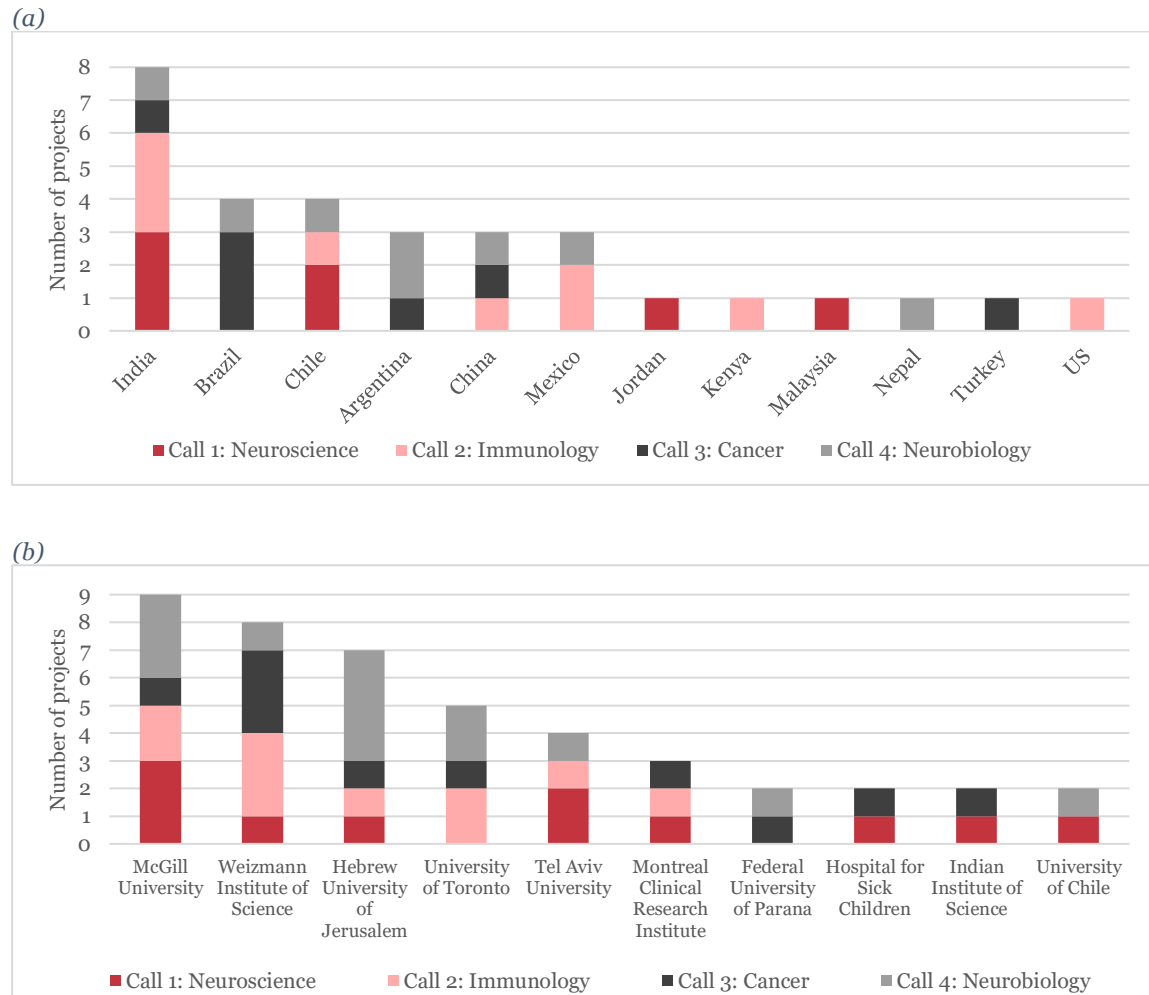
²⁶ JCIHRP project abstracts supplied by IDRC

Figure 6 Distribution of JCIHRP projects (Calls 1 to 4)



N.B. Where known, research institutes or centres have been counted under their main University affiliation.

Figure 7 Distribution of projects by call in (a) JCIHRP partner countries (excluding Canada and Israel) and (b) in institutions with more than one project

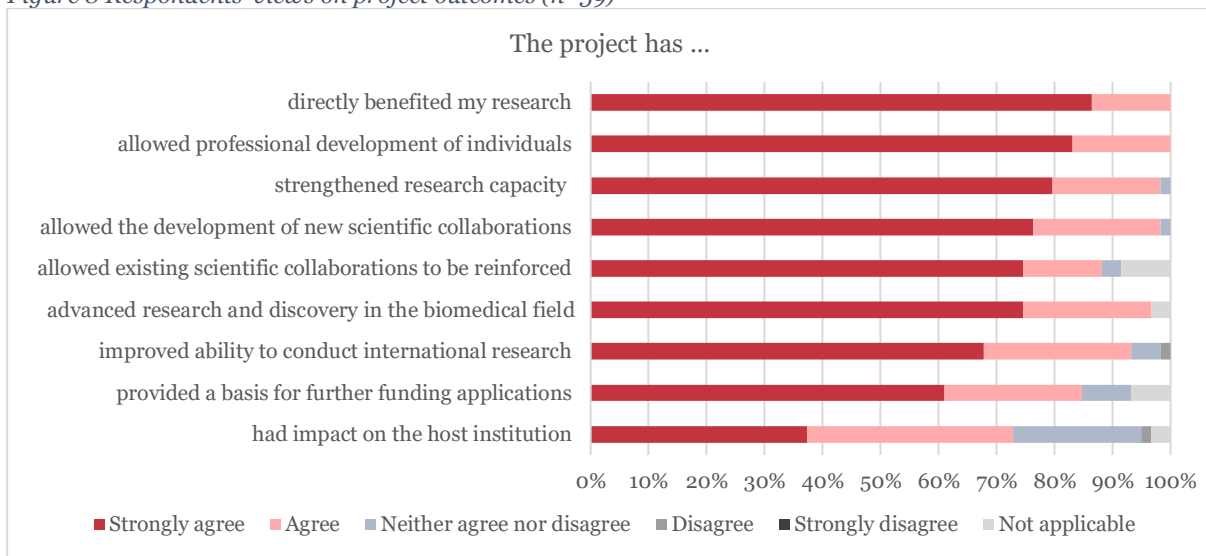


6.2 Extent to which expected project outcomes are being achieved

Our survey analysis (Figure 8) shows that just over half of the respondents from Calls 1 to 3²⁷ strongly agree (at least 60% of respondents) that their projects have met expected outcomes (see JCIHRP’s theory of change, Figure 1) such as advancing biomedical research and discovery, strengthened research capacity, development and strengthening of collaborations and professional development of individuals. However, impact on the host institution i.e. organizational capacity building outside the direct project team has been achieved to a much lesser extent. These findings were confirmed by JCIHRP beneficiary interviews.

²⁷ We disregarded the responses of respondents from Call 4 as their projects have just started.

Figure 8 Respondents' views on project outcomes (n=59)



Source: Technopolis analysis of responses from all Call 1 to 3 survey respondents. Distribution of respondents by call, role and geography can be found in Table 5.

6.2.1 Advanced research and discovery

While some beneficiaries we spoke to felt that it was too early in their project to make claims regarding scientific advancement, those who are in the later stages of their research broadly agreed that their JCIHRP-funded project had enabled advanced research and discovery in the biomedical field.

Most projects are concentrating on fundamental discovery science. In these instances, beneficiaries reported advancements such as improved understanding of the biological pathways and underlying mechanisms of disease, development of novel research techniques and development of animal models of disease. While the outcomes of these projects may not be directly applicable within an applied setting, the interviewees agreed that where positive results were obtained, there was potential for progression towards more translational impact. This is in line with the Program's theory of change (Figure 1) where basic research is expected to also lead to technological innovation related to animal and human health. However, in a majority of cases this may not be a direct outcome of the JCIHRP-funded project itself.

Some projects sit at the interface between basic and translational research, for example, projects looking to elucidate potential therapeutic targets for drug development (see Case study 1 below). One PI noted that this was a particularly exciting position to be in, which provided opportunities for innovation. Another project has led to a change in the treatment of children with a rare type of brain cancer. This particular work also led to publications in high-impact journals. A further example involved bringing a commercial partner onboard at the outset of the project, allowing the team to undertake a proof-of-concept study related to rehabilitation following spastic hemiparesis. Although the results of this work are currently unknown (blinded randomized controlled trial), it is hoped that they will lead to new rehabilitation methods.

Case study 1: Advancing biomedical research and discovery in Parkinson's disease

A research team, which includes researchers from Canada, Israel, Chile and China, has been investigating the mechanisms underlying neurodegenerative disease, specifically how mitochondrial dysfunction contributes to the progression of Parkinson's disease (Immunology call). The team has identified a number of proteins which may be suitable therapeutic targets for developing treatment for the disease. The team is currently developing *in vitro* models to help identify potential lead compounds.

Pivotal to this early success is the complementary knowledge and skill set that each contributing partner has brought to the team. In particular, the clinical insight, experience and access to patient samples provided by the Canadian PI was extremely valuable. The core team is planning to continue the collaboration and has made efforts to obtain further funding and bring a commercial partner on board to expedite progress towards clinical impact.

6.2.2 Capacity building in LMICs

Two PIs, one each from Canada and Israel, found it difficult to predict the extent to which capacity building in LMICs would be achieved considering they were at a very early stage in their projects. However, in both instances the PIs noted that the LMIC collaborators were involved in the project design and application process, also stating that the LMIC collaborators are likely to be exposed to new research techniques and will eventually appear as co-authors on any project-related publications.

The LMIC collaborators interviewed stated that their involvement within the funded projects allowed them to develop new technical skills in addition to providing access to equipment and reagents not held within their own institutions. Furthermore, the funding facilitated training of individuals at MSc, PhD and postdoctoral level and allowed a number of these individuals to travel to laboratories in Canada and Israel, exposing them to different research environments. In all instances, the LMIC collaborators agreed that the opportunity allowed them to improve their ability to conduct international research and through this exposure they have been able to expand their professional networks, creating the potential for further collaborations.

Infrastructural development within LMIC institutions as a result of JCIHRP involvement was less evident. Some of the interviewees were concerned that JCIHRP funding was in many cases going to well-established institutions in more research-intensive LMICs rather than institutions with weaker research infrastructure. This point was reinforced by an LMIC-based interviewee who noted that although the JCIHRP funding was useful, their institution already had good infrastructure because of a significant degree of government funding and did not need capacity building in that sense.

An interesting example of LMIC capacity building was seen among the Call 1 (Neurosciences) projects. This project included several LMIC collaborators based in hospitals and involved research into a rare brain cancer in children. The project led to the establishment of a new network and significant capacity building in terms of ability to conduct research and paediatric clinical trials (see Case study 2 below).

Case study 2: Network and capacity building in LMICs in the area of cancer research

In a JCIHRP-funded project, a Canadian and Israeli PI set out to explore biallelic mismatch repair deficiency (bMMRD) tumour dynamics with a view to creating a stem cell line to test novel therapeutics. To this end, they organised an inaugural bMMRD workshop in Toronto with attendees from 45 countries, including LMICs. This event culminated in the creation of a governance committee, consisting of key researchers from LMICs, including the JCIHRP project partners from the Middle East and South East Asia. This professional network now makes key contributions to the International bMMRD Consortium which brings together international paediatric and adult gastroenterologists, oncologists and researchers who investigate the causes of bMMRD, and develop new treatments for children and young people with bMMRD cancers. Participation within the consortium has allowed LMIC researchers and clinicians to access modern molecular analysis methods, expert advice regarding clinical management, as well as low cost drug treatment in some cases. It has also enabled LMIC partners to build capacity towards conducting their own independent research and data collection with mentorship from the consortium. In addition, it opened the door for LMICs to participate in international paediatric clinical trials of bMMRD brain cancer treatments. Finally, the project has also facilitated routine collection of tissues and cell lines from bMMRD individuals in LMICs which has increased the pool of data available globally, allowing researchers and clinicians to gain a more detailed view of bMMRD brain tumour genomes.

The evaluators' view is that while numerous examples of personal development have been reported by LMIC beneficiaries, there is less evidence of capacity building at the institutional level, or indeed outside the direct project team. While the impact at the level of individual researchers should not be under-

valued, the desired outcome of organizational capacity building in LMICs is probably not going to be a significant direct outcome of the JCIHRP. It should be noted however that while organizational capacity building is highlighted as an expected outcome in the theory of change, it is not explicitly emphasized in the funding opportunity or adjudication process. Thus, it seems to be a lower priority outcome of the Program.

6.2.3 *Experience of collaboration*

The majority of interviewees agreed that their experience of collaborating within the JCIHRP was very positive. Researchers have been able to share data, exchange ideas, build knowledge and in some cases gain access to equipment and infrastructure they would not have otherwise (see Case study 3 below). In all instances where interviewees had the opportunity to travel to collaborating laboratories (6 out of 11 beneficiary interviewees), it had been a highly valuable experience. Working in a partner's laboratory was seen to be especially valuable for students and trainees who are thus able to experience different research environments and learn new research techniques. Most of the projects we encountered involved weekly/monthly online meetings with the wider research team to discuss progress. Four JCIHRP-funded interviewees also stated that the funding and subsequent exposure had allowed them to extend their professional networks and create new collaborations that otherwise might not have been possible.

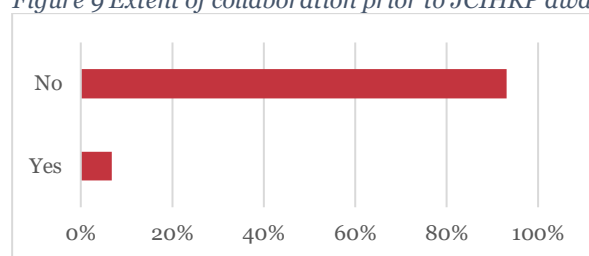
Case study 3: Collaborative research into stem cell-mediated host immunity

JCIHRP funding has enabled a team of researchers from Canada, Israel and Mexico to conduct collaborative research in the area of stem cell-mediated host immunity (Immunology call). In particular, the team is looking at regulation by the sphingolipid pathway, which has potential implications in the areas of infection, aging and the circadian rhythm. The project has brought together complementary expertise in xenotransplantation of human haematopoietic stem cells (Canada), a mouse model and day and night cues (Israel) and the haematopoietic microenvironment (Mexico). This is the first time the team has worked on a joint research project, which has been facilitated by focusing on specific objectives in a collaborative environment. As a result, the Mexican researchers have learnt xenotransplant and imaging mass cytometry techniques that they do not have in their institution. The Mexican collaborator is now based in the Canadian partner's lab, enabling knowledge exchange as well as expansion of professional networks. Ultimately, the joint grant ensured that partners contributed their skills, techniques and scientific expertise to push the boundaries of scientific knowledge, which will be important for basic and translational science in the areas of aging and transplantation. The project has already led to a new project in aging and another one is in the pipeline.

Interestingly, research capacity and expertise as well as the potential to develop these were found across the research teams irrespective of whether they were in LMICs, Canada or Israel. Two Canadian PIs noted that the JCIHRP had given them their first experience of collaborating on a large international grant, which had contributed greatly to their professional development. On the other hand, an Israeli PI highlighted a suboptimal collaboration with one of his LMIC partners. The PI in question believed this was because the LMIC researcher was a senior scientist based at a very well-funded institution with good infrastructure and thus had little to gain from the capacity building point of view.

Beneficiary survey analysis indicated that most (93%) respondents had not collaborated with their JCIHRP project partners previously (Figure 9). Thus, a vast majority of the projects represent new partnerships, showing that the Program is succeeding in its objective of encouraging scientific collaboration.

Figure 9 Extent of collaboration prior to JCIHRP award (n=73)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5.

6.3 Effectiveness of the adjudication process

There was agreement that the adjudication criteria and process enabled the Program to meet its objectives and allowed the selection of the highest quality proposals, with chairs confirming that the criteria and processes were comparable to international standards. A typical process involved circulation of the adjudication manual, a webinar to discuss the review process, a teleconference with the chair, and a preparatory meeting with the chair in advance of the meeting. Nevertheless, from a practical point of view, one panel chair felt that there was no clear structure for the meetings with no clear guidance to adhere to, which made the process slightly more challenging to navigate. However, the chair in question drew on previous experience in review panels, and felt that ultimately this did not impact the panel’s ability to select the highest quality proposals.

The study team analyzed the scores awarded to applications that were discussed at the panel meetings for the four calls (Table 2). These applications had already passed through the ‘binning’ process (see Section 5.4.2) and hence the scores do not represent the overall quality of all applications received. Call 1 used an NIH scale from 1 to 9 where 1 was the highest and 9 was the lowest. Calls 2 to 4 have used the CIHR scale from 0 to 4.9 as described in Section 5.4.2. It is important to note that scores cannot be compared across calls as the composition of each adjudication panel is different, and applications are scored and ranked in comparison to others within the same call. Besides, the ranking order is decided by consensus following discussions and iterations, and hence may vary from the order of the scores. In other words, the top-scoring six proposals may not always be the top-ranked six proposals. Therefore, adjudication scores (Table 2) have been analysed considering each call individually.

Table 2 Scores of funded and unfunded applications discussed at the adjudication panel meetings by call

	Call 1: Neurosciences [^]			Call 2: Immunology [*]			Call 3: Cancer [*]			Call 4: Neurobiology		
	Overall	Funded	Unfunded	Overall	Funded	Unfunded	Overall	Funded	Unfunded	Overall	Funded	Unfunded
No. of applications received	64			52			56			45		
No. of applications discussed by panel	26	6	20	29	6	23	17	6	11	28	6	22
Highest and lowest quality scores	1.18-6.64	1.18-2.63	3.00-6.64	4.81-3.07	4.81-4.28	4.11-3.07	4.48-3.26	4.48-4.15	4.18-3.28§	4.50-3.41	4.50-4.24	4.18-3.41
Mean score	4.17	1.97	4.83	3.75	4.44	3.57	4.08	4.35	3.93	3.95	4.36	3.84
Median score	3.78	2.05	4.82	3.65	4.39	3.60	4.07	4.41	3.92	3.97	4.32	3.80

[^]NIH scale used with 1 being the highest score and 9 being the lowest score

^{*}one top 6 application not funded – In one call, the Canadian applicant had left the country, and in the other the proposed clinical trial was considered unfeasible based on external review

§ an application with the original score of 4.18 was ranked lower by the panel than one that scored 4.15 during the final review of the ranking order to select the top 6 applications

The results show that the Program has consistently received a good number of very high-quality applications and that the funded projects have consistently received scores very close to the highest possible mark. Moreover, the descriptive statistics for unfunded applications shows that their quality is not far off that of the funded applications.

In keeping with this observation, adjudication panel chairs felt that the general quality of proposals was fair to good. One chair commented that the proposals were representative of the work going on in Canada and Israel, but another felt that the applications received were not as good as the best NIH proposals. The panel chairs also observed that some top Canadian and Israeli researchers as well as emerging researchers were applying to the Program. However, one panel chair expressed some doubt as to whether failure to find a truly meaningful LMIC collaboration might have kept some excellent researchers from applying.

Members of the Governance Committee agreed that they were keen to learn from each new call and made efforts to improve their processes and adjust the call texts if deficiencies were found. For example, the application criteria were changed slightly for the 2018 call (Neurobiology) following Governance Committee agreement that clinical trials should not be eligible for funding and that teams should be encouraged to integrate sex and gender perspectives into their research²⁸. In addition, requirements in terms of LMIC collaboration have been made more explicit from the second call onwards (see Section 5.4.1). Thus, the Program appears to be adapting to ensure the quality of applications and applicants.

6.4 Effectiveness of the Program's structure, governance and processes

The evaluation team's view is that while challenging, the integration of the four funders' mandates, systems and interests has been optimally managed to create a hierarchy of decision making and accountability as well as processes for working and implementation. Both Governance Committee members and Program Directors reported that the processes were working well and efficiently. Their view is that the governance and implementation processes are adequately resourced both in terms of people (expertise) and time (engagement). Regular communication between partners and decision making based on consensus ensures that any problems are addressed fairly and effectively. The current system seems to be working for everyone.

The highest-ranking proposals as assessed by high-calibre international scientists on the basis of scientific merit, experience and achievement of the applicants, collaboration plan, and research environment and infrastructure are funded, which means that the quality of projects is very high²⁹. In addition, the amount of funding available is substantial, especially compared to usual grant amounts in Israel, which further attracts high profile scientists to the Program³⁰.

Overall, the expected project outcomes appear to be emerging indicating that the program's structure, governance and processes are effective. In both the survey and the interviews, beneficiaries were complimentary about application and post-award processes, including reporting and monitoring (Section 5.4). The LMIC interviewees in particular were very appreciative of the monitoring visit from the IDRC and felt that it enabled them to participate in their project a more meaningful way.

When probed, stakeholders did not suggest major changes to the program structure and processes in interviews and were generally positive about the program's performance, further indicating the effectiveness of the program.

²⁸ JCIHRP 2018 call text. Available at: <https://www.researchnet-recherchenet.ca/>

²⁹ Based on a review of adjudication panel scores

³⁰ Stakeholder interviews

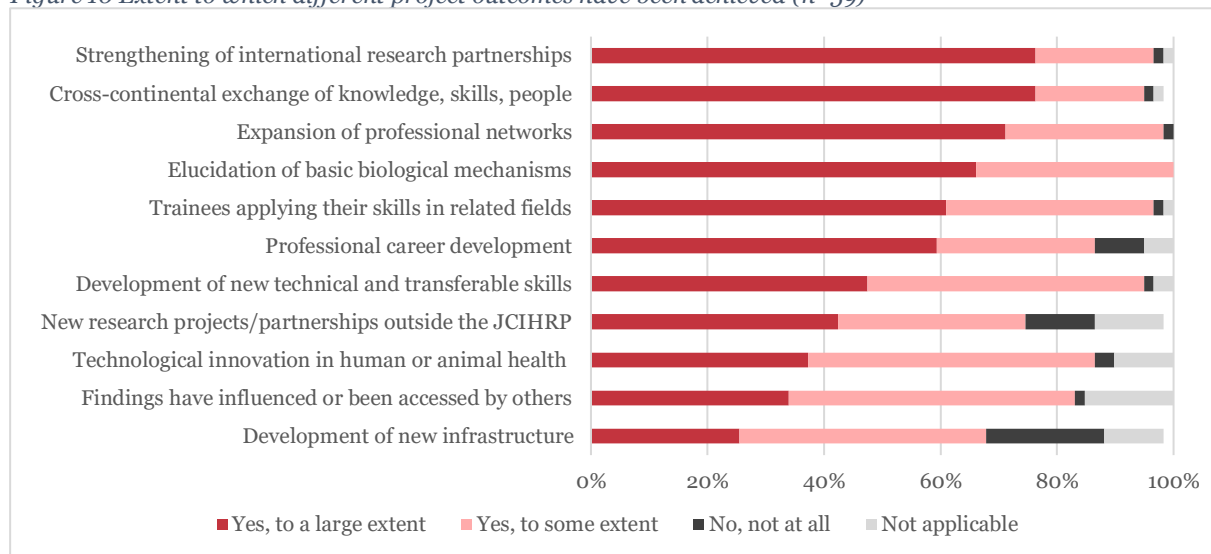
7 Emerging results

7.1 Outcomes and outputs achieved

Interviews and analysis of survey responses of JCIHRP funding beneficiaries from Calls 1 to 3 (we excluded Call 4 projects as they have only recently started) indicate that the expected outputs and outcomes highlighted in the theory of change (Figure 1) are being delivered already to some extent. Interviewees highlighted strong advances in scientific knowledge, development of technical skills and better knowledge of how to collaborate internationally as some of the main outcomes. Beneficiaries interviewed were particularly enthused about the potential of their research findings to impact on understanding of molecular mechanisms, clinical practice and technological innovation. Many felt that the high-quality of scientific knowledge created or being created in their projects was down to the nature of the collaborations enabled by the JCIHRP funding.

Over 50% of survey respondents (Figure 10) reported that strengthening of international research partnerships; cross-continental exchange of knowledge, skills and people; expansion of professional networks and career development; development of trainees’ skills and elucidation of basic biological mechanisms had been achieved to a large extent. Importantly, at least 67% of respondents said that all expected outcomes had been delivered to some extent. One-fifth of the survey respondents (20%) did not see any development of new infrastructure and the beneficiaries interviewed did not see major institutional impacts from the funding.

Figure 10 Extent to which different project outcomes have been achieved (n=59)



Source: Technopolis analysis of responses from all Call 1 to 3 survey respondents. Distribution of respondents by call, role and geography can be found in Table 5.

Table 3 shows the quantification of different outputs as reported by the survey respondents for Calls 1 to 3. As expected, respondents from Call 3 (2017) reported the fewest outputs, followed by those from Calls 2 (2016) and 1 (2015), in that order, reflecting the project durations. The numbers of outputs should be interpreted with caution because of self-reporting by respondents who may have under- or over-estimated their outputs or indeed misunderstood the question. Moreover, there may be some double counting in our analysis, for instance, in the case of the total number of publications and conference abstracts, because multiple respondents for a single project may be reporting the same output. To avoid possible double counting of jointly produced outputs, when reporting numbers per project, we have only used the highest number of the relevant output reported by one project participant. This approach assumes that the largest number will include all individually and jointly produced

outputs, and thus provides a conservative estimate, meaning that actual output numbers could be higher.

An alternative way to describe the emergence of outputs is to state the number of respondents who cite at least one of a particular output type. For example, 49% of respondents report at least one research paper and 64% have delivered at least one conference abstract or presentation. Interestingly, although 31% of the survey respondents are from LMICs, only about a fifth of these cite at least one research paper.

In addition, we see evidence of collaboration and knowledge exchange with over 50% of respondents stating that they visited their partners' labs and gave a seminar or talk there. Canadian and Israeli PIs and LMIC collaborators (excluding students and postdoctoral researchers) supervised on average 3.6 MSc/PhD students and 2.4 postdoctoral fellows each with women forming about 60% of these trainees. Moreover, on average 2.7 LMIC researchers are being supervised and trained by each PI or LMIC collaborator.

There is also evidence of new collaborations emerging from the JCIHRP projects either with the JCIHRP academic partners (at least one for 78% of projects) or non-academic partners (at least one for 56% of projects). The latter may indicate translational research emerging from the JCIHRP. Technological innovation is also occurring with six patent applications reported as being granted or filed as well as other outputs such as protocols, technical notes and clinical trials. 56% of projects mentioned at least one such output.

The six patents were reported across five projects from Call 1 (Neuroscience, two patents from two projects) and Call 2 (Immunology, four patents from three projects). Each patent was reported by either a Canadian or Israeli PI, but never by both suggesting that these may not be joint patents. One patent (Call 2: Immunology) was reported to be in the process of being filed. On searching for patents³¹ by the relevant PIs (those who reported the patents), we only found patents fitting the topics and timelines of the two Neuroscience projects. Both of these projects have submitted technical reports, neither of which mention any patents. Thus, attribution of the reported patent activity to the JCIHRP is questionable. It is unclear to what extent JCIHRP project findings have contributed to a patent, even one that fits the topic and timeline of a JCIHRP-funded project. For example, the patent in question could be based on previous findings or only partially on JCIHRP project findings.

Survey respondents were generally more generous with estimating the number of planned outputs i.e. outputs they plan to produce during the remainder of their project. These data can be found in Table 6 in Appendix G.

³¹ Records searched on the lens.org website, a platform providing access to global patent information

Table 3 Quantification of actual project outputs based on survey responses (Calls 1 to 3 only)

	% of respondents /projects citing at least one of this output	Total number of output	Average (based on n)	Maximum individual value reported
Number of research papers per project ³² (n=18)	94%	37	2.1	8
Number of research papers per respondent (n=59)	49%	60	1.0	8
Number of research papers per LMIC respondent (n=18)	22%	8	0.4	3
Number of conference or meeting abstracts and presentations per respondent (n=59)	64%	209	3.5	30
Number of knowledge exchange events attended per respondent (n=59)	71%	227	3.8	30
Number of research visits made to partners' labs per respondent (n=59)	54%	73	1.2	12
Number of seminars/talks given at partners' institutions per respondent	53%	78	1.3	21
Number of awards and prizes per respondent (n=59)	20%	34	0.6	8
Number of MSc and PhD students per PI/LMIC collaborator ³³ (n=43)	64%	136	3.6	10
Number of postdoctoral researchers per PI/LMIC collaborator ³³ (n=43)	59%	85	2.4	5
Number of women trainees (students and postdocs) per PI/LMIC collaborator ³³ (n=43)	68%	143	3.6	9
Number of LMIC researchers (including students) per PI/LMIC collaborator ³³ (n=43)	44%	70.5	2.7	16
Number of new projects (not funded by the JCIHRP) with academic collaborators or institutions involved in the JCIHRP project per project ³² (n=18)	78%	24	1.3	3
Number of new projects/partnerships with non-academic partners as a result of the JCIHRP project per project ³² (n=18)	56%	22	1.2	11
Number of other outputs eg technical notes, protocols and patents per project ³² (n=18)	56%	29	1.6	9

7.2 Unintended outcomes

In the stakeholder interviews, beneficiaries (4 of 11) cited the emergence of new projects and funding applications either with partners they have worked with in the JCIHRP projects or others as the main unexpected by-product of the JCIHRP. For instance, one Canadian PI remarked that he was using the experience gained from his JCIHRP project (his first international collaboration) to collaborate with other international partners e.g. in Germany and elsewhere. In another instance, an LMIC collaborator has been invited to sit on a global panel of policy making bodies representing LMICs within his area of research owing to the exposure he achieved as a result of the JCIHRP collaboration. Other examples of unintended outcomes include development of paediatric clinical trial capacity in LMIC partner

³² To avoid double counting the same output, we used the highest number of that output type reported for a project by one respondent based on the assumption that most outputs will be jointly produced and the larger number will include all individual and joint outputs.

³³ Here, LMIC collaborators are defined as those that are PIs in their own right. Postdoctoral researchers or students from LMICs have been excluded from this analysis.

institutions (see Case study 2), colleagues asking for advice on applying to the JCIHRP and an invitation to be part of a conference panel.

The large number of South American collaborators in the JCIHRP portfolio was noted by one Governance Committee member as an unanticipated outcome.

8 Value and sustainability

8.1 Unique features of the JCIHRP and added value

A vast majority of beneficiaries surveyed felt that JCIHRP adds value above and beyond other funding opportunities (Figure 19). 36 out of 41 respondents who gave comments stated that they particularly valued the international collaboration aspect, from the perspective of facilitating collaborations between Canada, Israel and/or LMICs. Seven of the respondents felt that their collaborations and subsequent results would not have happened without the JCIHRP. Other aspects that individuals valued included the higher level of funding compared to what is normally available in Israel, unique program features not available in their own country, opportunity to establish new research networks and assessment by an international review panel.

These views were echoed in the beneficiary interviews with the majority of JCIHRP beneficiaries agreeing that the Program's mandate to create a collaborative international research team, including researchers from Canada, Israel and LMICs to pursue novel research at the frontiers of science was what made the Program unique. Many of the beneficiaries were aware of other binational research grants such as the United States–Israel Binational Science Foundation (BSF) and the German-Israeli Project Cooperation Program (DIP). However, most noted that the JCIHRP Program was the only funding opportunity specifically aimed at Canadian and Israeli researchers, with the additional objective of building research capacity in LMICs. Interestingly an Israeli PI felt that compared to the aforementioned binational research programs (BSF and DIP), the JCIHRP was 'less political', which was a quality he hoped would be maintained.

Several beneficiaries noted that the funding mechanism also allowed high calibre researchers from LMICs to provide complementary expertise to their counterparts in Canada and Israel, and create collaborations that may not have otherwise come to fruition. They also noted that compared to basic research grants within their own countries, the JCIHRP grants were very generous. This allowed teams to achieve more in the funded period than they may otherwise have been able to and was fundamental to the success of many projects. Interestingly, a Canadian PI noted that in North America, grants are often associated with budget restrictions, i.e. the funding will not cover visas, travel or tuition fees. Uniquely the flexible budget approach of the JCIHRP facilitates international travel allowing the exchange of students and trainees between labs, which helps to build stronger relationships.

One LMIC researcher commented that having call themes has the added value of creating networks and building capacity in the chosen areas. Several of the LMIC beneficiaries also noted the uniqueness of the monitoring visit from IDRC Program staff and the benefit this brought to the team. They appreciated this 'hands on' approach and the funders' concern with ensuring meaningful LMIC involvement in the project.

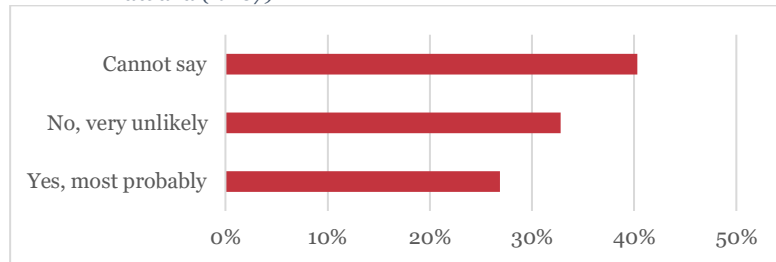
The Governance Committee members unanimously agreed that the integration of Canadian and Israeli researchers with LMIC collaborators was profoundly original and is a dimension that no other current program has. A Canadian Governance Committee member also felt that the Program had broadened debate within Canadian organizations on how best to couple discovery science with global challenges by demonstrating an alternative approach.

The project participants we interviewed were so positive about the added value of the JCIHRP that they would be happy to apply again should the funding opportunity fit their research expertise. Elements of the Program that impacted on this favorable view included a realistic budget on offer for impactful

research, diversity of collaborators and positive experience of collaboration in their current JCIHRP project.

PIs were extremely positive about applying for JCIHRP funding again (98% of PIs in the survey, see Figure 17) should the opportunity arise. However, only 33% of survey respondents overall felt that they would not have obtained alternative funding if they had failed to receive the JCIHRP award (Figure 11). About 27% of respondents felt that their project would have most probably been funded anyway and 40% were not sure.

Figure 11 Respondents' views on whether the current project would have been funded without the JCIHRP award (n=67)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5. One Canadian PI (Call 2), two trainees (Call 2) and three LMIC collaborators (two from Call 1 and one from Call 4) did not answer this question.

8.2 Sustainability of collaborations following the funded period

The majority of beneficiaries expressed that they would like to see the collaborations formed as a result of the JCIHRP funding to be sustained. In most cases, researchers highlighted that this would ultimately depend on availability of follow-on funding and the outcome of the current project. Several noted that it would be disappointing to lose momentum having invested considerable effort in establishing these new international collaborations and that in some instances, there was a translational aspect to the work that would be valuable to progress further. In addition, some interviewees noted that their research findings had created new scientific questions that they hoped to answer in the future.

Although a significant proportion of the beneficiaries have not yet reached a point in their research to assess the potential for further work, a number of the researchers funded in the early JCIHRP calls have already started new projects or are planning future collaborations. In most cases, these collaborations are related to the original JCIHRP project, but would be taking the research in a slightly different direction. Interestingly, one of the teams funded within the Immunology call (Call 2) has been able to submit a proposal to the JCIHRP call 'Metabolism in health and disease' (Call 5). For this team, it was serendipitous that their original project was related to both metabolism and immunology.

In the survey, researchers highlighted emerging program legacies that are not dependent on funding (Section 7.1). For instance, at least three-quarters of respondents indicated that their findings had been accessed by or influenced other researchers, new projects and partnerships had been launched outside the JCIHRP and trainees were applying their findings in new fields (Figure 10). Additionally, 44% and 17% of respondents respectively cited at least one new collaboration with JCIHRP academic partners or other non-academic partners emerging from their projects (Table 3).

An exemplar of sustained collaboration is a project funded within the Cancer call (Call 3). The project has been able to obtain further funding to the value of C\$16 million as a result of the original JCIHRP grant, with many future projects in the pipeline. Another project team (funded under the Neuroscience call [Call 1]) has managed to fund a clinical trial worth C\$8 million with a drug company and has also engaged with donors and charities from the US and LMICs.

8.3 Communication with key audiences

The interviewees agreed that the key audience for JCIHRP funding calls is academics conducting basic biomedical research. The Canadian and Israeli PIs interviewed became aware of the JCIHRP opportunity through their institution’s research grant office or funding database, an invitation to collaborate from their Canadian/Israeli counterpart, or indeed an email from the ISF or CIHR. A single interviewee remarked that although researchers in Israel are aware of the opportunity, it is not as well advertised as other binational grants such as the BSF.

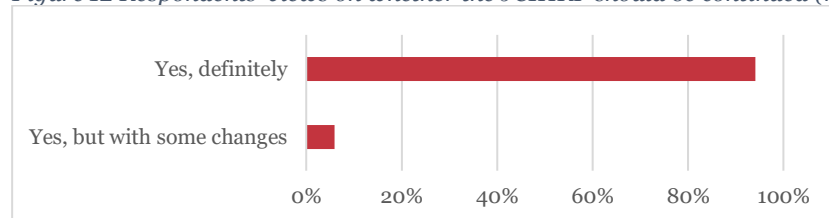
Of the LMIC collaborators interviewed, all were made aware of the opportunity through either the Canadian or Israeli PI approaching them to discuss their interest in being involved. It was not publicized to them via their university. Interestingly, one LMIC interviewee noted that even if she had become aware of the opportunity prior to any engagement with a Canadian or Israeli researcher, it would have been incredibly difficult for her to build a team based on her lack of professional contacts in both Canada and Israel. It was suggested that publishing opportunities in advance via science council websites in LMICs would increase LMIC awareness of the Program and allow LMIC researchers to be proactive in bringing together a research team, rather than waiting for an invite from colleagues in Canada or Israel.

Members of the Governance Committee noted that communication and dissemination of the JCIHRP calls could be improved with the establishment of a clear marketing or advertising strategy. They stated that funders meet their accountability requirements through supplying annual reports to their Governance Committees and government, which is also a mechanism for disseminating the value of the Program.

8.4 Evolution of the JCIHRP and recommendations for change

All survey respondents thought that the Program should continue (Figure 12), albeit of these 6% felt that some changes are needed.

Figure 12 Respondents’ views on whether the JCIHRP should be continued (n=68)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5. Two trainees (Call 2) and three LMIC collaborators (two from Call 1 and one from Call 4) did not answer this question.

Several of the Governance Committee members agreed that the findings of this evaluation would be crucial in guiding the future direction of the JCIHRP. Without this knowledge, it would be difficult for the Committee to make any informed decisions regarding alterations to the Program. However, it was felt that the current approach taken by the Governance Committee was flexible enough to respond to the needs of the consortium. However, the funders will need to discuss how and to what extent they will contribute resources in the next phase of the Program.

One Governance Committee member emphasized that the Program needed to better articulate the desired outcomes of innovation and clinical application within the call texts to ensure that these are adequately considered by applicants and remain a potential outcome of funded projects. Moreover, this member believes that the Program should be able to accommodate LMIC participants as co-PIs and not just as collaborators.

Although there was a general sense from all stakeholders interviewed that the structure and design of the JCIHRP had facilitated achievement of the main program objectives and provided a valuable source of research funding, a number of suggestions were made regarding potential alterations to the Program.

It was suggested that an event or meeting at the end of a funded call period may be useful for researchers funded within that specific call to present and discuss their findings. This could improve knowledge dissemination within the field and act as a potential ‘match-maker’ event to foster further collaborations. Furthermore, it would be beneficial to host this event in a participating LMIC institute to further enable capacity building opportunities. It was also noted that in some cases more meaningful input from LMICs could be achieved by their inclusion within the team at a higher level, i.e. as a PI. This would allow LMIC researchers to obtain greater exposure within the international research community and also create the potential for them to improve both their personal and institutional reputation.

From the perspective of the Israeli and Canadian PIs, it was felt that more information and guidance from the funders at the proposal writing stage would be useful so that PIs could obtain advice on the best mechanisms for engaging with LMICs to facilitate the most meaningful collaboration.

Adjudication panel chairs had conflicting opinions regarding the most beneficial direction to proceed in with regard to call themes. One panel chair felt that the calls could benefit from being more specific in order to target the best researchers in both Canada and Israel. Another felt that running a broad biomedical call for several successive years would better facilitate the progression of research towards potential application. A member of the Governance Committee agreed that sticking with a similar call for several years in a row would allow the Program to deepen its foothold within a specific research area and allow JCIHRP researchers the opportunity to receive direct follow-on funding, improving their ability to progress their research and also allowing any trainees included with the research team to progress their careers. An LMIC collaborator also suggested increasing the funded period to 4-5 years with the rationale that this is a realistic timeframe to conduct basic biomedical research and make strides towards technological advancement. This could also be achieved by creating the possibility of JCIHRP funding extensions for a year or so.

9 Conclusions and recommendations

9.1 Limitations of this evaluation

This evaluation has some limitations. Firstly, most of the projects are not complete so it is difficult to directly evaluate if the envisaged impacts such as ‘enduring changes’ and ‘medical innovation’ (see Figure 1) are likely to be achieved. In any case, these impacts will not be attained within the timeline of the projects and will also depend on external factors in the wider landscape. Secondly, no unsuccessful applicants or independent experts with knowledge of the wider research landscape in Canada, Israel and LMICs were consulted in this evaluation. Thus, we do not have a robust benchmark and counterfactual for the Program’s added value and relevance. On the other hand, these stakeholders are unlikely to have thorough knowledge of the JCIHRP itself and hence might have added limited value to the current evaluation. Thirdly, except for the adjudication panel members, most of the individuals contributing data to this evaluation are closely associated with the Program, so there might be some inherent bias in the findings. Finally, most of the data collected on outputs and outcomes is self-reported and respondents may have under- or over-estimated their outputs and outcomes or indeed misunderstood the question being posed. A thorough verification of the self-reported information was beyond the scope of the current evaluation. Moreover, there may be some over- or under-estimation of output numbers depending on the criteria used for analysis. For instance, there may be double counting of publications when all responses are combined and underestimation of the number of publications when analyzed per project. Hence, the output and outcome data should be interpreted with caution.

9.2 Conclusions

While the origin of the JCIHRP may appear serendipitous, the funders have worked effectively to ensure alignment of the Program with very different mandates, processes and objectives. This has been enabled by the ‘quality of the voice’ at the table and consensus-based decision making. The funders have worked hard and appear to have succeeded in creating a system that works for all.

The Program is filling a gap in the international research landscape. It is the only funding Program that funds trilateral collaborations between Canada, Israel and LMICs in the area of basic biomedical research. It offers added value in terms of a higher budget than most domestic programs in the participants' countries, support of unique collaborations and novel research ideas, opportunity to broaden research networks and the diversity of collaborators.

Furthermore, the program design is suited to achieving the program objectives. However, there is a need to review the nature of LMIC participation and the expectations thereof.

The chief objective of the Program remains to enable path-breaking basic research and the key to that is funding the best proposals and the best teams for each call. This is enabled by an adjudication process that meets international standards in terms of the adjudication criteria, processes and panel composition. So far 24 projects have been funded since 2015. Most of the LMIC engagement is with upper middle-income countries with the exception of India, Kenya and Nepal.

JCIHRP-funded researchers suggest that broadly the intended outcomes are being achieved. High quality collaborations are being funded and projects are advancing biomedical research and discovery with the elucidation of basic molecular mechanisms and some, limited technological innovation. The latter is to be expected as the Program is focused on basic research rather than translational research. However, it must be noted that technological innovation is unlikely to be a major direct outcome of the project if the focus on basic research is continued.

The collaborations are also providing a good foundation for building networks, technical and soft skills as well as professional development. The international aspect of the collaboration helps to bring together complementary expertise as well as alternative perspectives that enrich the quality of the research. Importantly, most of the collaborations are new and there is evidence of these being sustained and/or broadened, indicating that the desired project outcome of facilitating sustainable research networks between Canada, Israel and LMICs will be met.

The Program's structure enables exchange of knowledge and skills across continents and has led to an increased ability and more confidence in conducting international research not only among LMIC participants but the more established Canadian and Israeli researchers as well. However, the evidence for capacity building in LMICs and wider impacts beyond the immediate project team is weaker. While graduate students and postdoctoral fellows are being trained, there is no indication from the data gathered so far that the JCIHRP is helping to build or support future leaders. That is not to say that this output will not emerge from the Program but rather that this is likely to be a more long-term and indirect impact.

The LMIC component is problematic for several reasons. Firstly, the LMIC involvement is variable both in terms of the activity and the level of seniority of the researcher involved. For instance, the LMIC component can be fulfilled through a workshop, an LMIC trainee working in a Canadian lab or a senior LMIC researcher conducting research in their own country. In the first two instances, capacity building is likely to be limited to personal skills development. An LMIC trainee working in Canada would not represent capacity building in an LMIC unless they returned to their home country and disseminated their newly acquired skills and experiences. Similarly, some of the LMIC institutions being funded are the premier institutes in their country, already well funded and well equipped, thus limiting the need for further capacity building. In some instances, LMIC collaborators have been unable to access funds for bureaucratic reasons, and thus have not been able to build capacity *in situ* as originally envisaged. Conversely, the level of involvement and contribution expected from or provided by the LMIC collaborator may be minimal in which case no capacity building occurs. It is important to note here that LMIC participation could also be affected by inadequate communication, infrastructure, administrative resources and/or scientific capacity in the area of a call. To summarise, the variability in the extent and nature of LMIC involvement and lack of clarity around this involvement as evidenced in the interviews is impacting on the program's ability to deliver this outcome in a meaningful way.

9.3 Recommendations

In light of the evidence collected as part of the evaluation, we formulated the following recommendations for the funders to consider:

1. Strategic selection of future annual themes to enable desired program impacts

The initial focus on neuroscience has evolved over the years of JCIHRP implementation and resulted in new topic areas in each annual call. While there are arguments for either targeting new and specific biomedical areas each year or running broad biomedical calls in successive years, we believe that the JCIHRP has already identified key areas where Canadian and Israeli researchers can make the greatest contribution in accordance with the funders' remit. This initial phase may be considered as exploration of the best science and learning from project outcomes. However, the funders will need to decide whether they focus on a small number of key research areas and provide sustained support to these or broaden out and push for more interdisciplinary discovery science. The former approach may be closer to the funders' long-term aspiration to build research capacity and translate fundamental research findings into real-world applications for the greatest impact.

In any case, the current process to identify key research areas should be made more transparent and inclusive by conducting formal capacity and needs assessments, including input from the broader scientific community in Canada and Israel and considering relevance for LMICs. The governance committee can then undertake a prioritisation exercise so that they arrive at relevant and feasible call topics based on pre-defined criteria. Documenting the priority-setting process and sharing the results with relevant stakeholders will ensure transparency. This will ultimately help to fulfil unmet demands for research funding, build on emerging research strengths and make the greatest impact to meet funders' objectives. However, it is recognised that implementation of such a process will require additional time and resources.

This recommendation is closely linked to the need for funders to review the JCIHRP theory of change and align the program objectives better with the expected outcomes and impacts. Now that funders have more experience with the program and have better knowledge on how it is working, it is worth revisiting what they want to achieve from the program, what is realistic with the available funding and whether the program structure needs to be modified to maximize the desired outcomes. For example, if technological innovation and organizational capacity building in LMICs will remain central aims and desired outcomes, these need to be reflected in the call texts and adjudication criteria so that the research community has clarity about expectations and can prepare the best applications possible.

2. Involvement of LMIC partners needs to be further clarified

Expectations regarding the level and type of involvement of LMIC researchers should be clearer for applicants so as to help them draft the collaboration plan. Funders undoubtedly recognize the inherent tension between the research collaboration and the capacity building elements. For high quality scientific collaborations and outcomes to be achieved, the best scientists in LMICs should be encouraged to participate, in which case the capacity building element may be less relevant. Conversely, for capacity building, LMIC institutes with existing critical mass and research infrastructure will become less relevant.

To enhance the benefit from LMIC collaboration, LMIC researchers should be integrated in a more meaningful way in the projects, perhaps through enhanced roles and responsibilities from project design to dissemination of research findings. This should also involve providing appropriate funding, and call texts may explicitly state the minimum level of activity and expected budget allocation range available for LMICs.

3. Purpose of capacity building needs to be further defined

The purpose and scope of the capacity building element needs to be elaborated from both human and organizational perspectives. While skills development at the level of individual researchers and the creation of new collaborative networks should not be undervalued, this will not necessarily lead to organizational capacity building in an LMIC. Research visits and training of LMIC researchers in Canada and Israel will only result in direct knowledge gain in LMICs if these researchers become embedded in LMIC institutes. If so, call texts need to make the expectations clearer. Nevertheless, it is recognized that capacity building is also of relevance for Israel and Canada, with knowledge being exchanged in new international collaborations that would not have necessarily emerged otherwise.

It is evident that multiple projects at the same institutes would offer a crucial opportunity to build critical mass and hence organizational capacity. However, it appears that funders currently do not have influence over the LMIC institution that is involved in the collaboration. Perhaps more intensive awareness raising at key LMIC institutions would encourage more collaborative activities emerging bottom-up.

True capacity building might also mean moving away from funding well-established institutions in more research-intensive upper middle-income countries to less established institutions in countries where research capacity is weaker.

4. Facilitation of new sustainable international networks and knowledge exchange

Following on from the earlier recommendation on the need for sustainable capacity building, funders could consider establishing a dedicated budget line for coordination and support activities to facilitate creation of international networks and knowledge exchange within JCIHRP. This could be achieved through one or more meetings for all project teams funded under a given call. This would improve knowledge exchange within the field and act as a potential ‘match-maker’ to foster further collaborations. In addition, creating an online platform for alumni would also support this activity, providing current participants and those from earlier completed projects a forum to connect and exchange ideas. Finally, since the JCIHRP provides a unique configuration for international research partnerships in biomedical sciences, a final international conference with participation from programme beneficiaries, programme managers and funders may provide a valuable opportunity to discuss more broadly how to grow such trilateral scientific collaborations in the future.

5. Increased marketing of the funding opportunity and dissemination of the value of the program

There is a need to market the funding opportunity more extensively in order to further raise awareness about the Program to encourage more and diverse applications from high quality researchers. Social media campaigns and direct outreach to researchers, including through conferences and institutional research offices would be recommended. Similar channels could be used to disseminate the knowledge and value of the programme using short articles, case studies and news items. However, it is recognized that, if implemented, such a process will require additional time and resources.

Appendix A Approach and Methodology

A.1 Approach

The study team employed a mixed methods approach to address the evaluation questions, organized around three main phases of work:

- **Phase 1: Inception phase (scoping and method development)** – included an initial kick-off meeting, preliminary document review and scoping interviews with the Program Directors. The evaluation approach, including review of the theory of change, evaluation framework and data collection tools were also finalized at this stage.
- **Phase 2: Primary data collection** – included an in-depth review of project documentation (including technical reports for projects that reached completion); an online survey of funding beneficiaries; and a program of semi-structured interviews with a sample of Governance Committee members, adjudication committee members, principal applicants, LMIC collaborators and other researchers and trainees supported by JCIHRP funding.
- **Phase 3: Analysis and reporting** – included the full analysis of all evidence collected during the first two phases and addressing the evaluation questions. We also completed a number of case studies to illustrate how JCIHRP-funded research has or is expected to enable real world change at the program level. The findings and conclusions are presented in this report.

A.2 Evaluation framework

A.2.1. JCIHRP theory of change

Our evaluation was guided by the theory of change that draws connections between the support provided by the program partners (inputs) and the outputs and outcomes they are expected to generate. The theory of change articulates how the intervention (JCIHRP) is anticipated to bring about outcomes and eventually impacts in the long term. The theory of change for the first phase of the JCIHRP (2015-2022) states that “*fostering collaborative health research in different areas of biomedical science will bring enduring changes and medical innovation across the globe*”. The envisaged impacts, i.e. ‘enduring changes’ and ‘medical innovation’, will not be attained within the timeline of the current program and will depend on external factors stemming from the broader research and innovation landscape, for instance, the behaviour and absorptive capacities of the research, research funding, healthcare and industry sectors. As such, the JCIHRP’s influence on achieving the articulated impacts will be indirect, particularly with regard to fostering medical innovation since the JCIHRP currently funds basic research rather than applied research.

Nonetheless, we can follow the logical sequence and causal relationships among the resources (inputs), results (outputs and outcomes) and expected impacts underlying the theory of change. By identifying the emerging outputs and outcomes from the funded projects, we were able to analyse the effectiveness and performance of the JCIHRP and provide an early indication of whether the Program is progressing toward achieving its expected impacts.

We reviewed and adapted the funders’ theory of change diagram based on findings from the initial document review and scoping interviews (see Figure 1). Small changes were made mostly to make some of the inputs, outputs, outcomes, and impacts more explicit and distinct, and to aid the development of the evaluation framework, associated key performance indicators (KPIs) as well as the data collection tools (survey and interview questionnaires).

A.2.2. Evaluation framework

Our finalized methodological approach, KPIs and methods/data sources to answer the evaluation questions are outlined in Table 4. This framework was used to develop the consultation tools (questionnaires for interviews and survey).

Table 4 JCIHRP evaluation framework

Evaluation question	Key Performance Indicators	Methods and data sources
<i>Appropriateness and Relevance</i>		
To what extent does the JCIHRP align with the objectives and priorities of its funding partners?	Not applicable	Document review Program Director and Governance Committee member interviews
To what extent is the JCIHRP’s design suitable to meet its three objectives?	Not applicable	Document review Technical reports Interviews (all stakeholders)
To what extent is the JCIHRP being implemented as designed?	Not applicable	Document review Technical reports Program Director and Governance Committee member interviews
To what extent is the Program unique in funding research in the biomedical field? Is its uniqueness relevant to grantees?	Proportion of survey respondents replying ‘yes’ when asked if the Program is unique	Interviews (all stakeholders) Beneficiary survey
To what extent is there an ongoing and demonstrable need for the JCIHRP?	Not applicable	Interviews (all stakeholders)
<i>Effectiveness/Performance</i>		
<p>How well is the JCIHRP achieving its expected outcomes?</p> <ul style="list-style-type: none"> • Advanced research and discovery • Developed new or built on existing Canadian and Israeli scientific collaborations • Strengthened capacity (trainees, ability to conduct international research, peer-to-peer professional development) • Inclusion and benefit flows to LMIC collaborators 	<p>Number of publications Number of conference/meeting abstracts and presentations</p> <p>Number of research projects funded Number of existing partnerships funded (i.e. number of funded projects where partners have previously worked together) Number of visits to the partner’s lab Number of seminars/talks at the partner’s institution</p> <p>Number of people trained (eg MSc/PhD students, postdocs) Number of women principal investigators Number of women trainees Number of awards and prizes received by project participants</p> <p>Number of LMIC collaborators</p>	<p>Technical reports Beneficiary survey Beneficiary interviews Potential case study</p>

	Number of LMIC researchers trained Number of publications citing LMIC researchers as author	
To what extent has the JCIHRP built capacity in biomedical research in low- and middle-income countries (LMICs)?	Number of LMIC researchers trained Proportion of survey respondents replying 'yes' when asked whether their project has led to development of skills and infrastructure in LMICs	Technical reports Beneficiary survey Beneficiary interviews
Has the JCIHRP's selection process been able to attract high quality proposals?	Average score of funded and unfunded proposals	Anonymized application scores for each call Interviews (especially adjudication committee members) Beneficiary survey
Is the Program adapting appropriately overtime to ensure the quality of applications and applicants?	Not applicable	Document review Program Director, Governance Committee member and adjudication committee member interviews
Does the JCIHRP's structure, governance and processes facilitate or inhibit its performance (i.e., achievement of expected outcomes), and would alternative models result in better or worse performance?	Not applicable	Document review including Technical reports Interviews (all stakeholders)
<i>Emerging results</i>		
What are the intended and unintended outcomes and their direct and indirect attribution to the JCIHRP?	Not applicable	Beneficiary interviews (mainly) Other stakeholder interviews (to a lesser extent) Potential case study
To what extent have projects supported by JCIHRP advanced science in the biomedical field?	Number of publications (published or in preparation) Number of conference/meeting abstracts and presentations Proportion of survey respondents agreeing that their project has advanced research and discovery in biomedicine Proportion of survey respondents stating that their project has led to elucidation of basic biological mechanisms or technological innovation in human and animal health	Technical reports Beneficiary survey Beneficiary interviews Potential case study
<i>Sustainability</i>		
What emerging Program legacies are not dependent on further funding? <ul style="list-style-type: none">• Access to, influence of, and use of research findings	Proportion of survey respondents replying 'yes' when asked whether their project's research findings have influenced or been accessed/used by other researchers	Technical reports Interviews (all stakeholders) Beneficiary survey

<ul style="list-style-type: none"> • New research projects launched • New partnerships developed (e.g. with the private sector, hospitals, governments) • Trainees applying their skills in related fields 	<p>Number of new projects (not funded by JCIHRP) with collaborators or institutions involved in JCIHRP projects</p> <p>Number of future planned projects with collaborators or institutions involved in JCIHRP projects</p> <hr/> <p>Number of new projects/partnerships with non-academic partners</p> <hr/> <p>Proportion of survey respondents replying 'yes' when asked whether their project has led to trainees applying their skills in related fields</p>	<p>Potential case study</p>
<i>Value</i>		
<p>What is the added value of the JCIHRP over existing funding opportunities from the point of view of funded researchers (and trainees)?</p>	<p>Not applicable</p>	<p>Beneficiary interviews Potential case study</p>
<p>What features of the Program would researchers and trainees involved change and what would they keep?</p>	<p>Not applicable</p>	<p>Beneficiary interviews</p>
<p>How well has the value of the Program been communicated with key audiences? How could this be improved?</p>	<p>Not applicable</p>	<p>Interviews (all stakeholders)</p>

A.3 Methodology

A.3.1. Document review

The study team undertook a review of documents related to the JCIHRP strategy, structure and governance, calls for proposals, adjudication process and types of projects funded. These included documents provided by the IDRC such as the call texts, the JCIHRP memorandum of understanding, the theory of change, the proposal adjudication guide, Governance Committee documentation including meeting agendas and minutes as well as four technical reports of Call 1 projects.

A.3.2. Interviews

- **Scoping interviews**

The study team undertook a number of scoping interviews (for interview guide, see Appendix B) with the Program Directors (from IDRC, ISF, CIHR and AF) to begin exploring the structure and governance of the JCIHRP along with the strategic drivers underpinning the program objectives, and the implementation of the Program. Expected outputs and outcomes of the projects as well as the overall value of the JCIHRP in the funding landscape were also discussed.

- **Interviews**

A program of semi-structured interviews was conducted to allow the study team to gather further views and insights from a purposeful sample of beneficiaries, Governance Committee members and adjudication committee members.

The stakeholder interviews allowed the study team to develop a deeper understanding of the ‘how’ and the ‘why’, as well as the successes and challenges of the JCIHRP. The semi-structured approach allowed the interviewers flexibility to probe responses and explore issues that emerge in the course of discussion, while giving respondents the freedom to offer their own perspective. The following stakeholders were interviewed:

- 8 Governance Committee members to gather strategic insights about the Program in terms of its design, structure and implementation processes
- 4 interviews with adjudication committee chairs of three calls and the scientific officer of one call to gather views on the program structure, quality of proposals received and the adjudication process
- 11 interviews with program beneficiaries – 4 Canadian PIs, 3 Israeli PIs, 3 LMIC collaborators and 1 PhD student (Israel). We did not interview any award recipients from Call 4 as projects have only very recently been funded.

The interview guides can be found in Appendix C, Appendix D and Appendix E respectively.

A.3.3. Survey of funding beneficiaries

The purpose of the beneficiary survey was to collect information regarding the project team members’ experience and opinions of the JCIHRP. Based on the contact list provided by the IDRC we contacted about 80 individuals including the Canadian and Israeli principal investigators and the LMIC collaborator/s to complete the survey. We used a cascading approach (asking principal investigators to forward the survey) to ensure that all individuals (including trainees) involved in JCIHRP-funded projects had the opportunity to express their views regarding the Program. In total, 73 partial and complete responses were received (see Appendix G.1 for breakdown by respondent type). The survey questionnaire can be found in Appendix F.

A.3.4. Case studies

The study team developed three case studies to illustrate how JCIHRP funded research has or is expected to enable real world change at the program level. We focused on cases demonstrating emerging scientific impact, collaboration and capacity building i.e. the objectives of the JCIHRP. These were largely based on beneficiary interviews.

Appendix B Scoping interview guide

Introduction	
1	Please say a little bit about your organization, your role within it.
2	Please give an overview of your organization's role within the JCIHRP consortium.
Strategy	
3	How do your organization's objectives and priorities align with those of the JCIHRP?
4	Was there a particular driver (e.g. political, scientific, policy, strategic) that stimulated the creation of the JCIHRP? <ul style="list-style-type: none"> • What made the four funders come together?
5	What was the rationale for funding basic health research rather than applied health research? <ul style="list-style-type: none"> • Was this a strategic decision? • How have the themes been selected?
6	What was the rationale for including an LMIC within each project?
Structure and Governance	
7	In your view, does the JCIHRP's structure foster delivery of the Program objectives? <ul style="list-style-type: none"> • How does it facilitate and/or inhibit progress towards the expected outcomes of the Program? • Would alternative structures result in better or worse results? What could be improved?
8	In your view, is the governance model effective for delivering Program objectives? <ul style="list-style-type: none"> • Is it resourced adequately e.g. in terms of people and time? • What are the pros and cons of this model? What could be improved?
Implementation	
9	Have there been any key successes or challenges related to implementation? <ul style="list-style-type: none"> • Is the JCIHRP being implemented as designed?
10	Has the JCIHRP's selection process been successful in attracting high quality proposals? <ul style="list-style-type: none"> • What is your role in the selection process, if any? • Is the adjudication panel appointed annually? By topic area?
Outputs and outcomes	
11	What are the expected outputs and outcomes of the JCIHRP funded projects? <ul style="list-style-type: none"> • Publications, PhDs, MSc's, conference invites • Collaboration and capacity building, to what end? Capacity building for LMICs only? • Probe for any other outputs.
12	What impacts do you expect in the long term?
13	Regarding the project monitoring reports (held by IDRC). What information do these reports contain? <ul style="list-style-type: none"> • Project monitoring data?
Value of the JCIHRP	
14	What value do you feel the JCIHRP adds, above and beyond other funding opportunities?

15	<p>How is the value of the Program being communicated with key audiences?</p> <ul style="list-style-type: none"> • Who are these key audiences in your view?
16	<p>How do you foresee the JCIHRP evolving?</p> <ul style="list-style-type: none"> • For example in a potential second wave. • Would you make any changes to the current Program?
Further comments	
17	<p>Would you like to make any additional comments?</p>

Appendix C Beneficiary interview guide

Introduction	
1	Please say a little bit about your organization, and your role (if any) within the project.
Appropriateness and relevance	
2	In your view, to what extent is the JCIHRP's design appropriate for meeting its three objectives i.e. advancing biomedical research and discovery; encouraging collaboration between Canada, Israel and LMICs; and providing capacity building opportunities?
3	To what extent is the JCIHRP unique in funding research in the biomedical field? <ul style="list-style-type: none"> • If yes, how is it unique? On what fronts?
4	Does the JCIHRP fill an existing gap in the research funding landscape? <ul style="list-style-type: none"> • If yes, what gap does it fill and to what extent?
5	Is the JCIHRP relevant to your and/or your institution's research needs? <ul style="list-style-type: none"> • If so, how and to what extent does the JCIHRP fulfil these needs?
Funding Process (for PIs only)	
6	How did you go about building an application for the JCIHRP? <ul style="list-style-type: none"> • How did you find out about the JCIHRP call for proposals? • What was your motivation for applying e.g. opportunity for high quality international collaboration, capacity building in LMIC? • How was the project team formed? Was there a prior history of working together? • What was the role of the various partners including the LMIC collaborator/s? • Were the call instructions, eligibility criteria and objectives clear? • Did you get any support from people outside the project team?
7	What is your opinion of the selection process used by the funder? <ul style="list-style-type: none"> • Do you feel that this process enabled the selection of high quality projects for the JCIHRP?
8	Would you consider applying for JCIHRP funding again, in the future? Why?
Effectiveness	
9	In your opinion, are the JCIHRP's processes (e.g. governance, project selection, reporting and monitoring processes) adequate and fit for achieving its objectives? And why? <ul style="list-style-type: none"> • Would you recommend any changes to improve the JCIHRP's performance?
10	[For PIs only] How is your interaction with funders with regard to the following? <ul style="list-style-type: none"> ○ Suitability of project deliverables and timetabling ○ Advice regarding project-related issues ○ Help and advice around follow-on funding
11	How effective has the project funding been in allowing the development of new collaborative relationships? <ul style="list-style-type: none"> • For example between PI institutions and LMIC collaborators • Has the funding kickstarted new collaborations that otherwise would not have been possible?
12	How effective has the project been in strengthening capacity within your team/institution? How did this happen? Probe for: <ul style="list-style-type: none"> • Development of technical research skills in biomedicine • Training of MSc / PhD students and postdocs • Development of infrastructure within institutions • Improved ability of researchers to conduct international research • Expanded professional networks • Other opportunities for emerging leaders and trainees

13	<p>How effective has the JCIHRP been in building research capacity in LMICs?</p> <ul style="list-style-type: none"> For instance, have LMIC researchers participated in knowledge exchange events (ie training, workshops, conferences); been involved in project design, implementation [data collection and analysis] and reporting; have written academic publications?
14	<p>Did the JCIHRP offer opportunities to exchange experiences with other JCIHRP-funded research teams?</p> <ul style="list-style-type: none"> Any opportunities to attend training courses, workshops, conferences, etc.? If so, did this help to increase scientific networking?
15	<p>Would you change anything about the JCIHRP to make it more effective?</p>
Experience of collaboration and emerging results	
16	<p>Could you comment on your/your institution's experience of collaboration within the JCIHRP project?</p> <ul style="list-style-type: none"> For example, with researchers in your country or from other countries? What was the extent of your contribution and how was this received by partners? What lessons or skills have your/your institution gained from working on the project? What is the balance of gender and career levels in the project team/s?
17	<p>To what extent has your/your institution's project contributed to the advancement of research and discovery or technical innovation in the biomedical field?</p>
18	<p>Have there been any unintended positive or negative outcomes from your/your institution's project?</p> <ul style="list-style-type: none"> For example, new grants, new collaborations, new trainees outside JCIHRP funded project Any institution-wide impacts? Is there a potential conflict between capacity building and expected scientific outcomes in project delivery?
19	<p>Do you feel that the monitoring and reporting processes are adequate and effective for enabling and tracking the expected outputs and outcomes?</p> <ul style="list-style-type: none"> Please comment on the burden involved in meeting the reporting requirements. Is it manageable? Are the right aspects of the projects being monitored?
20	<p>What one aspect would you say impacts/impacted significantly on your experience of the JCIHRP?</p>
Added value	
21	<p>What value do you feel the JCIHRP adds, above and beyond any existing funding opportunities?</p> <ul style="list-style-type: none"> How does the JCIHRP compare with other research funding programs?
22	<p>Are there any attributes of the JCIHRP that stand out to you as particularly successful?</p>
23	<p>How well is the value of the Program being communicated with key audiences?</p> <ul style="list-style-type: none"> Who are the key audiences? Could communication be improved?
Sustainability	
24	<p>Do you think the collaborations and networks formed during this project will be sustained after the funded period?</p> <ul style="list-style-type: none"> Are you planning to launch new research projects as a result of your JCIHRP experience?
25	<p>Have you seen or do you expect to see the following emerging as a result of collaborating on the JCIHRP project/s?</p> <ul style="list-style-type: none"> New partnerships outside project team e.g. with academic sector, private sector, hospitals and governments Use of or influence of research findings in the immediate and wider research fields Trainees applying their skills in related fields
26	<p>Would you like to see the JCIHRP continue?</p> <ul style="list-style-type: none"> Would you make any changes to the current Program?
Further comments	
27	<p>We are looking to develop case studies to illustrate how JCIHRP funded research has or is expected to enable real world change at the Program level. To that end, can you suggest an interesting case?</p>
28	<p>Would you like to make any additional comments?</p>

Appendix D Governance Committee member interview guide

Introduction	
1	Please say a little bit about your organization and your role within it.
2	Please give an overview of your role within the JCIHRP consortium, and more specifically the Governance Committee.
Rationale, appropriateness and relevance	
3	How do your organization's objectives and priorities align with those of the JCIHRP?
4	Was there a particular driver (e.g. political, scientific, policy, strategic) that stimulated the creation of the JCIHRP? <ul style="list-style-type: none"> • Were the funders trying to address a particular need or gap? Does this need or gap still exist? • What made the four funders come together?
5	How is basic research funded by the JCIHRP intended to drive technological innovation, one of the intended outcomes in the theory of change?
6	What are the intended benefits for Canadian, Israeli and LMIC researchers from the JCIHRP?
Implementation and performance	
7	In your view, does the JCIHRP's structure foster delivery of the Program objectives? <ul style="list-style-type: none"> • How does it enable and/or constrain progress towards the expected outcomes of the Program? • Were alternative structures/designs considered, for example, for selection of themes, adjudication of proposals, reporting and monitoring, etc.? If yes, what were they? • How could the current structure be improved?
8	In your view, is the governance model effective for delivering Program objectives? <ul style="list-style-type: none"> • Is it resourced adequately e.g. in terms of people and time? • What are the pros and cons of this model? What could be improved?
09	How does the Governance Committee decide the annual theme? <ul style="list-style-type: none"> • Are needs assessments performed prior to deciding on the theme? In your view, is the process of developing a longlist of themes as input to the committee's decision making inclusive, transparent and consistent? • How do you collectively select one annual theme from the themes proposed?
10	In your view, has the JCIHRP's selection process been successful in attracting high quality proposals? <ul style="list-style-type: none"> • Is the Program adapting appropriately over time to ensure the high quality of applications and applicants? • Is a good balance of gender and career levels being achieved in the project teams? Are these criteria considered when deciding to fund a project? • In your view, is the proposed LMIC involvement in projects selected for funding meaningful and fair?
Outputs and outcomes: emerging results	
11	What outputs and outcomes do you expect from the JCIHRP funded projects? Which of these are most important in your view? <ul style="list-style-type: none"> • Advancement of research and discovery evidenced by publications, conference/meeting presentations, etc. • Technological innovation • Strengthened international collaboration evidenced by new or reinforced collaborations between Canadian, Israeli and LMIC researchers

	<ul style="list-style-type: none"> • Capacity building evidenced by people trained (Master's, PhDs, postdocs) in Canada, Israel and LMICs; emerging research leaders and institutions in LMICs; and increased ability to conduct international research • Any other outputs and outcomes
12	<p>In your view, to what extent are the expected outputs and outcomes being realized in the JCIHRP projects? Please provide examples if you can.</p> <ul style="list-style-type: none"> • Do you know of any unintended positive or negative outcomes?
	Value and sustainability of the JCIHRP
13	<p>What value do you feel the JCIHRP adds, above and beyond any existing funding opportunities?</p> <ul style="list-style-type: none"> • Do you think the JCIHRP collaborations and networks will be sustained after the funded period?
14	<p>How well is the value of the Program being communicated with key audiences?</p> <ul style="list-style-type: none"> • Who are the key audiences? • Could the communication be improved?
15	<p>How do you foresee the JCIHRP evolving?</p> <ul style="list-style-type: none"> • Would you recommend any changes to the current Program? • Any other support mechanisms that could be included to enable the desired outcomes and impacts?
	Further comments
16	<p>Would you like to make any additional comments?</p>

Appendix E Adjudication committee member interview guide

Introduction	
1	<p>Please say a little bit about your research background and your role in the JCIHRP?</p> <ul style="list-style-type: none"> • How did you become a JCIHRP adjudication committee member?
Appropriateness and relevance	
2	<p>In your view, to what extent is the JCIHRP's structure appropriate for meeting its three objectives i.e. advancing biomedical research and discovery; encouraging meaningful and fair collaboration between Canada, Israel and LMICs; and providing capacity building opportunities?</p>
3	<p>Does the JCIHRP fill an existing gap in the research funding landscape?</p> <ul style="list-style-type: none"> • If yes, what gap does it fill and to what extent? • In your view, to what extent does the JCIHRP address the needs of the researchers it wants to fund? • To what extent is the JCIHRP unique in funding collaborative biomedical research? If so, how is it unique?
Adjudication process	
4	<p>How well do the call texts for proposals articulate the JCIHRP's aims and objectives?</p>
5	<p>Can you comment on the composition and quality of expertise in the adjudication panel?</p> <ul style="list-style-type: none"> • Is the composition and quality appropriate and/or representative of the international research community for the specific theme? For example, in terms of gender balance, research career stage, the leading researchers in the field etc.?
6	<p>What support do you get from the funders? Is that sufficient or would you like to suggest additional measures?</p>
7	<p>Please comment on the general quality of proposals received.</p> <ul style="list-style-type: none"> • Is a good balance of gender and career levels being achieved in the project teams? Do you consider these criteria in the adjudication process? • Are the top Canadian and Israeli researchers in the selected field applying? Do you also see emerging researchers applying? • In your view, is the proposed LMIC involvement meaningful and fair?
8	<p>How suitable are the adjudication criteria and process for enabling the Program to meet its objectives ?</p> <ul style="list-style-type: none"> • What are the pros and cons of the current criteria and processes? • How well are conflicts of interest managed?
9	<p>Overall, do the adjudication criteria and process allow the selection of the highest quality proposals?</p> <ul style="list-style-type: none"> • How do the adjudication criteria and process compare to international standards? • Is the Program adapting appropriately over time to ensure the quality of applications and applicants? • Would you recommend any changes?
Outputs and outcomes: emerging results	
10	<p>What outputs and outcomes would you expect from the JCIHRP funded projects?</p> <ul style="list-style-type: none"> • Advancement of research and discovery evidenced by publications, conference/meeting presentations, etc. • Technological innovation • Strengthened international collaboration evidenced by new or reinforced collaborations between Canadian, Israeli and LMIC researchers • Capacity building evidenced by people trained (Master's, PhDs, postdocs) in Canada, Israel and LMICs; emerging research leaders and institutions in LMICs; and increased ability to conduct international research • Any other outputs and outcomes
11	<p>Would you expect any unintended positive and negative outcomes from the JCIHRP? Please elaborate.</p> <ul style="list-style-type: none"> • For example, some institutions and LMICs have multiple projects, while others have only one. Does this affect capacity building-related outcomes? • Any unintended impact of the capacity building element on scientific outcomes and vice versa?
Value and sustainability of the JCIHRP	

12	What value do you feel the JCIHRP adds, above and beyond any existing funding opportunities?
13	Would you recommend any changes to the current Program?
	Further comments
14	Would you like to make any additional comments?

Appendix F Beneficiary survey questionnaire

Introduction

Technopolis, an independent research organization, has been commissioned to conduct a Program evaluation of the Joint Canada-Israel Health Research Program (JCIHRP) by Canada’s International Development Research Centre (IDRC) on behalf of the JCIHRP partners, namely the IDRC, the Canadian Institutes of Health Research, the Israel Science Foundation and the Azrieli Foundation.

This survey intends to gather feedback from the funding beneficiaries on the Program and its emerging outputs and impacts. The responses will be used for evaluating the JCIHRP as a whole and informing its development and future direction rather than assessing individual projects. To that end, we would be grateful if you could complete a 15 minute questionnaire using the link below.

Responses can be provided anonymously. Any data will be reported in aggregated form and will be deleted from the survey platform at the end of the evaluation. Individual responses will not be shared outside the evaluation team. Full details on how the study team will use this information are available at <http://www.technopolis-group.com/privacy-policy/>.

Please note that the SurveyMonkey stored data on servers in the US. Further information on their data privacy policy can be found at <https://www.surveymonkey.com/mp/legal/privacy-policy/>.

About you

1. In which year and call was your project funding awarded?

2015 Neuroscience	<input type="checkbox"/>
2016 Immunology	<input type="checkbox"/>
2017 Cancer	<input type="checkbox"/>
2018 Neurobiology	<input type="checkbox"/>

2. Please enter your project title

—

3. In which country are you normally based? Please select the location of your primary institutional affiliation.

Canada	<input type="checkbox"/>
Israel	<input type="checkbox"/>
India	<input type="checkbox"/>
Chile	<input type="checkbox"/>
Malaysia	<input type="checkbox"/>
Mexico	<input type="checkbox"/>
Kenya	<input type="checkbox"/>
China	<input type="checkbox"/>
Turkey	<input type="checkbox"/>
Argentina	<input type="checkbox"/>
Brazil	<input type="checkbox"/>
Nepal	<input type="checkbox"/>
Jordan	<input type="checkbox"/>
United States of America	<input type="checkbox"/>

Other (please specify)	_____
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4. Which of these best describes your role in the project? Please tick all that apply.

Principal investigator	<input type="checkbox"/>
LMIC collaborator	<input type="checkbox"/>
Non-LMIC collaborator	<input type="checkbox"/>
Post-doctoral researcher	<input type="checkbox"/>
PhD student	<input type="checkbox"/>
MSc student	<input type="checkbox"/>

Process

5. To what extent were you satisfied with the following aspects of the application process?

	Very dis-satisfied	Dis-satisfied	Neither satisfied nor dis-satisfied	Satisfied	Very satisfied
Scope of Program i.e. subject area and eligibility criteria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amount of funding offered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instructions for applicants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application stages (e.g. outline, full proposal)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assessment criteria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transparency of the peer review and adjudication process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feedback on application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contract negotiation (e.g. suggested adjustments to the scope of the costs, work or partnership)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other aspect, please specify _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. To what extent were you satisfied with the following post-award aspects?

	Very dis-satisfied	Dis-satisfied	Neither satisfied nor dis-satisfied	Satisfied	Very satisfied	N/A
Reporting requirements i.e. technical reports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suitability of project deliverables and timetabling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advice provided by the funders on project-related issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to exchange experience with other project research teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other aspect, please specify _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Would you consider applying for JCIHRP funding again?

Yes, definitely	<input type="checkbox"/>	Yes, possibly	<input type="checkbox"/>	No, probably not	<input type="checkbox"/>	- If not, please explain why _____
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8. How did you find out about the JCIHRP call for proposals? [select all that apply]

I saw an announcement on the funder's website	<input type="checkbox"/>
I received information from colleagues within my organization	<input type="checkbox"/>
I received an invitation to collaborate from another organization	<input type="checkbox"/>
I saw information about the call through social media (e.g. Twitter)	<input type="checkbox"/>
Other, please specify	_____

9. Had you previously (before JCIHRP) collaborated on a joint research project with any of your project partners?

Yes <input type="checkbox"/>	No <input type="checkbox"/>
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Effectiveness/performance

10. To what extent do you agree or disagree with each of the following statements regarding your JCIHRP-funded project?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	N/A
The project has advanced research and discovery in the biomedical field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has allowed the development of new scientific collaborations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has allowed existing scientific collaborations to be reinforced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has led to strengthened research capacity through training of students and postdoctoral researchers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has allowed professional development of individuals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has led to an improved ability of researchers to conduct international research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has directly benefited my research (e.g. knowledge exchange, inclusion in publications, built networks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has had an impact on the institution I work in (e.g. an increase in LMIC collaboration, strengthened research management, increase in reputation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project has provided a basis for further funding applications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Emerging results

11. Please state whether your project has led to the following direct outcomes.

	Yes, to a large extent	Yes, to some extent	No, not at all	N/A
Elucidation of basic biological mechanisms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development of technological innovation in human or animal health (including clinical and therapeutic applications)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exchange of knowledge, skills and personnel across continents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development of new infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allowed me to develop new technical and transferable skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Strengthening of international research partnerships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New research projects/partnerships outside the JCIHRP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My own professional career development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expansion of my professional networks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project's research findings have influenced or been accessed/used by other researchers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trainees applying their skills in related fields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Please state how many of the following outputs you have already delivered in your JCIHRP project. Please enter a number.

	Delivered
Number of research papers citing you as author	_____
Number of conference or meeting abstracts and presentations citing you as contributor	_____
Total number of knowledge exchange events (i.e. training courses, workshops, conferences) you attended	_____
Number of research visits you made to partners' labs excluding for talks and seminars	_____
Number of seminars/talks you have given at partners' institutions (e.g. to lab, department, institute)	_____
Number of awards and prizes you have received	_____
Number of MSc and PhD students under your supervision	_____
How many of the above were joint PhD students with another country?	_____
Number of postdoctoral researchers under your supervision	_____
Number of women trainees (students and postdocs) under your supervision	_____
Number of LMIC researchers (including students) under your supervision	_____
Number of other new projects (not funded by the JCIHRP) with academic collaborators or institutions involved in the JCIHRP project	_____
Number of other new projects/partnerships you have established with non-academic partners as a result of the JCIHRP project	_____
Number of other outputs eg technical notes, protocols and patents.	_____

13. Please state how many of the following outputs you have already delivered in your JCIHRP project. Please enter a number.

	In pipeline
Number of research papers citing you as author	_____
Number of conference or meeting abstracts and presentations citing you as contributor	_____
Total number of knowledge exchange events (i.e. training courses, workshops, conferences) you plan to attend	_____
Number of research visits you plan to make to partners' labs excluding for talks and seminars	_____
Number of seminars/talks you have given at partners' institutions (e.g. to lab, department, institute)	_____
Number of awards and prizes you are due to receive	_____
Number of MSc and PhD students under your supervision. Of these how many will be joint PhD students (please indicate in parentheses)	_____

Number of postdoctoral researchers under your supervision	_____
Number of women trainees (students and postdocs) under your supervision	_____
Number of LMIC researchers (including students) under your supervision	_____
Number of other new projects (not funded by the JCIHRP) with academic collaborators or institutions involved in the JCIHRP project	_____
Number of other new projects/partnerships with non-academic partners as a result of the JCIHRP project	_____
Number of other outputs eg technical notes, protocols and patents. Please specify _____	_____

Value and sustainability

14. Would you have been able to obtain funding for your current project if it were not for the JCIHRP?

Yes, most probably <input type="checkbox"/>	No, very unlikely <input type="checkbox"/>	Cannot say <input type="checkbox"/>
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15. Do you believe the JCIHRP adds value above and beyond other funding opportunities in the biomedical field?

Yes <input type="checkbox"/>	No <input type="checkbox"/>	Cannot say <input type="checkbox"/>
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Please explain your answer above (eg how does the JCIHRP add value, which other funders fund similar projects, etc) _____

16. Do you think the JCIHRP should be continued?

Yes, definitely <input type="checkbox"/>	Yes, but with some changes <input type="checkbox"/>	No <input type="checkbox"/>
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Please explain your answer above. _____

Final remarks

Thank you for your response. We appreciate your input so far. If you are willing to participate in a short follow-up interview (by telephone or Skype) with the study team to discuss your experience of the JCIHRP further, please provide your contact details below.

Please be assured that your contact details will not be shared outside the study team, and will be deleted on completion of the study. Full details on how the study team will handle your data are available at <http://www.technopolis-group.com/privacy-policy/>.

Name	
Email address	
Comments	

Appendix G Beneficiary survey analysis

G.1 Survey respondents

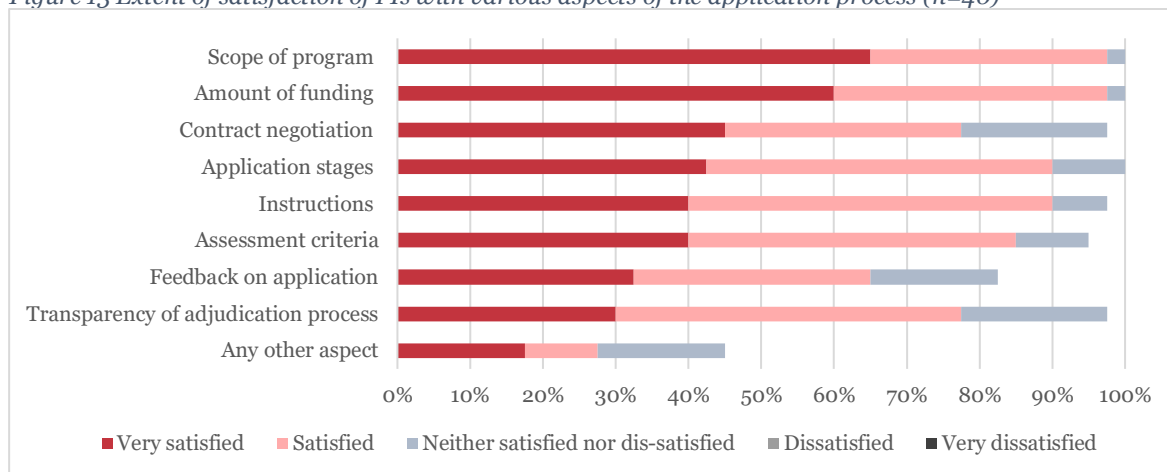
Table 5 below shows the distribution of survey respondents by call and role in the JCIHRP project. For each project, we received at least one complete survey response. Thus, the survey responses represent all the funded projects.

Table 5 Distribution of beneficiary survey respondents by call and role in project

Call	Principal Investigators		Collaborators		Trainees (postdocs, PhD/MSc students)	Total
	Canada	Israel	LMIC	non-LMIC		
1. Neurosciences	5	5	6	0	1	17
2. Immunology	6	5	2	2	7	22
3. Cancer	6	5	5	0	4	20
4. Neurobiology	4	4	6	0	0	14
Total	21	19	19	2	12	73

G.2 Respondents' views on application process

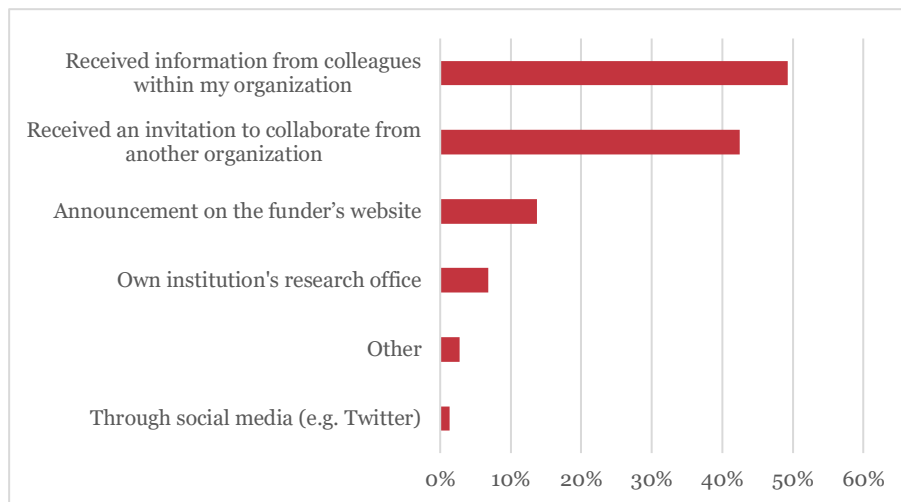
Figure 13 Extent of satisfaction of PIs with various aspects of the application process (n=40)



Source: Technopolis analysis of responses from all Canadian and Israeli PIs (Calls 1 to 4). Distribution of respondents by call can be found in Table 5.

Figure 13 above shows that at least 60% of Canadian and Israeli PIs were very satisfied with the scope of the Program and the amount of funding on offer. Overall, all the respondents were satisfied or very satisfied with the different aspects of the application process we asked them about. Among other aspects that PIs commented on were the application interface (n=4) and positive interaction with IDRC (n=2). The four individuals who commented on the application interface found it cumbersome and time-consuming. In particular, three Israeli PIs mentioned that they found the CV formatting too detailed and time-consuming.

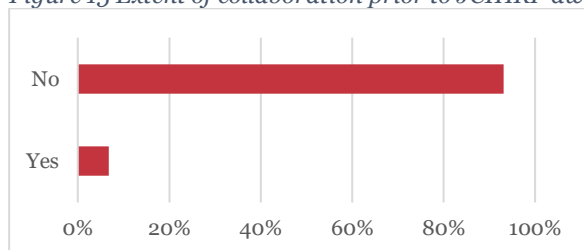
Figure 14 How respondents found out about Program (n=73)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5.

Respondents mentioned that they found out about the Program mainly through colleagues within their own organization (49%, Figure 14) or an invitation to collaborate (42%). Moreover, most (93%) of respondents had not collaborated with their JCIHRP project partners previously (Figure 15). Thus, a vast majority of the collaborations are new.

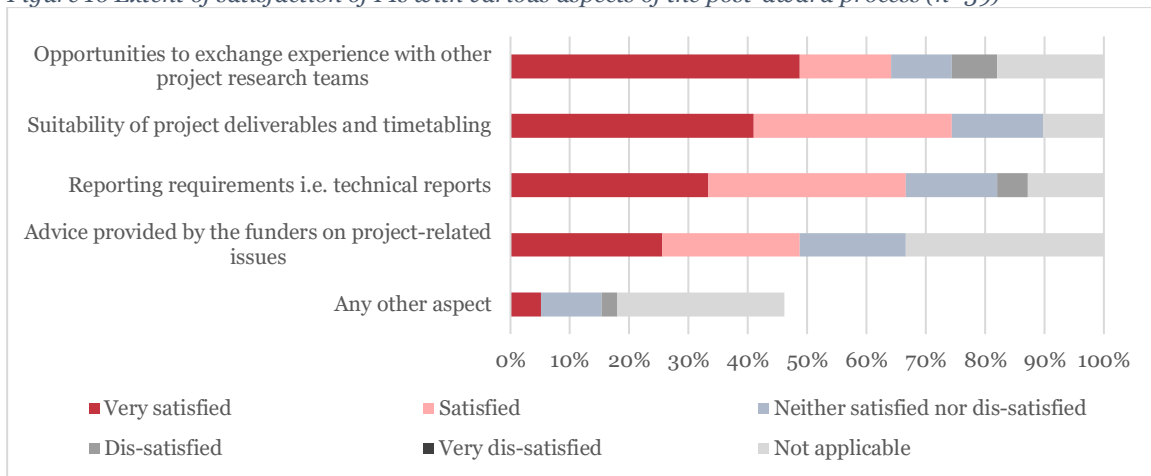
Figure 15 Extent of collaboration prior to JCIHRP award (n=73)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5.

G.3 Respondents' views on post-award processes

Figure 16 Extent of satisfaction of PIs with various aspects of the post-award process (n=39)



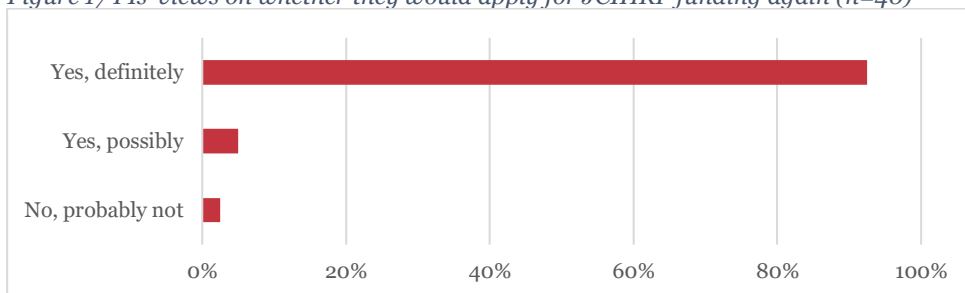
Source: Technopolis analysis of responses from all Canadian and Israeli PIs (Calls 1 to 4). Distribution of respondents by call can be found in Table 5. One Canadian PI from Call 4 did not respond to this question.

Canadian and Israeli PIs were also largely satisfied with post-award processes (at least 40% of respondents were satisfied or very satisfied with the post-award aspects highlighted, Figure 16). Other aspects highlighted (by 2 respondents each) were problems with LMIC collaborators, problems with transferring funds to LMICs and satisfaction with support and guidance from the IDRC.

G.4 Respondents' views on value of the Program

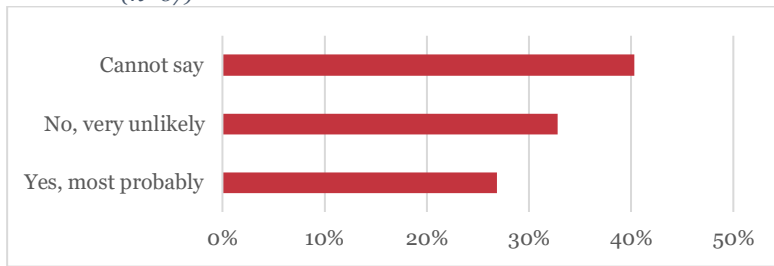
While Canadian and Israeli PIs were extremely positive about applying for JCIHRP funding again (Figure 17), only 33% of overall respondents (who answered the question) felt that their project would not have been funded if they had failed to get the JCIHRP award (Figure 18). About 27% of respondents felt that their would have most probably been funded anyway and 40% were not sure.

Figure 17 PIs' views on whether they would apply for JCIHRP funding again (n=40)



Source: Technopolis analysis of responses from all Canadian and Israeli PIs (Calls 1 to 4). Distribution of respondents by call can be found in Table 5.

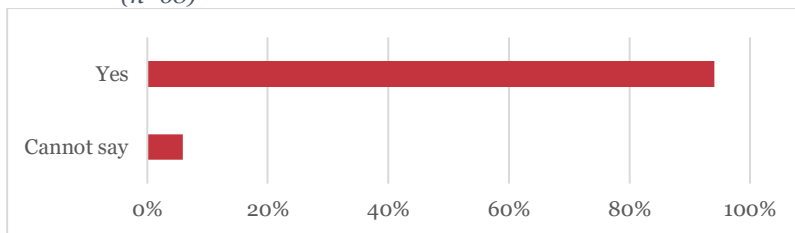
Figure 18 Respondents' views on whether the current project have been funded without the JCIHRP award (n=67)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5. One Canadian PI (Call 2), two trainees (Call 2) and three LMIC collaborators (two from Call 1 and one from Call 4) did not answer this question.

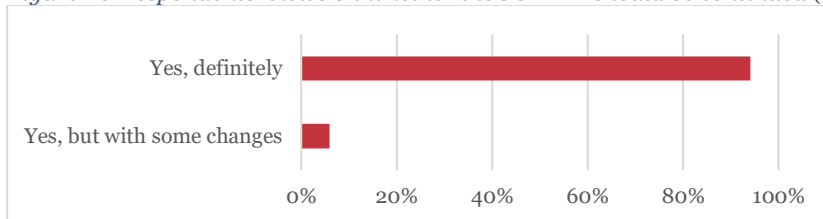
Moreover, a vast majority (94% of those who answered the question) felt that JCIHRP adds value above and beyond other funding opportunities (Figure 19) and all respondents thought that the Program should continue (Figure 20), albeit 6% felt that some changes are needed. Respondents' comments (36 out of 41 respondents who gave comments) showed that they particularly valued the international collaboration aspect, either with Canada or Israel, or with LMICs. Seven of the respondents felt that their collaborations and subsequent rich impacts would not have happened without the JCIHRP. Other aspects that individuals valued included the higher funding compared to what is available in Israel, similar programs not available in their country, establishment of new research networks and the international review panel.

Figure 19 Respondents' views on whether the JCIHRP adds value above and beyond other funding opportunities (n=68)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5. Two trainees (Call 2) and three LMIC collaborators (two from Call 1 and one from Call 4) did not answer this question.

Figure 20 Respondents' views on whether the JCIHRP should be continued (n=68)



Source: Technopolis analysis of responses from all survey respondents (Calls 1 to 4). Distribution of respondents by call, project role and geography can be found in Table 5. Two trainees (Call 2) and three LMIC collaborators (two from Call 1 and one from Call 4) did not answer this question.

G.5 Respondents' views on outcomes from projects

As projects funded under Call 4 (Neurobiology) have just started, we disregarded responses from respondents who belong to this call as we felt that it is too early for them to comment on outcomes.

However, our survey analysis (Figure 21) shows that respondents from calls 1 to 3 strongly agree (at least 60% of respondents) that their projects met the expected outcomes such as advancing biomedical research and discovery, strengthened research capacity, development and strengthening of collaborations and professional development of individuals. However, wider research capacity strengthening in the host institution i.e. outside the direct project team appears to have happened to a much lesser extent.

Figure 21 Respondents' views on project outcomes (Call 1 to 3 only, n=59)



Source: Technopolis analysis of responses from all Call 1 to 3 survey respondents. Distribution of respondents by call, role and geography can be found in Table 5.

These views were reinforced in survey responses to a question asking about the projects' direct outcomes (Figure 22). Over 50% of respondents reported that strengthening of international research partnerships; cross-continental exchange of knowledge, skills and people; expansion of professional networks and career development; trainee skills development and elucidation of basic biological mechanisms had been achieved to a large extent. Importantly, at least 67% of respondents said that all expected outcomes had been delivered to some extent. A fifth of the respondent population reported that development of infrastructure had not happened in their project.

Figure 22 Extent to which different project outcomes have been achieved (Call 1 to 3 only, n=59)



Source: Technopolis analysis of responses from all Call 1 to 3 survey respondents. Distribution of respondents by call, role and geography can be found in Table 5.

G.6 Respondents’ reporting of outputs from projects

As projects funded under Call 4 (Neurobiology) have just started, we believe that they will not have any outputs yet. Moreover, it is too early for them to have realistic planned outputs. Hence, their responses were excluded from this analysis. Table 6 shows the quantification of different outputs as reported by the survey respondents for Calls 1 to 3.

These data should be interpreted with caution because of self-reporting by respondents who may have under- or over-estimated their outputs or indeed misunderstood the question. Moreover, while we asked individuals about their own outputs, it was not possible to aggregate output numbers across all respondents as this would have resulted in some double counting. For instance, a co-publication could be cited as an output by each author and on aggregation would appear as two outputs rather than one.

Overall, we can say that projects are producing outputs that would be expected based on the objectives and scope of the Program. 49% of respondents report at least one research paper and 64% have delivered at least one conference abstract or presentation. On average, projects from Call 1 (Neurosciences), 2 (Immunology) and 3 (Cancer) reported 3, 2 and 1 publications respectively assuming that the highest number of publications reported for a project by one respondent includes all individual and joint publications³⁴. Note that this conservative approach might mean that we underestimate the total number of publications.

In addition, we see evidence of collaboration and capacity building with over 50% of respondents stating that they visited their partners’ labs and gave a seminar or talk there. Canadian and Israeli PIs and LMIC collaborators (excluding students and postdocs) supervised on average 3.6 MSc/PhD students and 2.4 postdoctoral fellows, with women comprising about 60% of these trainees. Moreover, on average 2.7 LMIC researchers are being supervised and trained by the PIs and LMIC collaborators.

There is also evidence of new collaborations emerging from the JCIHRP projects either with the JCIHRP academic partners (44% of responses) or non-academic partners (17% of responses). Technological innovation is also occurring with 6 patent applications reported as being granted or filed from 5 projects as well as other outputs such as protocols, technical notes and clinical trials. However, only 19% of

³⁴ To avoid double counting the same publication and assuming that most research publications produced from a project will be co-publications, we opted for using the highest number of publications reported for a project by one respondent rather than the total number of publications reported for a project by all respondent partners. We assume that the larger number would include all co-publications as well as individual publications.

respondents mentioned such outputs. Except for one patent that was reported to be in the process of being filed, the attribution of the other patents to the JCIHRP is questionable (see Section 7.1 for a full explanation).

Table 6 Quantification of actual and planned project outputs based on survey responses (Calls 1 to 3 only)

	Actual outputs				Planned outputs			
	% of respondents/projects citing at least one of this output	Total number of output	Average (by n)	Maximum individual value reported	% of respondents/projects citing at least one of this output	Total number of output	Average (by n)	Maximum individual value reported
Number of research papers per project ³⁵ (n=18)	94%	37	2.1	8	94%	55	3.2	10
Number of research papers per respondent (n=59)	49%	60	1.0	8	75%	109	1.8	10
Number of research papers per LMIC respondent (n=18)	22%	8	0.4	3	67%	24	1.3	5
Number of conference or meeting abstracts and presentations per respondent (n=59)	64%	209	3.5	30	73%	201	3.4	36
Number of conference or meeting abstracts and presentations per LMIC respondent (n=18)	33%	19	1.1	6	72%	32	1.8	10
Number of knowledge exchange events attended per respondent (n=59)	71%	227	3.8	30	64%	147	2.5	24
Number of knowledge exchange events attended per LMIC respondent (n=18)	44%	14	0.8	3	61%	23	1.3	4
Number of research visits made to partners' labs per respondent (n=59)	54%	73	1.2	12	63%	65	1.1	5
Number of research visits made to partners' labs per LMIC respondent (n=18)	33%	11	0.6	3	61%	16	0.9	4
Number of seminars/talks given at partners' institutions per respondent (n=59)	53%	78	1.3	21	63%	72	1.2	6
Number of seminars/talks given at partners' institutions per LMIC respondent (n=18)	33%	11	0.6	4	61%	24	1.3	6
Number of awards and prizes per respondent (n=59)	20%	34	0.6	8	20%	14	0.2	2
Number of MSc and PhD students per PI/LMIC collaborator ³⁶ (n=43)	64%	136	3.6	10	46%	89	3.3	10

³⁵ For these calculations, we used the highest number of papers reported by a respondent for a project assuming that most research papers are co-publications and thus the larger number includes all the publications reported by other project partners who responded to the survey. This is a conservative estimate of publications to avoid double-counting.

³⁶ Here LMIC collaborators represent those who are PIs in their own right. Those from LMICs that stated they were postdocs or students have been excluded from this analysis

Number of postdoctoral researchers per PI/LMIC collaborator ³⁷ (n=43)	59%	85	2.4	5	39%	48	2.1	5
Number of women trainees (students and postdocs) per PI/LMIC collaborator ³⁷ (n=43)	68%	143	3.6	9	47%	93	3.3	9
Number of LMIC researchers (including students) per PI/LMIC collaborator ³⁷ (n=43)	44%	70.5	2.7	16	29%	35.5	2.1	6
Number of new projects (not funded by the JCIHRP) with academic collaborators or institutions involved in the JCIHRP project per respondent (n=59)	44%	39	0.7	3	47%	39	0.7	3
Number of new projects (not funded by the JCIHRP) with academic collaborators or institutions involved in the JCIHRP project per project ³⁸ (n=18)	78%	24	1.3	3	89%	26	1.4	3
Number of new projects/partnerships with non-academic partners as a result of the JCIHRP project per respondent (n=59)	17%	22	0.4	11	27%	20	0.3	3
Number of new projects/partnerships with non-academic partners as a result of the JCIHRP project per project ³⁸ (n=18)	56%	22	1.2	11	61%	15	0.8	3
Number of other outputs eg technical notes, protocols and patents per respondent (n=59)	19%	31	0.5	9	17%	16	0.3	3
Number of other outputs eg technical notes, protocols and patents per project ³⁸ (n=18)	56%	29	1.6	9	39%	13	1.9	3

³⁷ Here LMIC collaborators represent those who are PIs in their own right. Those from LMICs that stated they were postdocs or students have been excluded from this analysis

³⁸ To avoid double counting the same output, we used the highest number reported for a project by one respondent assuming that most of the outputs cited are jointly produced and hence the larger number includes all the outputs reported by other respondents for the same project. This is thus a conservative estimate of the numbers produced.

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