PHSA Research Metrics

7th Annual Report

Fiscal Year 2014-15

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Acknowledgement

The following report is prepared for the Provincial Health Services Authority (PHSA) Board of Directors on an annual basis to present data related to the Framework for PHSA Research Metrics (see Appendix 2). As an academic health sciences organization, PHSA works in close partnership with the University of British Columbia and other academic partners, including Simon Fraser University, University of Victoria, and University of Northern BC.

The research activities described in this report are made possible only through the collaboration and partnership of PHSA, its agencies and research entities, and its academic partners.

PHSA Research Metrics Fiscal Year Summary – PHSA Overall

Indicator		Key Measure Description	FY 2012-13 Value	FY 2013-14 Value	FY 2014-15 Value
Producing & Advancing Knowledge	1a	**Total Annual Grant Awards by Type (excluding Major* CFI Infrastructure grants for FY 12/13 & 13/14 only)**	**$126,703,056**	**$141,001,291**	**$131,838,156**
		Salary Awards	12,652,088	10,887,936	**12,751,039**
		Infrastructure Awards*	4,689,873	2,755,351	**16,675,937**
		Operating Grants	100,064,997	121,878,768	**98,107,211**
		Other	9,296,098	5,479,236	**4,303,969**
		Total Annual Grant Awards including Major CFI Infrastructure grants	**128,100,775**	**142,381,426**	**131,838,156**
	1b	**Total Annual Grant Awards by RISe Sector (excluding Major* CFI infrastructure grants for FY 12/13 & 13/14 only)**			
		Government	64,617,326	66,101,747	67,395,627
		Non-Profit	50,226,591	62,575,175	48,906,960
		Industry	11,859,140	12,324,370	15,535,569
	1c	Annual Grant Application Success Rate – CIHR March Competition – PHSA Overall/Nat'l Rate	27.3%/20.1%	31.3%/20.1%	21.3%/17.7%
	1c	Annual Grant Application Success Rate – CIHR Sept Competition – PHSA Overall/Nat'l Rate	24.5%/20.8%	22.2%/19.0%	N/A
	1d	Total # of Publications with Agency Author			
		CFRI	631	694	679
		BCCA	429	826	524
		WHRI	324	300	328
		BCCDC	146	190	227
		BCMHSUS	68	70	83
Building Research Capacity	2a	Total # of Research Trainees	1,178	1,279	1,232
	2c	Total # of Researchers (excluding Category 4 – Affiliate Investigator Category)	650.5	696.5	724.5
		Category 4 – Affiliate Investigator	44.5	39	40
	2d	Infrastructure Investment – Major CFI Infrastructure Grants	$1,397,719	$1,380,135	See Note Below
	2e	Indirect Costs Program Grants (Tri-Council only)	$3,445,518	$3,793,358	$4,057,550
Achieving Economic Benefits & Innovation (BCCA, CFRI & BCCDC only)	3a	# of Invention disclosures	55	52	60
		# of Provisional Patent applications filed	21	22	29
		# of PCT applications filed	8	5	7
		# of Patents Filed/Issued	43/4	23/6	41/9
	3b	# Active License Agreements	132	146	159
		# of Spin-off Companies	10	10	9
		IP related revenue – Realized Revenue			
		BCCA	$89,089.14	$93,506.53	$174,696.69
		CFRI	$71,896.00	$55,375.00	$28,758.00
Advancing Health & Policy Benefits	4a	**Clinical Trials** (including Non-PHSA PIs utilizing PHSA facilities and resources)			
		# active trials at the end of the FY	499	529	551
		Cumulative Subject Enrollment at end of FY	30,069	32,511	63,146
	4b,c,d	**Registries as Research Resources**			
		# of Research Requests/Approvals	142/132	196/110	216/204

*see definition of Major CFI grants in Glossary – Appendix 4; only applies to FY's 12/13 and 13/14

Note: As of 2014/15, Major CFI awards are included in total annual grant awards and can no longer be separated out due to changes in source data.

Executive Summary

This is the seventh annual Research Metrics Report, based on the Framework for PHSA Research Metrics previously approved by the PHSA Research Committee (see Appendix 2, pg. 75). All previously reported qualitative and quantitative metrics have been updated to include data for FY 2014-15 in the Framework's four categories; **Producing & Advancing Knowledge**, **Building Research Capacity**, **Achieving Economic Benefits & Innovation**, and **Advancing Health & Policy Benefits**.

The results for each metric are provided in a one page snapshot utilizing combined information from each participating PHSA research entity. These include Child & Family Research Institute (CFRI), British Columbia Cancer Agency (BCCA), Women's Health Research Institute (WHRI), BC Mental Health and Substance Use Services (BCMHSUS) in collaboration with researchers from the BC Mental Health & Addictions Research Institute, British Columbia Centre for Disease Control/UBC Centre for Disease Control (BCCDC/UBC CDC), and BC Emergency Health Services (BCEHS). Given its relatively low level of research activity attributable to PHSA investigators, BCEHS is not reported in a separate agency section. While there are a number of researchers associated with the BC Renal Agency, Cardiac Services BC, and BC Transplant, they conduct their research under the auspices of the academic affiliation they hold. As such, research activities are not attributed directly to these PHSA agencies and they are accordingly not captured in this report with the exception of information related to their associated data registries. In April of 2015, the BC Mental Health & Addictions Research Institute and CFRI formally joined together. In future reports, CFRI activities will represent the combined efforts of these two research entities. BC Mental Health & Substance Use Services will continue to report on research activity occurring within its programs (e.g. Forensics).

A new methodology for collecting award data was utilized beginning this fiscal year. With the increased adoption of RISe by all PHSA research entities, and an improvement in data quality, PHSA is now reporting data utilizing RISe as the main source of award information. In past years, data was provided by the agencies using a PHSA developed data collection tool and used various sources (RISe, PHSA Finance, and Agency data) using the PHSA established and defined funding type, source, and category classifications. These classifications were agreed upon by the initial PHSA Research Metrics Working Group and refined each year. The process differed this year in that RISe data was accepted as the source of truth for the assignment of awards into the funding type, source and category designations. Although there were some data inaccuracies, it was felt use of the data would provide a strong impetus to continue improving data quality and processes while reducing duplication of effort. In addition, this provides a higher level of granularity (depth of a data measure) and the ability to report additional metrics by researcher (see Table 1, pg.14) leading to a more complete picture of the research activities of each agency.

As seen on the PHSA Overall Summary Page, numbers of researchers, researcher trainees, publications, clinical trials, intellectual property metrics and registry access metrics have all increased from FY 2013-14 levels. Total annual grant awards ($131,838,156), however, have experienced a decrease of 7.4% or $10.5M. Operating Grants make up the majority of this decline, with a total of $23.7M or 20% reduction from FY 2013-14 levels. FY 2013-14 had the largest single year increase since the report's inception and was due to two large operating grant awards for one BCCA researcher. When compared with historical totals, operating grant funding levels have remained relatively stable since FY 2010-11. The differentiation between Major and Minor CFI Infrastructure grants and Human Resource grants will not be made going forward due this information not being captured in RISe.

The total amount of the Indirect Costs Program (ICP) grant for FY 2014-15 for all PHSA agencies combined was $4,057,550. This amount is not reported as part of total research funding in this report but is included here as UBC reports this figure to align with the CAUBO (Canadian Association of University Business Officers) policies.

PHSA research entities continue to perform well in comparison with national peers in the March Canadian Institutes of Health Research (CIHR) competition. PHSA's success rate has well surpassed the national average. The total number of CIHR applications for the March operating competitions increased from 63 to 80, which resulted in an increase in approved applications over last FY (17 vs. 15). CIHR phased out the Open Operating Program (OOP) and replaced it with the Foundation and Project Scheme competitions in the Fall of 2014. This resulted in researchers submitting multiple applications to the OOP in March of 2014 and explains the increase in the number of applications. CIHR has significantly changed its core research funding scheme and impact of these changes on external funding levels will be closely monitored. These competitions represent only a small portion of grant applications but are reported as a good measure that is consistent across agencies and can be compared to a national rate.

Beginning in FY 2014-15, PHSA utilized a new methodology for collecting and reporting publications, a widely used measure of the impact of research, in order to bring more consistency to publication data reporting between PHSA research entities. Through an affiliation with UBC, agencies were able to utilize SciVal, a web-based bibliometric tracking tool. SciVal is a product of Elsevier, which specializes in web-based digital solutions with roots in publishing scientific, medical and technical literature. While SciVal is a data extraction tool, the source of its data is Scopus, the largest abstract & citation database of peer-reviewed literature, scientific journals, books and conference proceedings. Challenges in data collection remain, due to the lack of a unique identifier for each researcher. As in previous years, data relied on researcher name as a means of identifying citations. This has proven to be a time consuming and error prone method given the great variability in which names appear in citations. To overcome this challenge, UBC is encouraging its researchers to register for an ORCID ID (Open Researcher & Contributor ID), a persistent digital identifier and an international standard. This identifier would alleviate the ambiguity problem in scholarly output data collection and result in more accurate statistics. Individual investigators may register for free while organizations wanting to undertake mass registration for their members require membership in ORCID (approximately $10,000 USD per year). Until all researchers utilize a unique identifier, it will continue to be a challenge to systematically identify intellectual outputs produced by PHSA researchers.

The total number of publications reported for FY 2014-15 represents the agency total for publications where agency researchers were authors of the study. When researchers from more than one research entity/agency collaborate on one publication, it is counted once for each agency. Hence, an aggregate total PHSA number is not available.

For a sixth year, reporting related to Indicator 3: Achieving Economic Benefits and Innovation captured numbers of intellectual property (IP) disclosures and patents at the BC Cancer Agency, CFRI and BCCDC. Data across PHSA agencies remained relatively stable. Of note this year is the inclusion of BCCDC IP activity in the BCCA reported section. This is due to the fact that patents were assigned to BCCA for the Chlamydia vaccine.

For Indicator 4: Advancing Health and Policy Benefits data was collected utilizing two separate survey instruments in FY 2014-15. Interest in creating a more systemic approach to research impact collection, and combining efforts to reduce the call for repetitive data, lead to a collaboration with UBC Faculty of Medicine for BCCA researchers. UBC's Faculty of Medicine developed a survey based on a logic model evaluating both academic and socio-economic impacts of research. This survey was beta tested with BCCA and feedback from this process will inform future collection of outcomes/research impacts. The response rate was low, with only 48 of 239 surveys completed and thus results are not reported here. Prior to the next edition of the PHSA Metrics report we will re-assess the UBC survey method of data collection and decide how the response rate could be improved or continue with survey methods similar to the other agencies.

The remaining agencies were issued a survey asking respondents to identify any guideline, drug, diagnostic agent or device adopted or approved in FY 2014-15 as a result of research driven by PHSA researchers, or collaborative research in which PHSA researchers were key participants, as well as the benefits resulting from those initiatives. An addition to the survey this year was an attempt to classify the stated benefits into two categories (Patient or System Benefit) to more fully summarize the responses. The majority of benefits submitted fell into the Patient type. The top three sub-types included Protocols and guidelines (30), Access to new treatment/technology (15), and Improvements in timely access to care (6). The top System benefit was Knowledge dissemination/New policy. The type of benefit can be found in the third column of the table after each agency section. A key finding for each agency is presented in summary form in the PHSA overall section, with detailed submissions included in the respective agency sections. While not intended to be an exhaustive listing, this year's submissions highlight some of the key products resulting from PHSA research that are improving outcomes and system sustainability.

For a second year, all PHSA registries participated in the Registries as Research Resources survey. Information provided this year reveals how the registries contribute data to national, pan-Canadian and international datasets to support large scale research studies. The benefits of research undertaken from data in the registries have also been classified this year into two broad category types of patient and system benefits with results being split evenly between Patient and System benefits. The dominant patient benefit type was "Protocols and guidelines", and the dominant system benefit was "Efficiency, cost/benefits or sustainability".

Clinical trial data is reported using the same methodology as last year and includes principal investigators (PIs) who utilize PHSA facilities and resources but are not formally affiliated with a PHSA research institute and PHSA PIs who utilize a non-PHSA ethics board (UBC's Clinical Research Ethics Board and Behavioral Research Ethics Board). There is a large increase in

reported cumulative subject enrollment due mainly to one study (CLIP-Community Level Interventions for Pre-eclampsia) which enrolled 27,000 patients in FY 2014-15.

Although the data presented in this report provide trending and, in some instances, comparative information, efforts have been made to portray each reporting entity uniquely, to accurately reflect their very different and unique natures. Presented together, they portray the range and depth of research activity associated with PHSA. The unique natures of the research entities result in some variability in the availability and detail of some metrics.

To better understand the metrics reported, it is helpful to refer to the glossary and definitions document (see Appendix 4, pg. 77) that guided data collection.

The following report was prepared with the assistance of the Research Metrics working group comprising representatives of each of the PHSA research entities and PHSA Performance Measurement and Reporting (see Appendix 3, pg.76). The individuals within this group worked extremely hard to develop consistent definitions and approaches to collecting data which has further strengthened the consistency and clarity of the collected metrics and their efforts are greatly appreciated. The ability to report on all metrics included in the PHSA's research metrics framework is an iterative process and metrics will continue to be refined further in future reports.

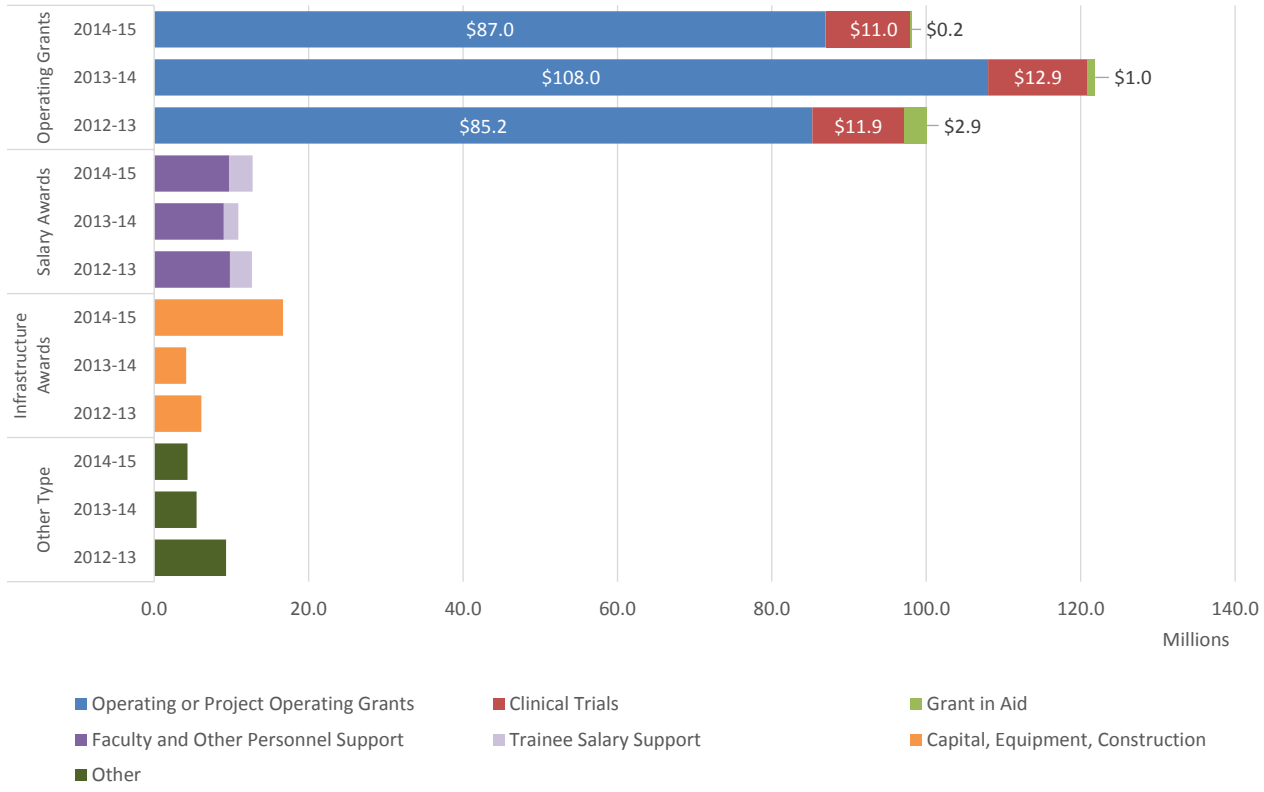
PHSA Aggregate Analysis

Producing and Advancing Knowledge

In FY 2014 -15, researchers affiliated with PHSA were awarded a total of $131,838,156, a 7.4% reduction in total awards from FY 2013-14, but consistent with historical totals. Operating Grants ($98,107,211) continued to make up the largest portion (74.4%) of total funding received. Operating grants support specific, time-limited research projects. While operating grants are the "bread and butter" of research grants, salary awards are important to provide researchers with the protected time to successfully compete for operating grants.

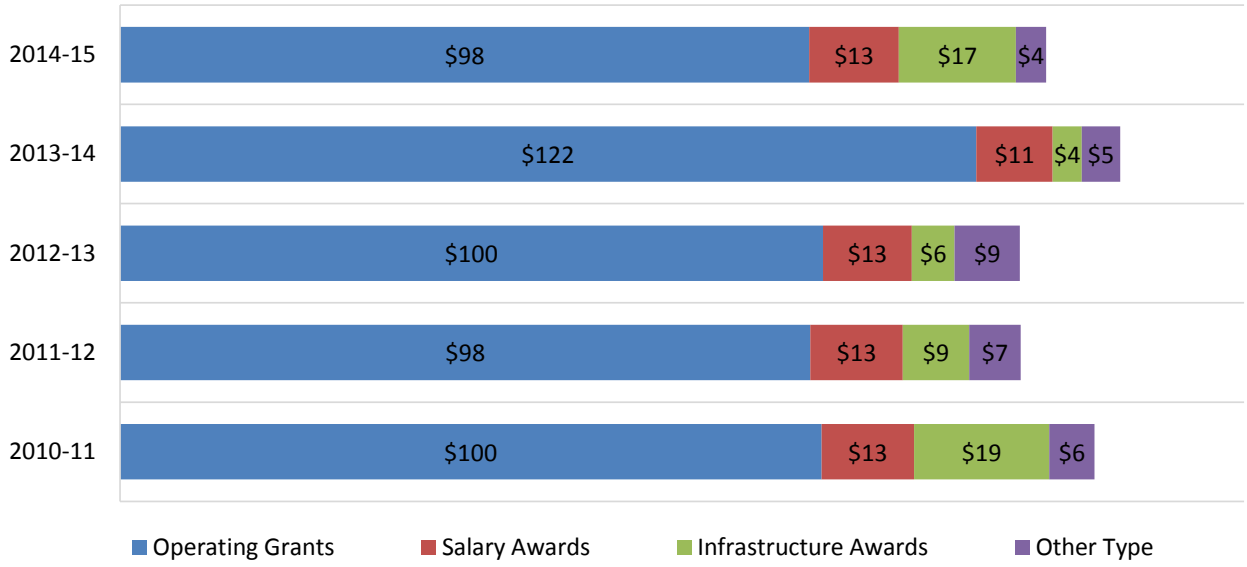
A breakdown of funding types and subtypes by fiscal year can be found in Figure 1. For FY 2014-15, the subtypes of Operating or Project Operating Grants, and **Infrastructure Awards** garnered the largest portion of research funding in their respective type categories. Clinical Trials funding, from FY 2012-13 – FY 2014-15 remained relatively stable. Infrastructure awards saw a large increase in FY 2014-15 due to a single award for a BCCA researcher totaling more than $11.2M. With the adoption of the RISe funding types, details on sub-types (i.e. Donations & Endowed Interest) are now categorized into the **Other** category.

Figure 1
Total PHSA Research Funding by Funding Type and Sub-Type by Fiscal Year



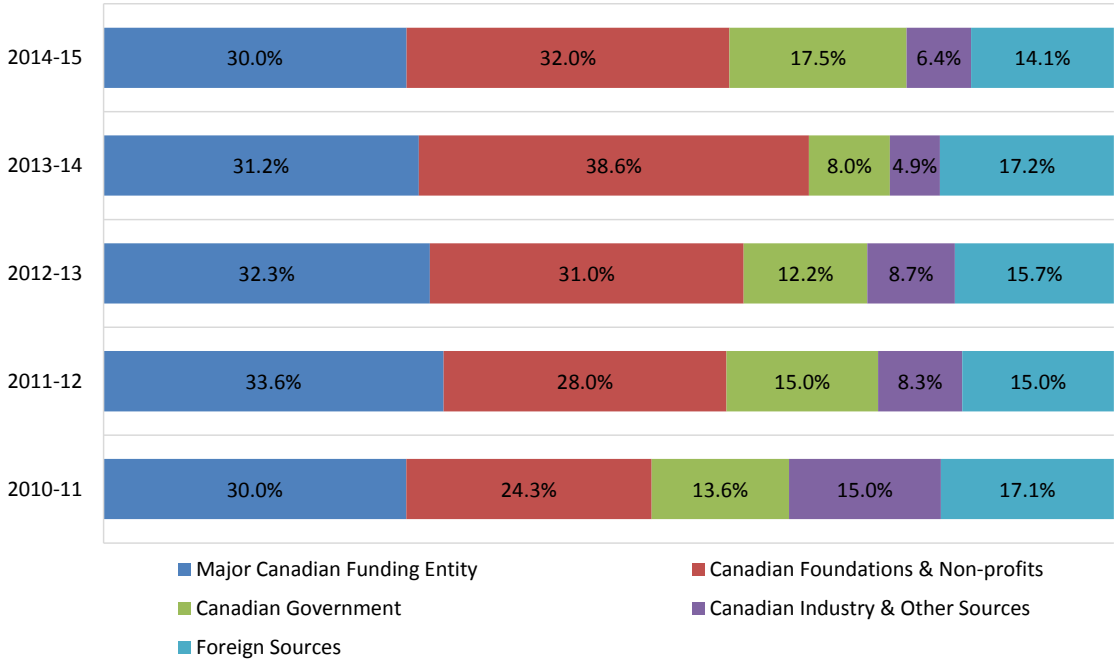
Indirect Costs Program grants total $4,057,550, up $264,192 over FY 2013-14, and represents funding to support the indirect costs of research for tri-council awards, but is not included in total research funding or the figures below. Due to the fact that research support is a shared expense between UBC and PHSA research agencies, PHSA has negotiated to receive 66% of the applicable UBC ICP grant. Figure 2 shows Total Research Funding by Fiscal Year and Type for the past five fiscal years. The mix of funding types is relatively stable for FY 2014-15 when compared to historical levels, with 2013-14 being an anomaly.

Figure 2
Total PHSA Research Funding by Fiscal Year and Type



A comparison of funding source by source category over five (5) fiscal years can be found in Figure 3. This figure, generated by compiling hundreds of potential sources into five categories, highlights the extent to which primary sources of funding vary from year to year. Of note is the increase in Canadian Government funding (green) and the corresponding decrease in Canadian Foundations & Non-profits (red). Foreign Sources (light blue) account for the lowest percentage in five years. Major Canadian Funding entities include CIHR, NSERC, SSHRC, MSFHR and Genome Canada & Provincial Agencies.

Figure 3
Percentage of PHSA Research Funding by Funding Source Category by Fiscal Year



In addition to the above, Figures 4 and 5 shows the same award data by RISe sector (see glossary, pg. 80, for sector definition) both by fiscal year and by agency for five fiscal years. Of note on the FY chart, is the reverse in the downward trend of awards by Government (blue). Also of note is the corresponding decrease in Non-profit (red), one of the largest funding sector for all PHSA agencies. Industry funding is the highest it has been since FY 2010-11.

Figure 4
Percentage of PHSA Research Funding by RISe Sector and Fiscal Year

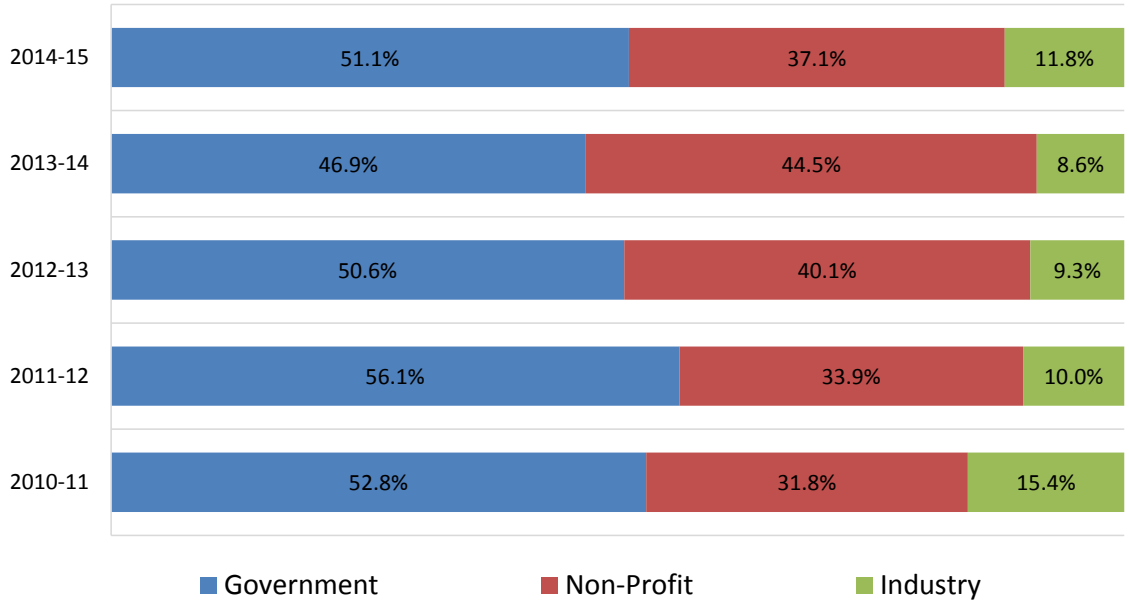
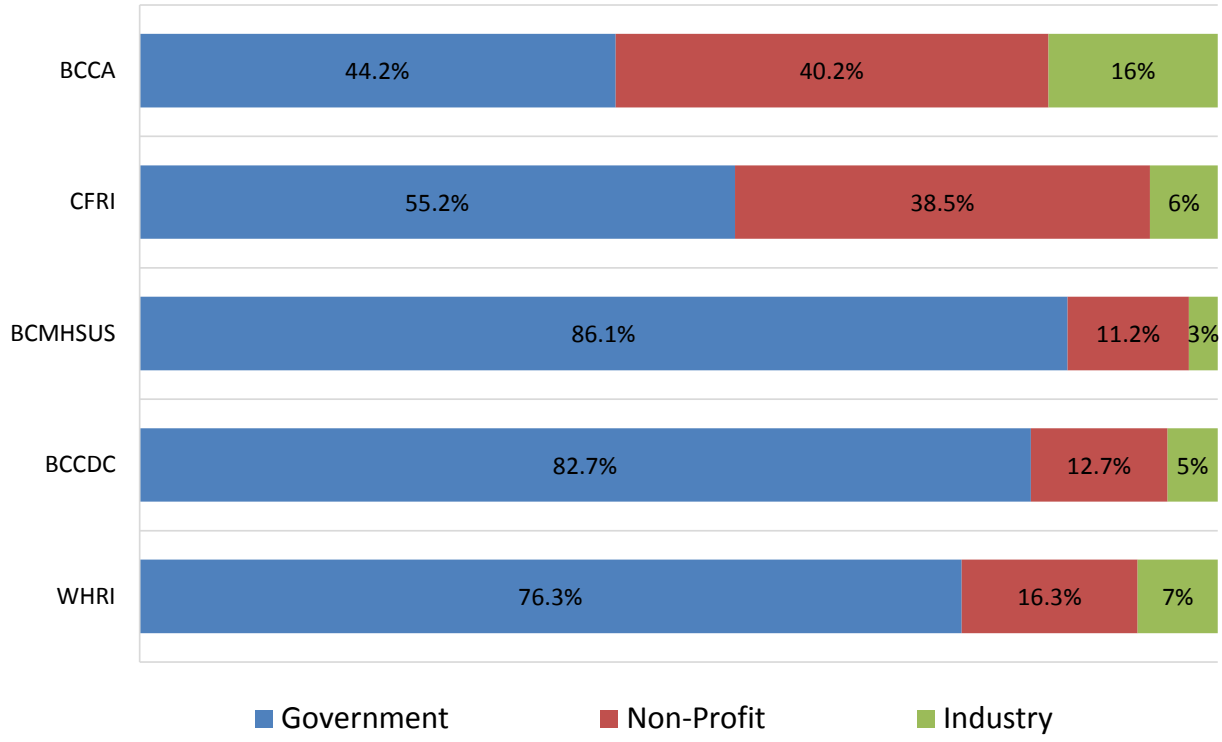


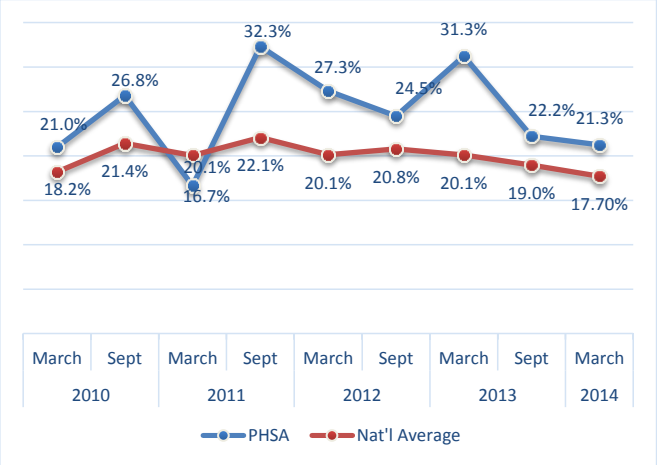
Figure 5 shows the percentage of funding by RISe sector and agency for FY 2014-15. This graph reflects the variations in funding sources for all of PHSA research entities, as BCMHSUS, BCCDC and WHRI rely heavily on government funding.

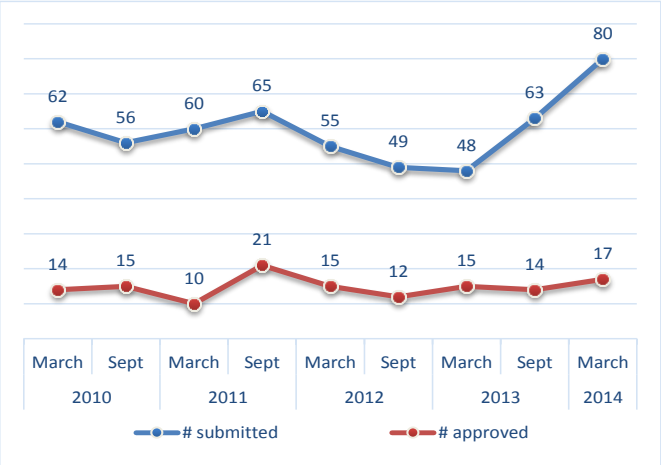
Figure 5
Percentage of PHSA Research Funding by RISe Sector and Agency



CIHR had only one competition this year in March of 2014. PHSA researchers have achieved positive success rates and are above the national average. Figure 6 below shows the overall success rates based on revised competition results for the last five calendar years (which occur in instances when, after the initial funding announcement, one of the CIHR Institutes decides to support highly ranked applications that have just missed the cut-off by providing a bridging award) for research entities across PHSA. National success rates are presented for comparison. Also shown is the total number of applications submitted and approved by PHSA agencies.

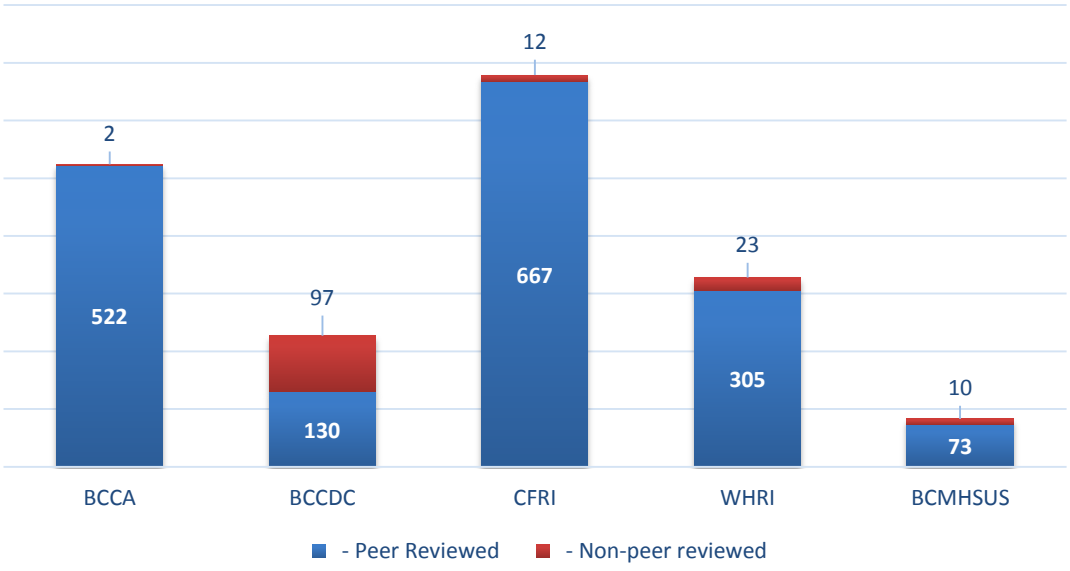
Figure 6
PHSA CIHR Application Success Rate and Number of Applications Submitted/Approved





As indicated in the executive summary, statistics for publications were collected utilizing SciVal with Scopus as the source. Publications were collected in the categories of books, book chapters, peer-reviewed publications inclusive of published journal articles, case reports, essays, literature reviews, and reports produced for government. See Figure 7 for a breakdown of total publications by agency and category. Totals are reported by fiscal year for WHRI and by calendar year for BCCA, CFRI, BCMHSUS and BCCDC. A breakdown by types is shown in the agency specific sections due to low sample size.

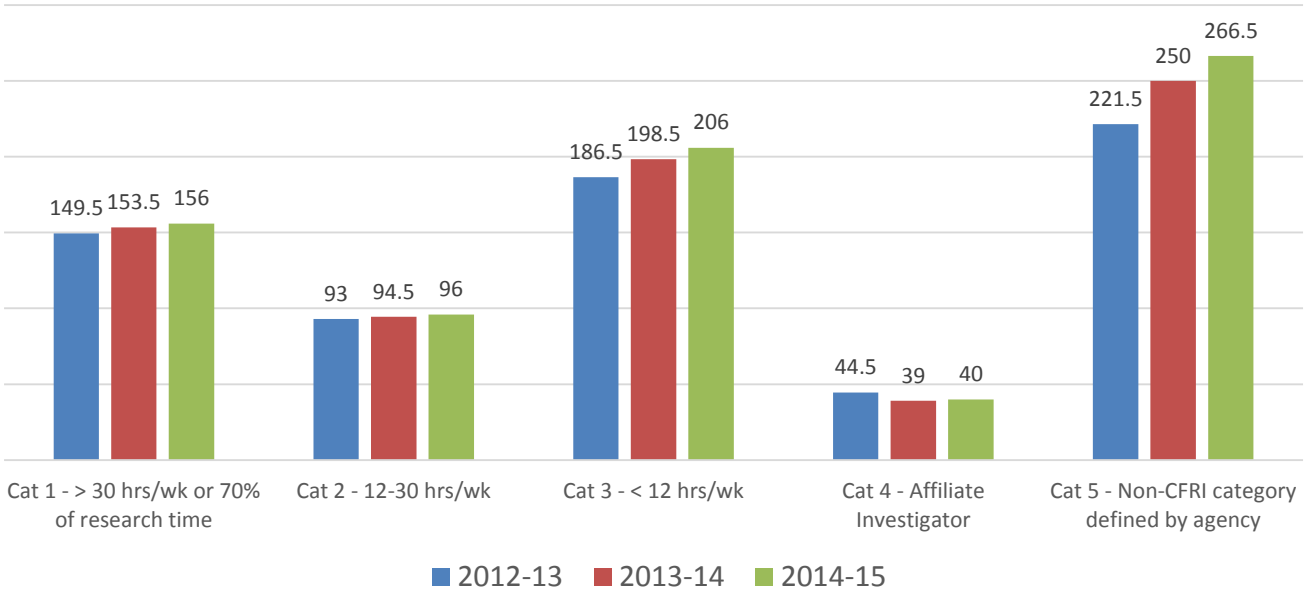
Figure 7
Total Number of Publications by Agency and Category



Building Research Capacity

PHSA research entities identified 724.5 researchers in categories 1 – 3 and 5 in FY 2014-15, up 28 from FY 2013-14 (see Figure 8). This increase is due mostly to consistently reporting researchers who are shared with agencies outside PHSA as a 1 instead of .5. Category 4 researchers are defined as Affiliate Investigators and represent those researchers with a primary affiliation with a research or academic institution external to PHSA, but who wish to remain collaborators with PHSA researchers. Category 4 researchers totaled 40, up 1 from FY 2013-14. PHSA does not track category 4 members funding, publications or trainees. BCCA, BCMHSUS and CFRI are able to report their researchers utilizing CFRI definitional categories, which highlight the amount of time protected for research purposes. BCCDC and WHRI define researchers utilizing a methodology that best reflects the type of work and relationships they have with their researchers. Further information on these methods can be found in specific agency sections. An attempt to count each researcher only once was made by attributing each researcher to the entity where the bulk of salary and/or support are received. Category 1 researchers are best positioned to compete for external grants.

Figure 8
Total Number of PHSA Researchers by Category and FY



As indicated in the executive summary, because all agencies now use RISe to a greater extent than in previous years, PHSA is now able to utilize the data at the highest level of granularity available. Granularity is the level of depth represented by data in a table. This has allowed for summary of data at the researcher or Principal Investigator (PI) level as opposed to the funding source level in previous years. For the first time, Table 1 provides summary statistics by agency at the PI level. PHSA received funding for 362 Principal Investigators collaborating with 1,299 UBC co-investigators for 1,345 unique studies in FY 2014-15. This excludes Salary and Other award types as these are not designated for specific studies and the number of co-investigators from other academic institutions.

Table 1
Number of Funded Studies, PI's, UBC Co-PI's and Award Amount by Agency

Agency	# of Unique Studies	# of Unique PI's by Agency	# of UBC Co-PIs by Agency	Total Award Amount
BCCA	**706**	**169**	**559**	**71,392,514**
BCCDC	**30**	**21**	**36**	**2,376,395**
BCMHSUS	**21**	**9**	**21**	**2,087,451**
CFRI	**568**	**155**	**647**	**37,082,453**
WHRI	**20**	**8**	**36**	**1,843,836**
Grand Total	**1,345**	**362**	**1,299**	**114,782,649**

During FY 2014-15, PHSA researchers provided training and supervision to a total of 1,232 research trainees, a decrease of 47 from FY 2013-14. This is a significant metric because the training of Post-doctoral fellows (PDFs), Doctoral, and Masters Trainees in particular is a major indicator of the degree to which PHSA and its research entities are supporting their academic mandate and ensuring the next generation of highly qualified research personnel. In addition, Post-doctoral fellows and Doctorals contribute significantly to the conduct of research under the supervision of principal investigators. See Figure 9 and 10 for the number of trainees by type and fiscal year for PHSA overall.

Figure 9
Total Number of PHSA Trainees by Fiscal Year

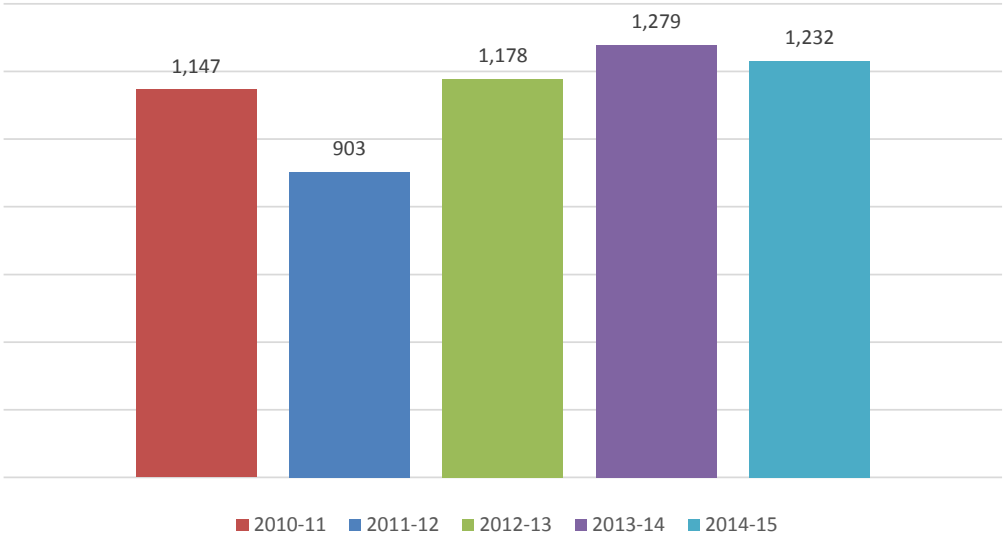
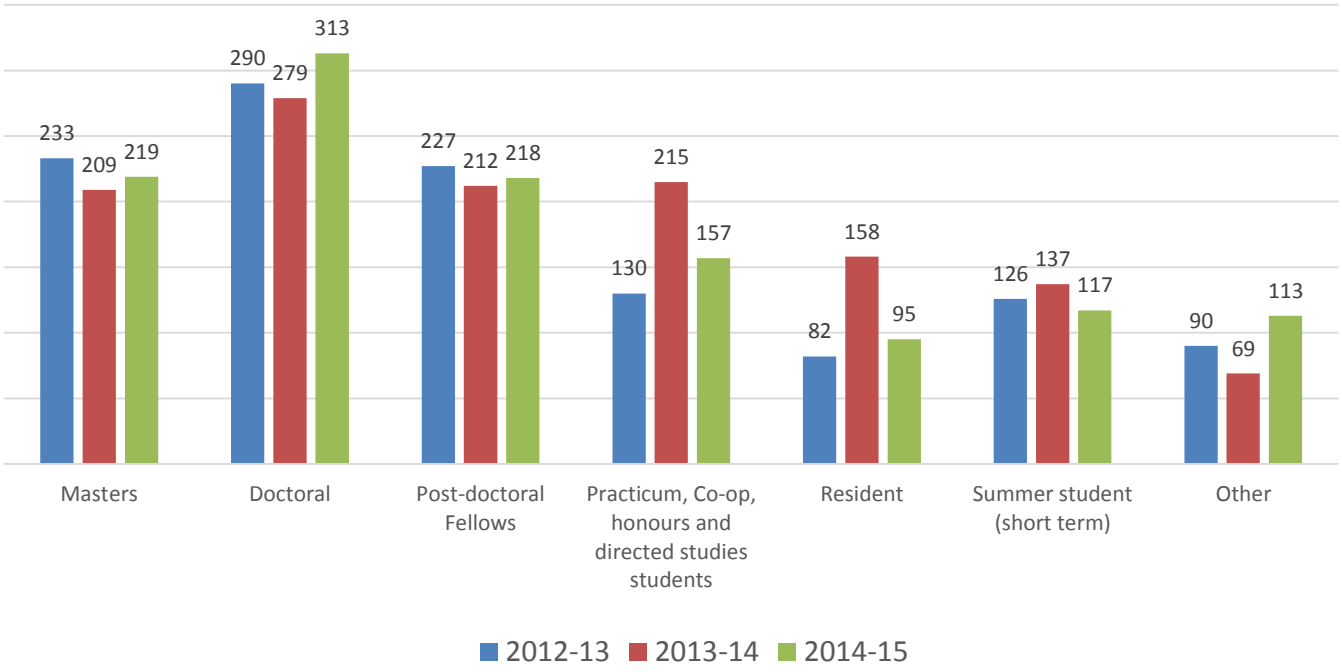


Figure 10
Total Number of PHSA Trainees by Type by Fiscal Year



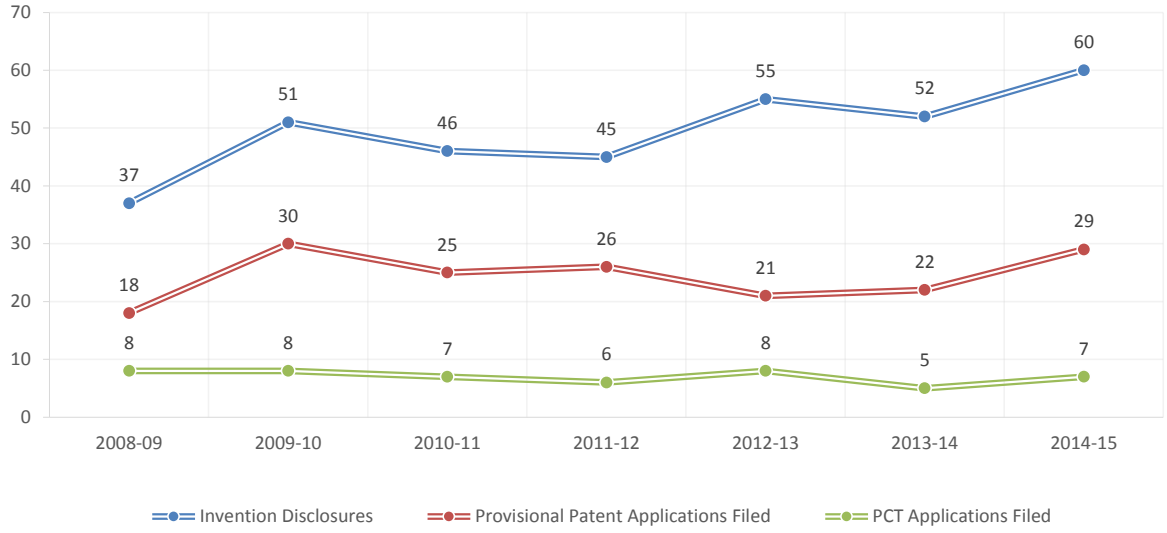
Achieving Economic Benefits and Innovation

The patent process, along with data on licensing and spin-off companies, is provided to measure the commercialization of discoveries, and other economic benefits resulting from these discoveries. Data are included for BCCA and BCCDC (through the TDO), and CFRI (through UILO). Agency specific IP related revenue data is provided in agency sections.

See Figure 11 for total number of invention disclosure, provisional patent and patent cooperative treaties (PCT) applications filed by fiscal year. Invention disclosures are primarily internal BCCA documents, filed with TDO to inform the decision of whether or not to proceed with the patent process. The next stage in the patent process is to file provisional patent applications followed by patent cooperative treaties, or PCTs, which act as a gateway to world-wide patents, each step involving greater specificity.

Figure 11

Total # of Invention Disclosures, Provisional Patent and PCT Applications Filed by Fiscal Year



See Figure 12 below for the number of national provisional patent applications filed and issued. Applications filed in a given year represent different applications than those which are approved in that same year.

Figure 12

Total # of National Provisional Patent Applications Filed and Issued by Fiscal Year

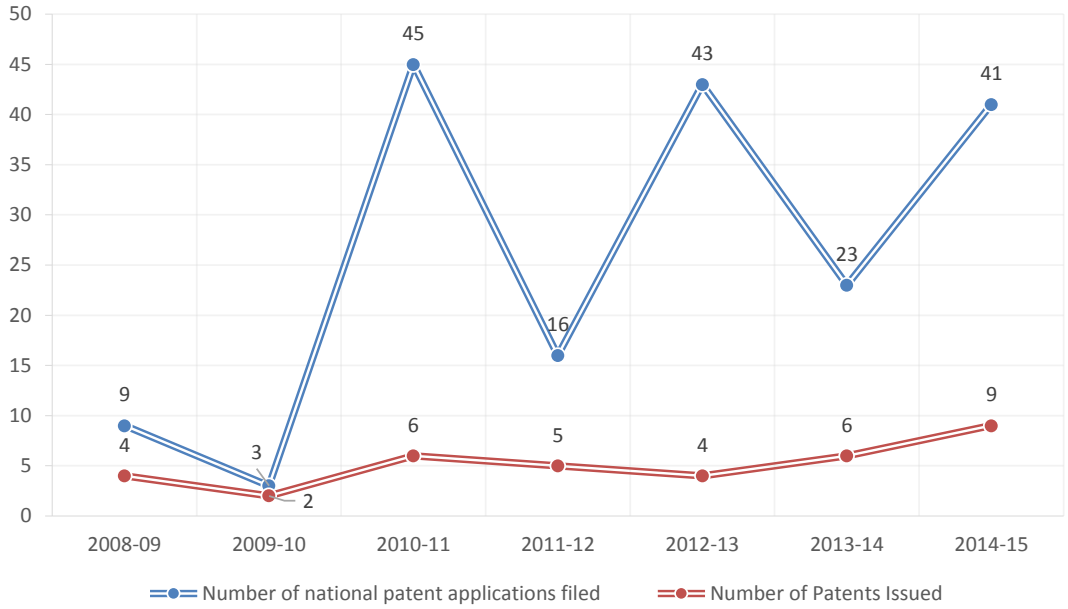
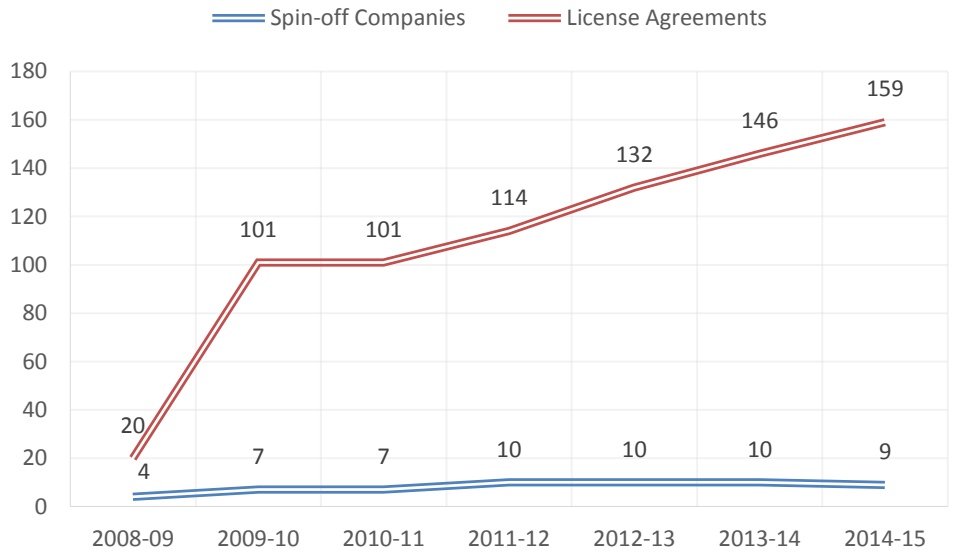


Figure 13 shows all licensing agreements and spin-off companies for both BCCA and CFRI combined for the past seven years. Agency specific numbers can be found in the agency section. One BCCA spin-off (Logipath Medical) became inactive in FY 2014-15.

Figure 13
License/Assignment Agreements and Spin-Off Companies by Fiscal Year

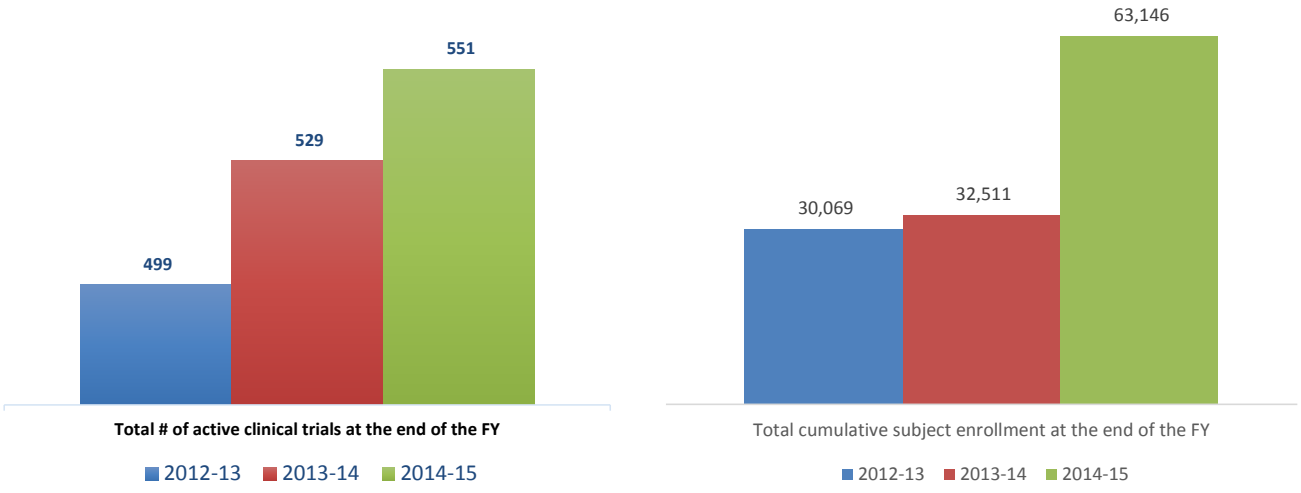


Advancing Health and Policy Benefits

For FY 2014-15, the number of clinical trials increased by 22 to 551. Enrollment increased dramatically and is the result of one study that reported zero (0) enrollment in FY 2013-14 and 27,000 enrollment this fiscal year, with expected enrollment to reach 90,000 over the course of the trial (CLIP study-Community Level Interventions for Pre-eclampsia). See Figure 14 for number of Clinical Trials and Total Cumulative Subject Enrollment by Fiscal Year.

The opportunity to participate in clinical trials is an important metric because it offers patients the opportunity to participate in clinical evaluation of new drugs, many of which achieve therapeutic benefits beyond those offered by standard of care treatment. Clinical trials also represent the final step in the translational research continuum, which begins with basic or discovery research, includes development of particular products, and culminates with the testing of those products in rigorous trials.

Figure 14
Total # of Clinical Trials and Total Cumulative Subject Enrollment by Fiscal Year

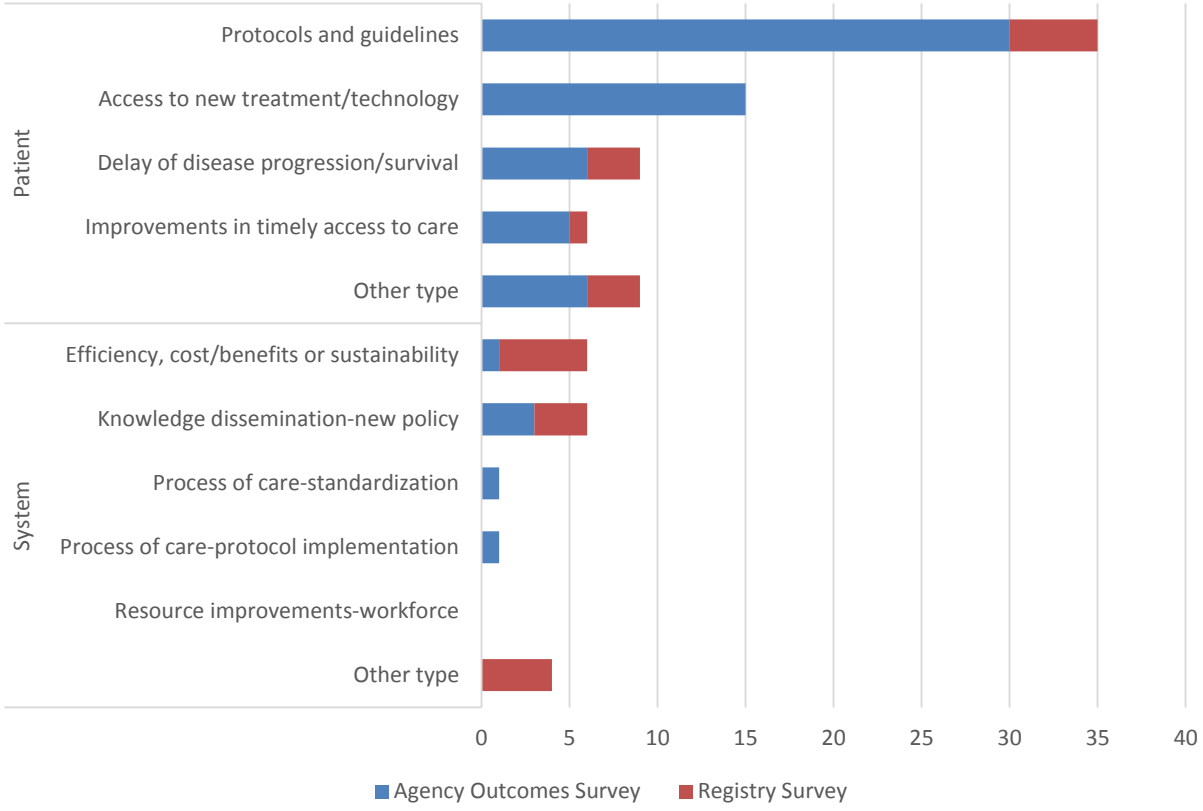


Advancing Health and Policy Benefits

In FY 2014-15, 4 of the 5 agencies completed the survey that asked respondents to identify guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2014-15 as a result of research driven by PHSA researchers or collaborative research in which PHSA researchers were key participants. The survey was not intended to be exhaustive, but to capture the significant, top of mind advancements, and, further, asked respondents to identify the benefits to patients, population health, and/or health system sustainability of those advancements. BCCA's outcomes were extracted from the data received from the UBC/PHSA Research Impacts survey results.

New this year, respondents were asked to classify the stated benefits into categories to more fully summarize the responses. These categories are shown below in the third column of data in Table 2 and mirror the benefit categories utilized in the Registry Survey. Figure 15 is a summary of the classification of benefits realized through research at the agencies and with data from the registries, combined. These represent the top choice of category as many benefits were classified into more than one category (see agency sections for details). System benefits were most often chosen as a secondary benefit. The other type category includes improvement of safety, improved diagnosis/treatment, and directional research.

Figure 15
Classification of Benefits Summary for FY 2014-15 for All Agencies & Registries



In addition, Table 2 lists a key achievement for each agency with full details provided in each agency/reporting entity section and document important achievements in translational research.

Table 2

Guideline, drug, diagnostic agent, or device adopted or approved in FY 2014-15 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified	Type of Benefit
BCCA researchers launched the second phase of the POG (personalized Onco-genomics) project which involves sequencing the DNA of individual patients to guide treatment.	The BCCA's POG project (supported by the BC Cancer Foundation) will develop new, targeted cancer therapies for patients who have exhausted standard treatment options. Phase 2 will see a reduced time to analyze a patient's tumor sample from six weeks to two weeks. This project has the potential to develop new, targeted cancer therapies which will extend the lives of patients of all ages facing the most aggressive cancers.	**Patient:** Access to new treatment/technology
A new diagnostic test that better detects fetal abnormalities was implemented in February 2015. The 'prenatal chromosome microarray' technique is used during ultrasounds and provides a clearer picture than the previous conventional technique (called 'karyotyping'). Using the new technique, families are able to get results faster, in 8-10 days compared to 14 days previously.	The improved diagnostic technique used to test for fetal abnormalities provides greater detection and faster results to parents. The 'prenatal chromosome microarray' test is less costly than the previous conventional method.	**Patient:** Improvements in timely access to care **System:** Efficiency, cost/benefits or sustainability
As reported in prior years, interest in the START led to the development of an adolescent version. The Short Term Assessment of Risk & Treatability-Adolescent Version (START-AV) was released in 2014. The team held a START-AV workshop at the International Association of Forensic Mental Health in June 2014. Throughout the past year it has been implemented into practice internationally. For example, The Ontario School Board has begun to utilize the measure, in the Netherlands it is being used in civil psychiatric inpatient practice, and it is being used in juvenile justice setting in the US.	The objective of the START-AV is to prevent adverse events and support treatment planning for adolescent mental health populations, including both civil mental health and justice populations.	**Patient:** Protocols and guidelines **System:** Process of care-protocol implementation
Unprecedented identification of early summer/fall LTCF outbreaks and detailed genetic and antigenic characterization of influenza viruses by the BCCDC's Influenza and Emerging Respiratory Pathogens' team directly contributed to urgent communications about virus drift, vaccine mismatch, reduced vaccine effectiveness and the need for adjunct protective measures. This led to national guidelines for expanded antiviral use for control of LTCF influenza outbreaks by the Canadian Association of Medical Microbiologists and Infectious Disease Specialists (AMMI) to which Dr. Skowronski was a contributing expert and author. Predicated on knowledge also disseminated through BCCDC Influenza Surveillance Bulletins, 2014-15, with examples of public health	Early recognition during the summer/fall 2014 of mutations in the circulating influenza virus and genomic analyses that correlated these changes with reduced vaccine effectiveness enabled BCCDC to engage in broad communication about adjunct protective measures for the most vulnerable. This included real-time revised national guidelines for expanded antiviral use in the control of long-term care facility outbreaks and treatment of high-risk individuals.	**Patient:** Delay of disease progression/survival through enhanced use of antivirals and awareness about early treatment for high-risk individuals **Patient:** Protocols and guidelines **System:** Knowledge dissemination-new policy

alerts/bulletins related to early season activity and vaccine mismatch, and media communications to the public about how to protect themselves in that context:		
WHRI researcher was the principal author of a national guidance document: Society for Obstetricians and Gynaecologists of Canada Committee Opinion on the Management of a Pregnant Woman Exposed to or Infected With Ebola Virus Disease in Canada.	This guidance document was developed in response to an outbreak of Ebola virus disease in West Africa and outlines recommendations on the management of a pregnant woman exposed to or infected with Ebola. Improved public safety due to reduced disease transmission in the event of a local outbreak.	**Patient:** protocols and guidelines

BC Cancer Agency (BCCA)

Producing and Advancing Knowledge

In FY 2014-15, researchers affiliated with BCCA were awarded a total of $75,311,803 in research funding. The amount awarded as Operating Grants ($57,278,845) makes up 76.1% of total funding received. While this appears to be a large decrease from last fiscal year, it is in line with operating grant levels from the previous 6 years. The greatest variability in funding type over the past six years, is with Infrastructure Awards which has ranged from a high of 31.4% of total awards in 2009-10 to a low of 1.5% in FY 2013-14. This year's amount, $14,114,169, represents almost 20% of total awards for FY 2014-15 and is the result of a large grant in excess of $11.2M for one researcher. A breakdown of funding types and subtypes can be found in Figures 16.

BCCA's portion of the Indirect Costs Program grant for FY 2014-15 is $1,554,366, but is not included in total research funding or the figures below.

Figure 16
Total BCCA Research Funding by Funding Type and Sub-type by Fiscal Year

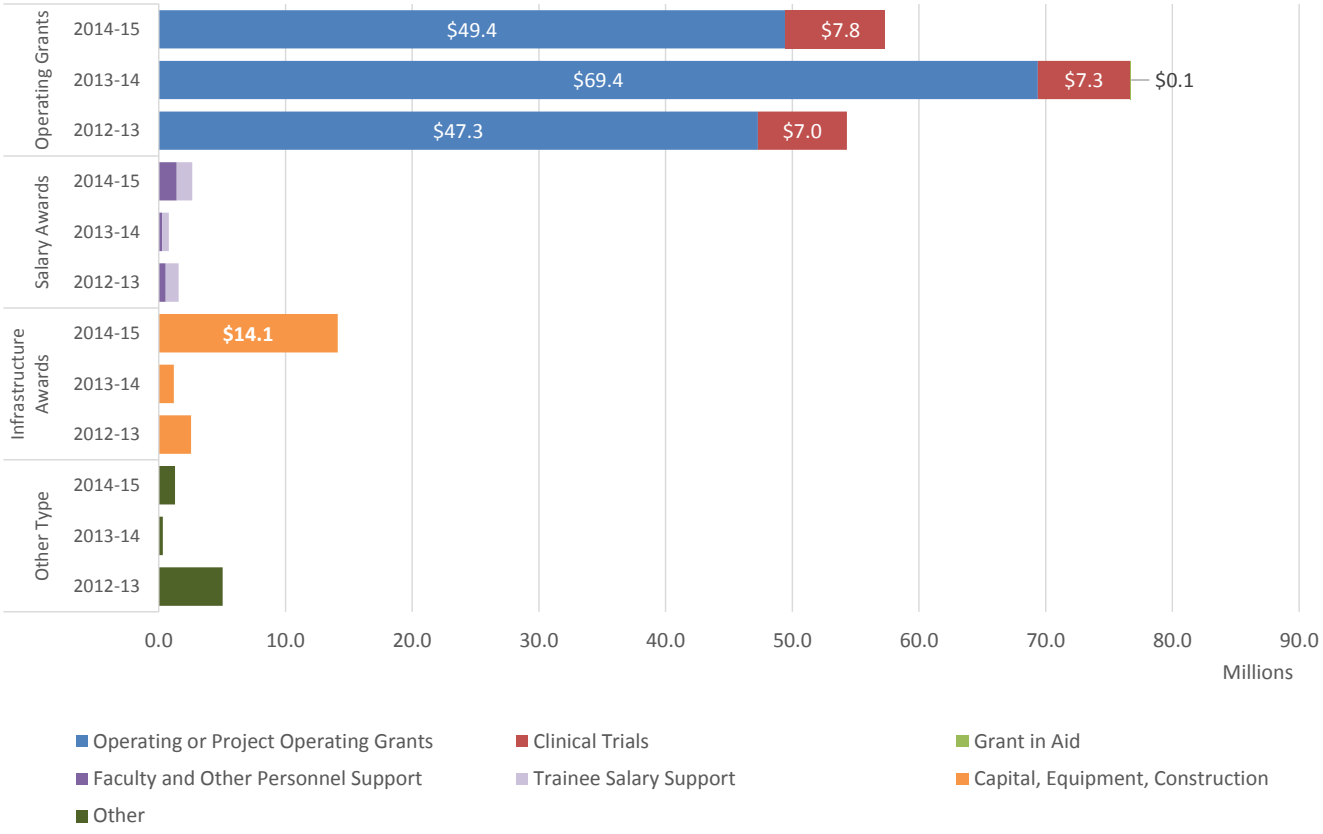


Figure 17 shows the percentage of funding by funding source category for the past 5 fiscal years. The Major Canadian Funding Entity category includes CIHR and its Institutes, Genome Canada and the Provincial Genome Agencies, Michael Smith Foundation for Health Research (MSFHR), Natural Sciences & Engineering Research Council (NSERC), and the Social Sciences & Humanities Research Council (SSHRC). Of note is the large increase in the Canadian Government category to 19% for FY 2014-15 from 3% last year. This increase can be attributed to a BCCA researcher receiving a $10M grant from the Canada Foundation for Innovation. There was also a large decrease in the Canadian Foundation & Non-Profit category from 45.5% to 33.6% for FY 2014-15, which is attributed to one large grant from the BC Cancer Foundation in the previous FY. While there has been fluctuation between categories, Canadian sources of funding have remained approximately 80% of total funding, each year.

Figure 17
Percentage of BCCA Research Funding by Funding Source Category by Fiscal Year

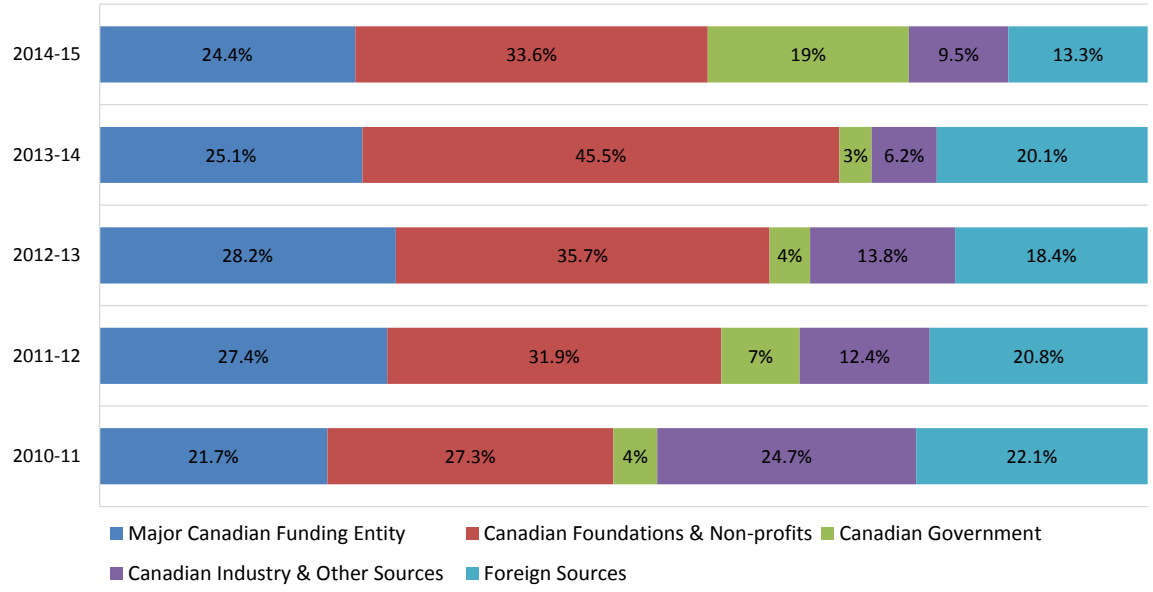
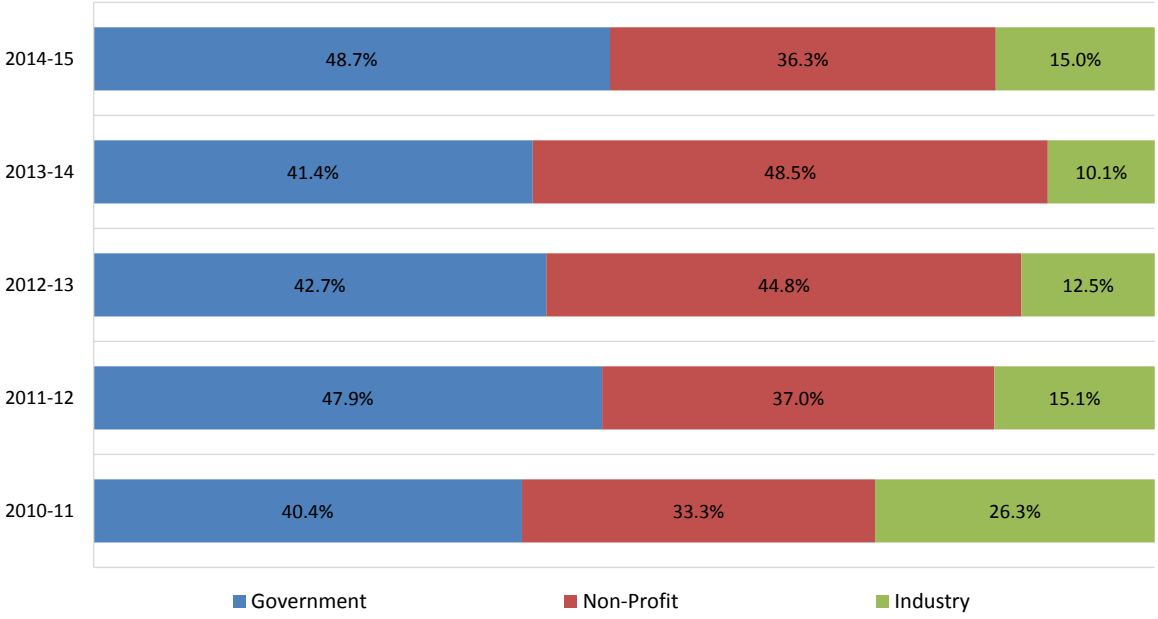


Figure 18 shows the award data by RISe sector (see glossary, pg. 80, for sector definition) by fiscal year for the past 5 years.

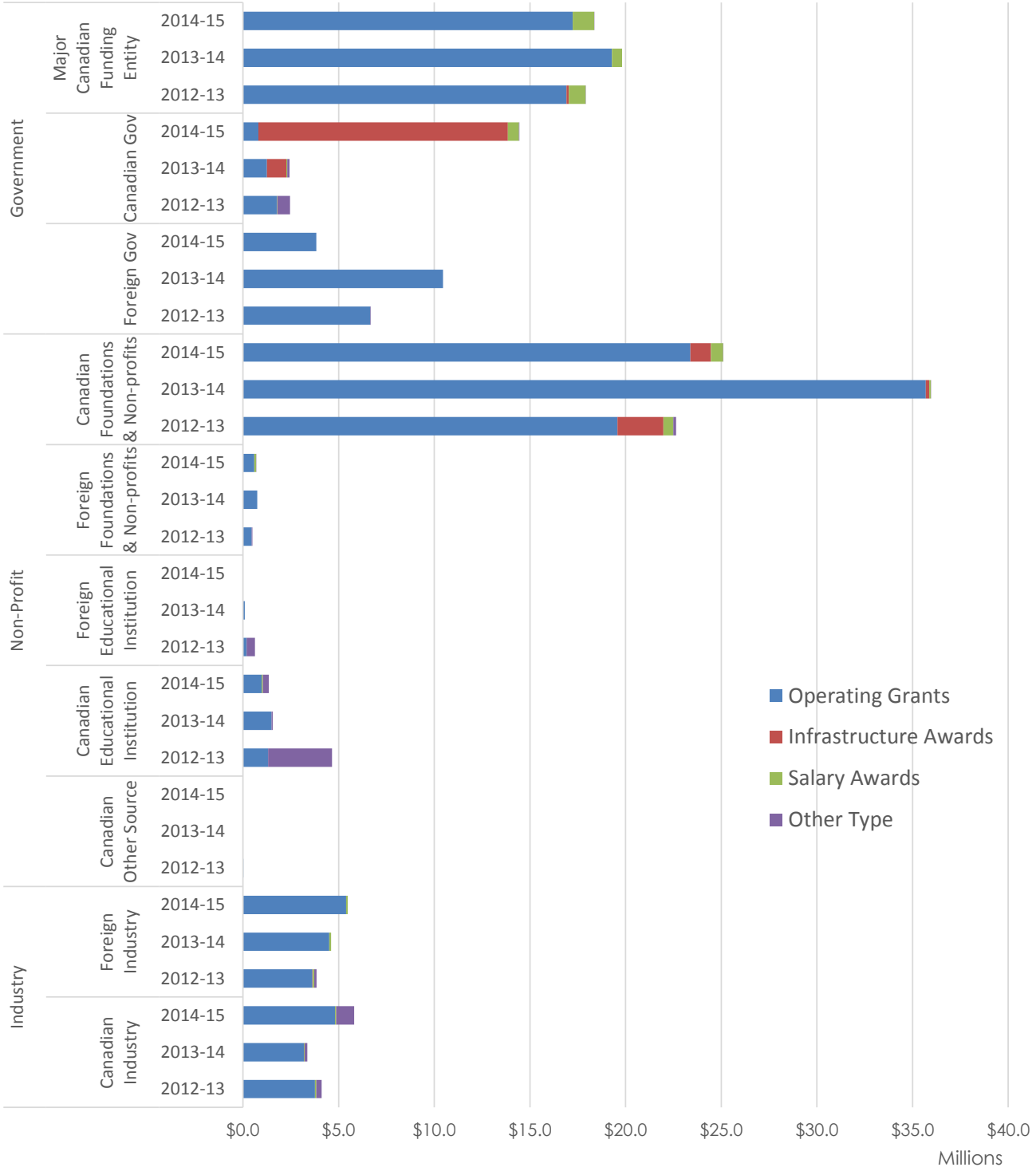
Figure 18
Percentage of BCCA Research Funding by RISe Sector by Fiscal Year



As in the PHSA overall section, BCCA's Total Award Funding is shown by RISe sector, Funding Source Category and Funding Type. As in all previous years, the top funding sources continue to be Canadian Foundations & Non-profits and the Major Canadian Funding Sources (CIHR, MSFHR, NSERC, SSHRC and Genome Canada). Figure 19 details the major funding categories by funding type.

Figure 19

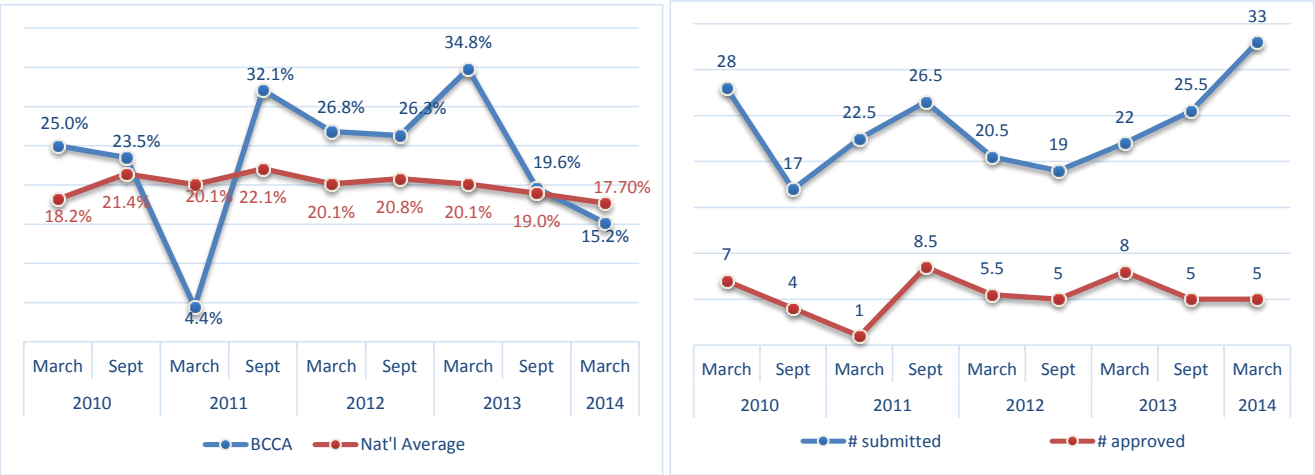
BCCA Research Funding by RISe Sector, Funding Source Category and Type by Fiscal Year



BCCA has exceeded the national average for CIHR operating grant competitions in 7 of 9 competitions over the past 5 years. This March 2014 competition resulted in 5 approved applications and is in line with historical figures. CIHR did not hold a September competition in 2014. Figure 20 below shows CIHR grant application success rates for BCCA compared to the national average as well as number of applications submitted and approved.

Figure 20

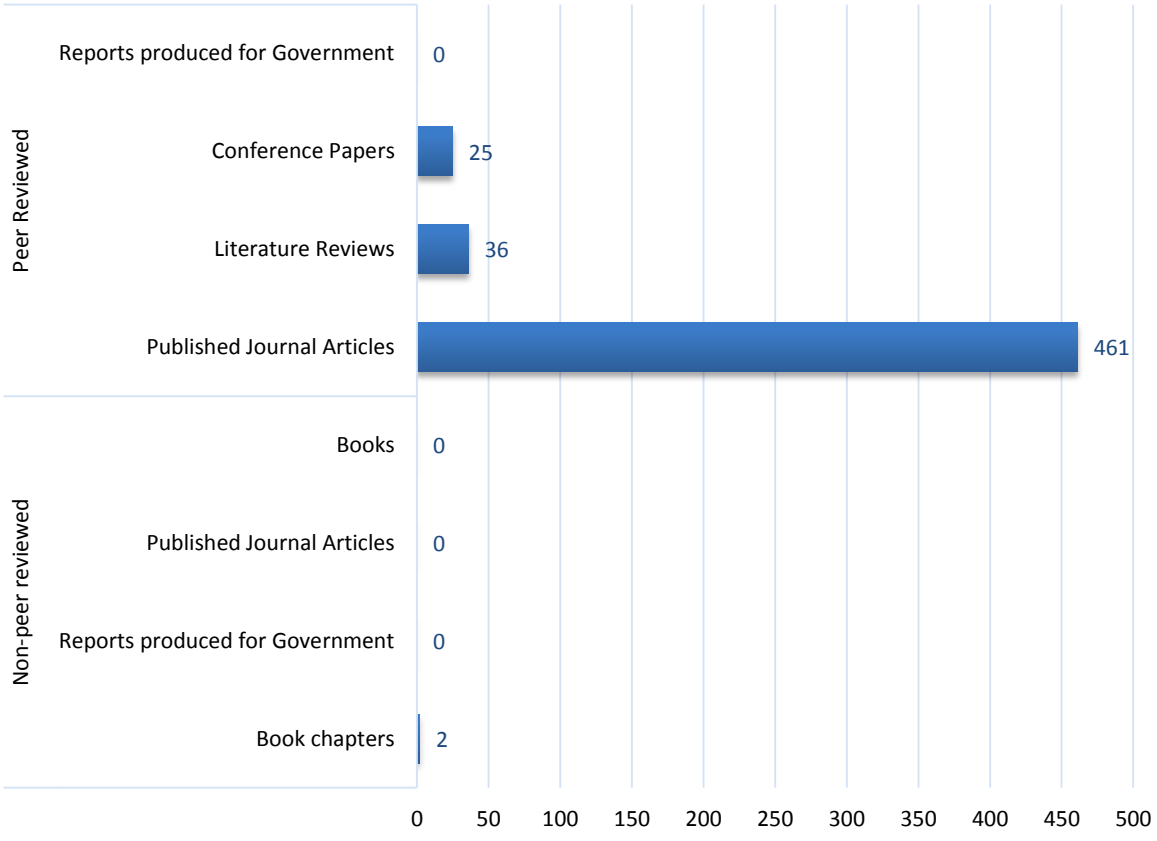
BCCA's CIHR Operating Grant Application Success Rate & Number of Applications Submitted/Approved



Total number of publications by type and category of peer vs. non-peer review is seen in Figure 21. Due to SciVal providing data on a calendar year basis, data is provided for Jan – Dec 2014 for BCCA and totals 524 publications.

Figure 21

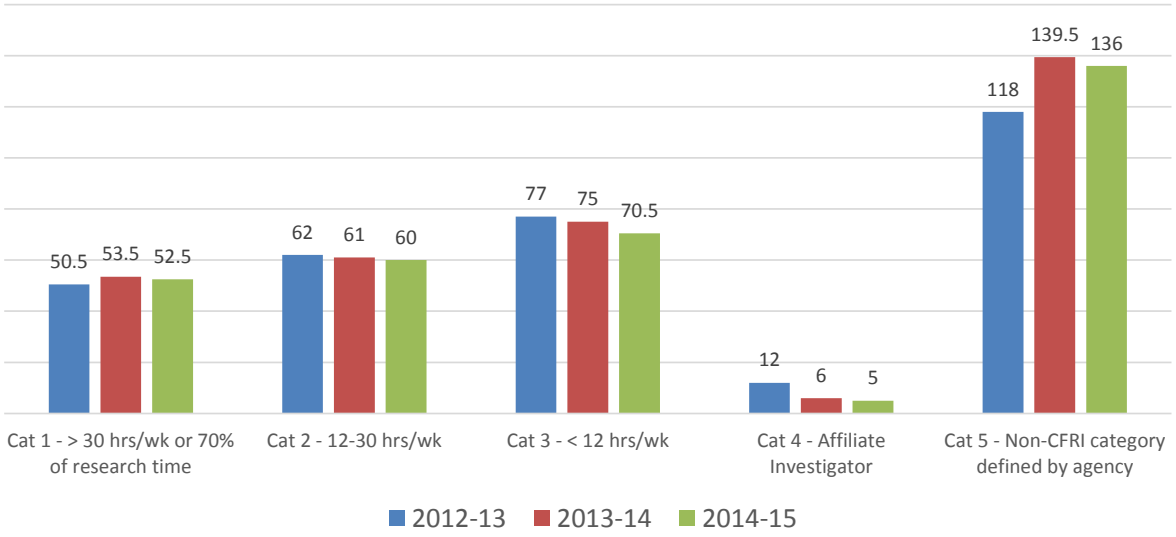
Total Number of BCCA Publications by Type and Category



Building Research Capacity

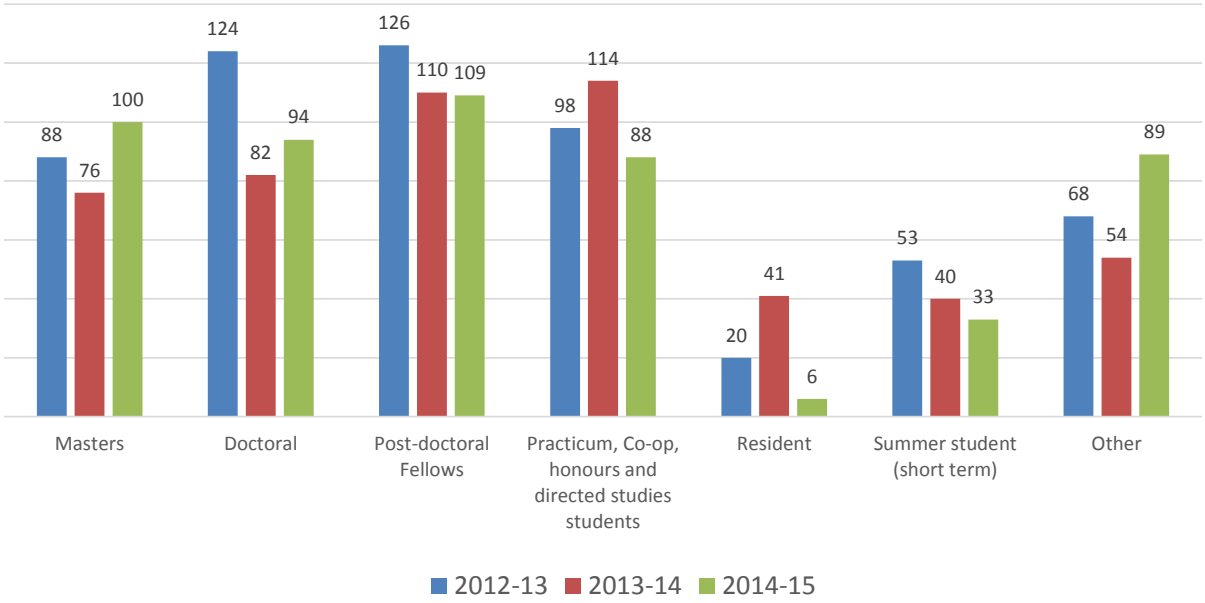
BCCA has a total of 319 researchers in FY 2014-15 in categories 1-3 and category 5, and 5 in category 4. While adoption of the CFRI category classifications is in place, a significant amount (136) of the total researchers are in Category 5, which is an agency specific category used to describe researchers that do not meet CFRI category classifications. For BCCA, the majority of Category 5 researchers are Medical or Radiation Oncologists, Program or Practice Leaders, Research Scientists and Nurses. As in past year's reports, researchers whose funding is officially split 50/50 between research entities are classified as 0.5. See Figure 22 for the number of researchers by category.

Figure 22
Total Number of BCCA Researchers by Category and Fiscal Year



During FY 2014-15, BCCA researchers provided training and supervision to a total of 519 trainees (up 2 from FY 2013-14). See Figure 23 for the number of trainees by type. Factors influencing the number of trainees include but are not limited to, operating grant success rates; whether trainees can obtain fellowships to secure their own funding, and how often trainee competitions are held and the envelope of funding.

Figure 23
Total Number of BCCA Trainees by Type and Fiscal Year

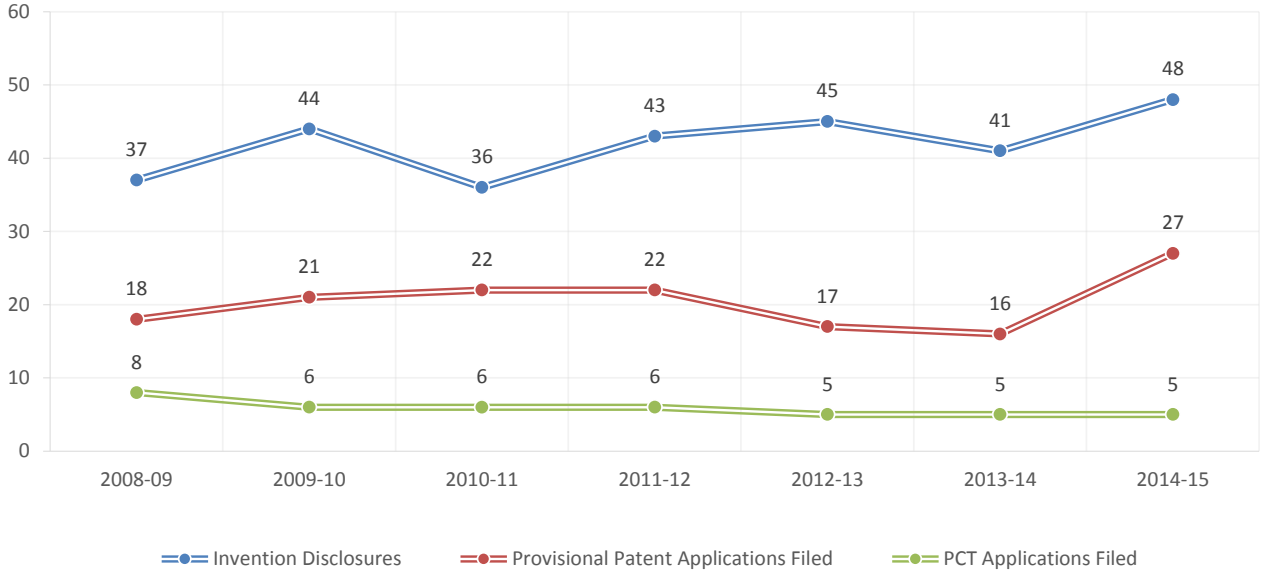


Achieving Economic Benefits and Innovation

BCCA Technology Development Office (TDO) Activities

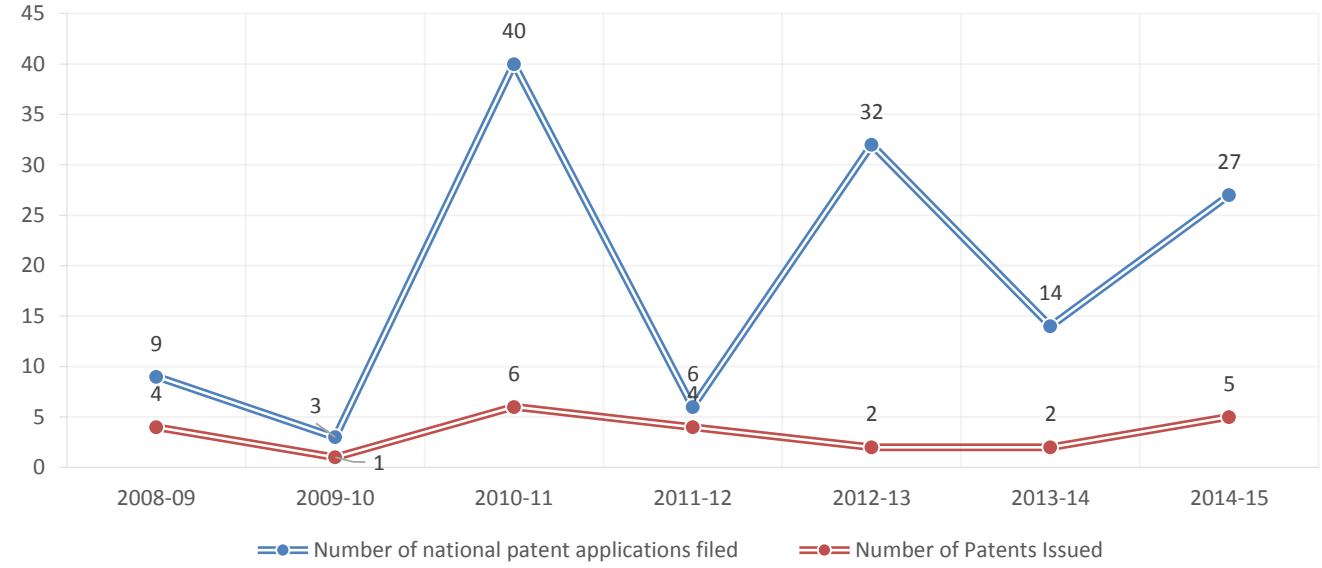
Patent Activity has remained relatively stable over the last seven fiscal years. Invention disclosures are primarily internal BCCA documents, filed with TDO to inform the decision of whether or not to proceed with the patent process. The next stage in the patent process is to file provisional patent applications followed by patent cooperative treaties, or PCTs, which act as a gateway to world-wide patents. See Figure 24 for patent activity statistics for the past seven years.

Figure 24
BCCA TDO Invention Disclosures, Provisional Patent and PCT Applications by Fiscal Year



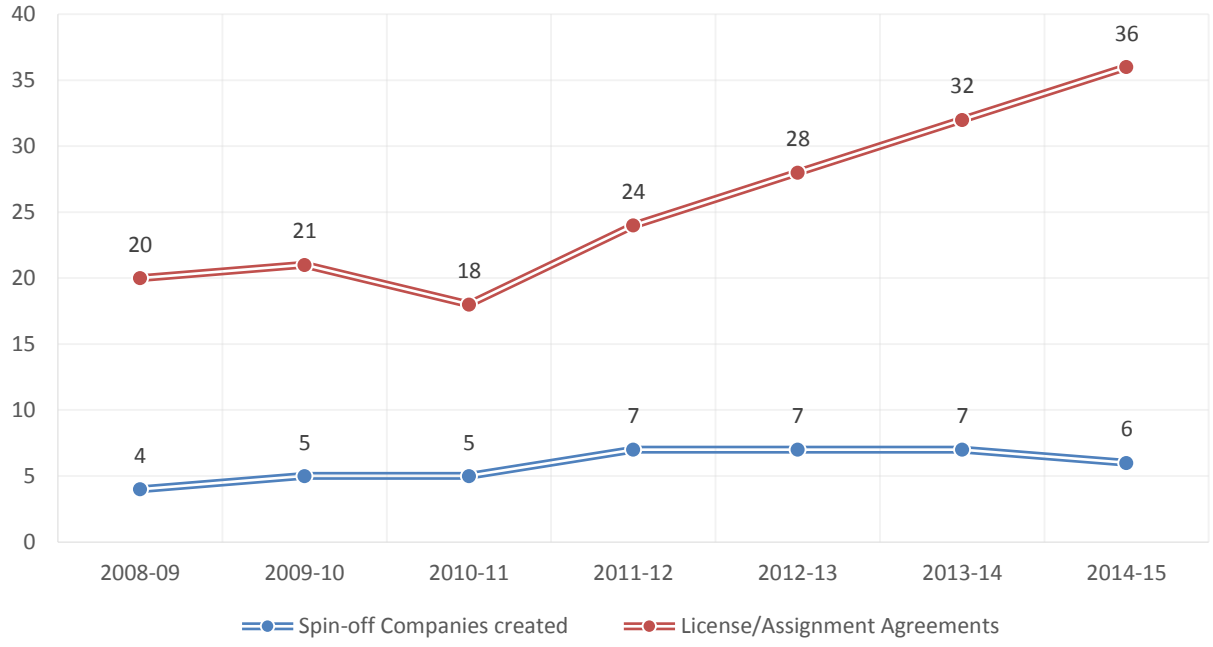
National patent applications are then filed with each step involving greater specificity. Patent applications filed in a given year represent different applications than those which are approved in that same year (which typically are the result of applications in previous years). Of note this year is the inclusion of the patent activity related to the Chlamydia Vaccine which was assigned to BCCA from BCCDC. See Figure 25 for a breakdown by fiscal year.

Figure 25
BCCA TDO National Patent Activity by Fiscal Year



In FY 2014-15, there were 36 (up 4 from last year) active license agreements (see Figure 26). There were 9 new licenses and 5 terminations. There were no new spin-off companies created. Other active Spin-off companies include Aquinox Pharmaceuticals, Essa Pharmaceuticals, Repeat Diagnostics, Verisante and Fusion Genomics. Logipath Medical became inactive during FY 2014-15.

Figure 26
BCCA License Agreements and Spin-Off Companies by Fiscal Year



IP related revenue, in accordance with UBC (University Industry Liaison Office UILO) definitions (see Glossary – Appendix 4, page 67) is reported in Table 3. Expenses related to patenting, license IP and legal costs totaled $964,170.44 in FY 2014-15. Realized licensing revenue per the distribution agreements totals $174,696.69, up $81,190.16 over last FY. While distribution agreements vary, typically the inventor receives 50% of the net licensing revenue, with the remainder split between PHSA, BCCA departments, and UBC for those researchers with a UBC affiliation.

Table 3
TDO IP Related Revenue

IP Related Revenue	FY 2012-13	FY 2013-14	FY 2014-15
Royalties	343,954.18	387,894.13	731,038.63
Equity Liquidated	36,177.85		37,032.37
License Fees	10,000.00	54,725.00	200,740.00
License Management	272,601.94	314,161.97	358,490.88
Option Fees	9,350.00		
Technology Assignment	56,100.00		
Gross Licensing Revenue (total)	**728,183.97**	**756,781.10**	**1,327,301.88**

Advancing Health and Policy Benefits

Clinical trial data is provided for a second year utilizing the same methodology as last year. See Table 4 for a detailed breakdown of clinical trial activity by fiscal year. Of note, is that approximately 26% of BCCA trials had no enrollment figures, an improvement over the 30% figure from FY 2013-14. Once these fields are made mandatory as opposed to optional, as they now are, enrollment figures should increase.

Table 4
BCCA Clinical Trials

	11-12	12-13	13-14	14-15
Total Number of Clinical Trials active during the FY	272	300	321	317
Status of the Trial at the end of the FY:				
Total Number of Active Trials	151	212	274	234
Total Number of Trials that closed during the FY	121	88	47	83
Enrolment Numbers:				
Expected Local Subject Enrolment (for the term of the study)	36,022	35,899	36,653	41,867
Total Cumulative Subject enrolment at the end of the FY	24,439	25,515	27,299	28,521

Table 5 present the information extracted from the UBC/PHSA Research Impacts survey that was beta tested with BCCA for FY 2014-15. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 5
BCCA Outcome Survey Responses

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
A BC Cancer Agency led initiative has led to the launch of a website about steps to reduce breast cancer risk. BC's leading cancer organizations have joined together to create Five Plus (www.fiveplusbc.ca) a new website that encourages women to take five steps that may help to prevent breast cancer, plus two actions for possible early detection.	This new joint initiative will allow more women to know that they can take steps to reduce their risk of breast cancer. Further it will educate that mammograms help find cancer in its earliest stages and that women who are screened through the BCCA's screening mammography program have a 25% reduction in deaths from breast cancer	Patient: Delay of Disease/survival
BCCA researchers launched the second phase of the POG (personalized Onco-genomics) project which involves sequencing the DNA of individual patients to guide treatment.	The BCCA's POG project (supported by the BC Cancer Foundation) will develop new, targeted cancer therapies for patients who have exhausted standard treatment options. Phase 2 will see a reduced time to analyze a patient's tumor sample from six weeks to two weeks. This project has the potential to develop new, targeted cancer therapies which will extend the lives of patients of all ages facing the most aggressive cancers.	Patient: Access to new treatment/technology
BCCA Researchers mapped the evolution of breast cancer "avatars". These are models of human breast cancer tissue, taken from patient –donated samples and will be used to measure how complex cancers develop and can change over time. This unprecedented research will use single cancer cells to expose how breast cancers evolve and also how to identify the cell populations that expand and dominate as time progresses.	This major advancement comes at a critical time as the power of genomic sequencing is being integrated into patient trials at the BCCA. This model will catapult our level of understanding of the growth of breast cancer. Until now, the evolution of a patient's cancer has been overlooked from a treatment perspective without a way to accurately analyze and measure the changing cell populations.	Patient: Access to new treatment/technology
BC Cancer Agency Researchers will co-lead a $60M National Initiative for Innovative Cancer treatments. Dr. Brad Nelson and Dr. Rob Holt will play a key roles in the first Network Centres of Excellence (NCE) devoted to cancer research. This includes a $25M commitment from the Government of Canada and an additional $35M from Canadian partners. Dr. Nelson	This project will allow for major advancements in cancer care by providing a personalized treatment that enables the patients' immune system to recognize and destroy cancer cells throughout the body. This NCE support will enable a series of adoptive T cell therapy clinical trials for Canadian cancer patients. Further	Patient: Access to new treatment/technology

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
will co-lead the cell therapy program; Dr. Holt will run an immune monitoring program encompassing all three of the focus areas within the national program.	because of Dr. Holt's work this initiative will allow BCCA to quickly and thoroughly measure how strongly patients' immune systems respond to these new therapies.	
BCCA researchers were highlighted as part of a global initiative to understand the human "epigenome". This was part of a seven year project referred to as the Roadmap Epigenomics Program funded through the NIH. A BCCA researcher is a senior author on one of the papers which integrates all 111 epigenomes into a single comparative analysis.	This program offers a resource for understanding how our genetic blueprint is interpreted in different cell tissue types. The BCCA is the only Canadian member of this team and as such can bring benefits to our Canadian patients.	Patient: Access to new treatment/technology
The BCCA was part of a new provincial program to provide support to adult survivors of childhood cancer. This program will be dedicated to the clinical and research needs of adult childhood cancer survivors.	This program will improve transition services for cancer survivors moving from pediatric to adult care. A registry will be established to track patients and a recall of past patients who were treated when there was limited information about the effects of treatment during childhood will be performed so that appropriate follow up care can be provided over their lifetime.	System: Process of care- Standardization
Breakthrough childhood cancer discovery made by Scientists at the BCCA. BCCA Researchers published this research in Cancer Cell which highlights the new hope for treatment of high-risk childhood sarcomas – a type of cancer that has seen almost no treatment improvement in the last 20 years. Sarcomas are more common in children and are hard to treat because of their high likelihood to metastasize. Until Dr. Sorensen's research there is very little information about the mechanism of how sarcoma cells spread to other organs. Dr. Sorensen and his team studied a previously unrecognized pathway involving two proteins.	This landmark study will provide hope that broad improvements can be made in the treatment of childhood sarcomas in the very near future. This research shows how sarcoma cells adapt to harsh tumour environments, mostly by activating a HIF1a pathway that allows them to survive and acquire metastatic capacity. Knowing this, researchers at BCCA can look at how to target this pathway in tumour cells as a tumour-specific therapeutic strategy.	Patient: Access to new treatment/technology
BCCA researchers have developed a breast cancer test called the PAM50 breast cancer molecular subtyping test. The test, developed by a BCCA researcher and his team at BCCA and Lower Mainland Labs,	The ROR score gives the probability of distant recurrence of the disease over 10 years in women with early-stage breast cancer. With the results, doctors and patients can make more	Patient: Access to new treatment/technology

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
measures the expression of 50 breast cancer genes. It determines the breast cancer subtype and assigns a risk of recurrence score (ROR).	informed decisions about their treatment.	
A BCCA Researcher will lead one of the Canadian teams involved in the newly established NCI Quantitative Imaging Network (QIN). QIN will leverage resources in Canada and the US to promote research on the development and validation of more quantitative imaging methods for the prediction and measurement of tumour response to cancer therapies in the clinical trial setting. In BC, this team will aim to improve existing methods to measure tumour size and activity and relate the total tumour mass to the amount of circulating tumour DNA in the blood. An assessment will then be performed whether the integration of tumour imaging and genomic analysis can improve the early detection of treatment resistance with the hope of improving the ability to predict which cancers will be responsive/resistant to treatment.	This research will improve the ability to measure the effectiveness of new anti-cancer drugs in clinical trials and help identify the best treatment for a given cancer patient. It builds on the groundbreaking clinical research in personalized oncogenomics.	Patient: Access to new treatment/technology
BCCA Researchers listed as some of the world's most influential scientific minds. Dr. Joe Connors, Dr. Randy Gascoyne, Dr. Marco Marra and Dr. Steven Jones were all recognized as part of the Thomson Reuters World's Most Influential Scientific Minds. Thomson Reuters analyzed data to determine which researcher have produced work most frequently acknowledged by their peers over the last 11 years. The report lists 3200 individuals who published the greatest number of highly cited papers from 2002-2012.	Dr. Joe Connors, Randy Gascoyne and Marco Marra lead research at the BCCA that identifies genes that are mutated in different forms of lymphoma – this is an important first step to determining effective treatments. Dr. Steven Jones works with Dr. Marco Marra at the Genome Science Centre which is one of the world leaders in DNA sequencing analysis.	Patient: Access to new treatment/technology

Child & Family Research Institute (CFRI)

Producing and Advancing Knowledge

In FY 2014-15, researchers affiliated with CFRI were awarded a total of $48,510,988 in research funding, a decrease of $5,398,970 (10%) over last FY. The amounts awarded as Operating Grants ($35,109,102) and Salary Awards ($8,433,297) make up approximately 89.8% of total funding received. A breakdown of funding types and subtypes can be found in Figure 27. Figure 28 shows funding by funding source category. CFRI's portion of the Indirect Costs Program grant totaled $2,072,447.78, for FY 2014-15 but is not included in total research funding or the figures below.

Figure 27
Total CFRI Research Funding by Funding Type and Sub-type by Fiscal Year

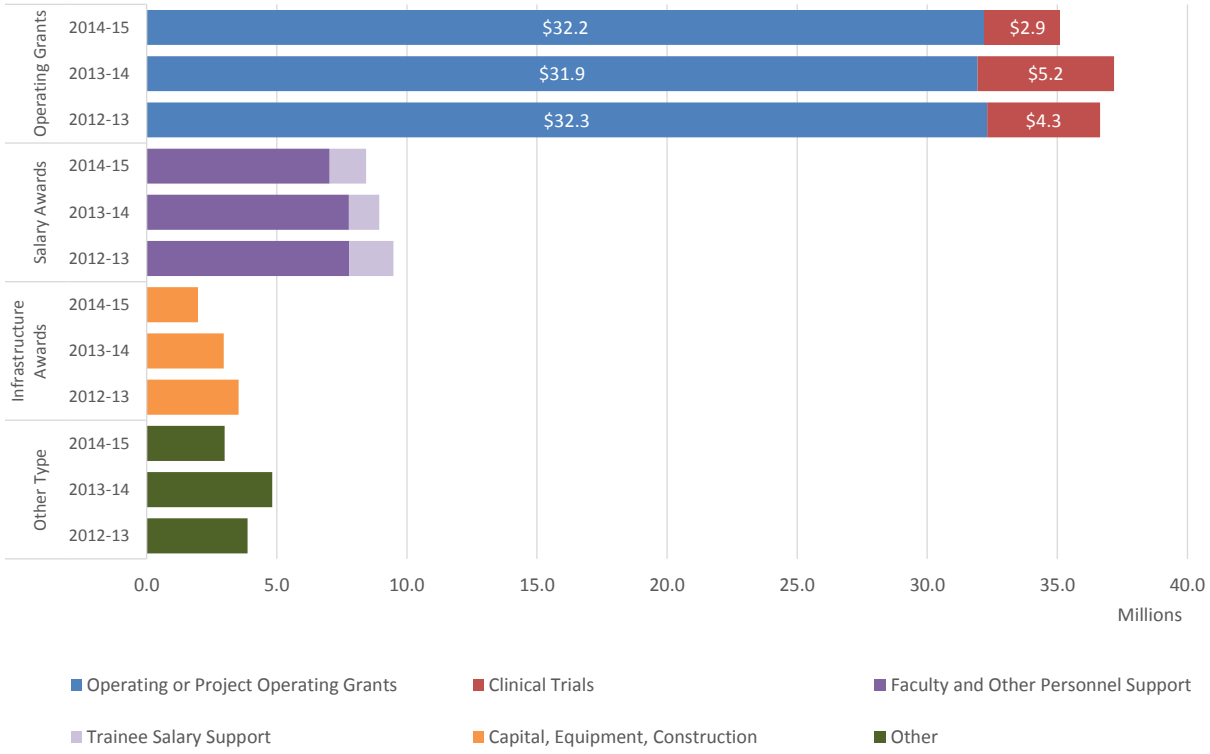
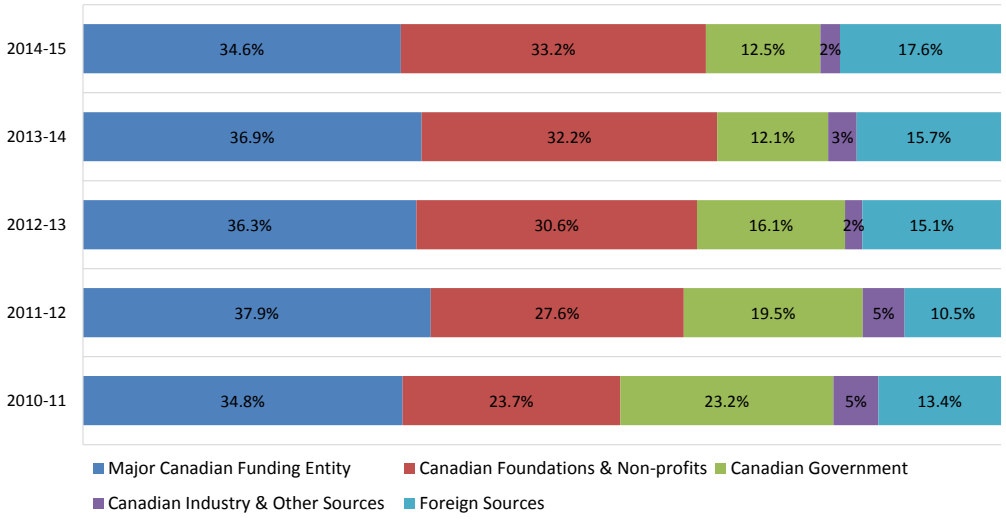
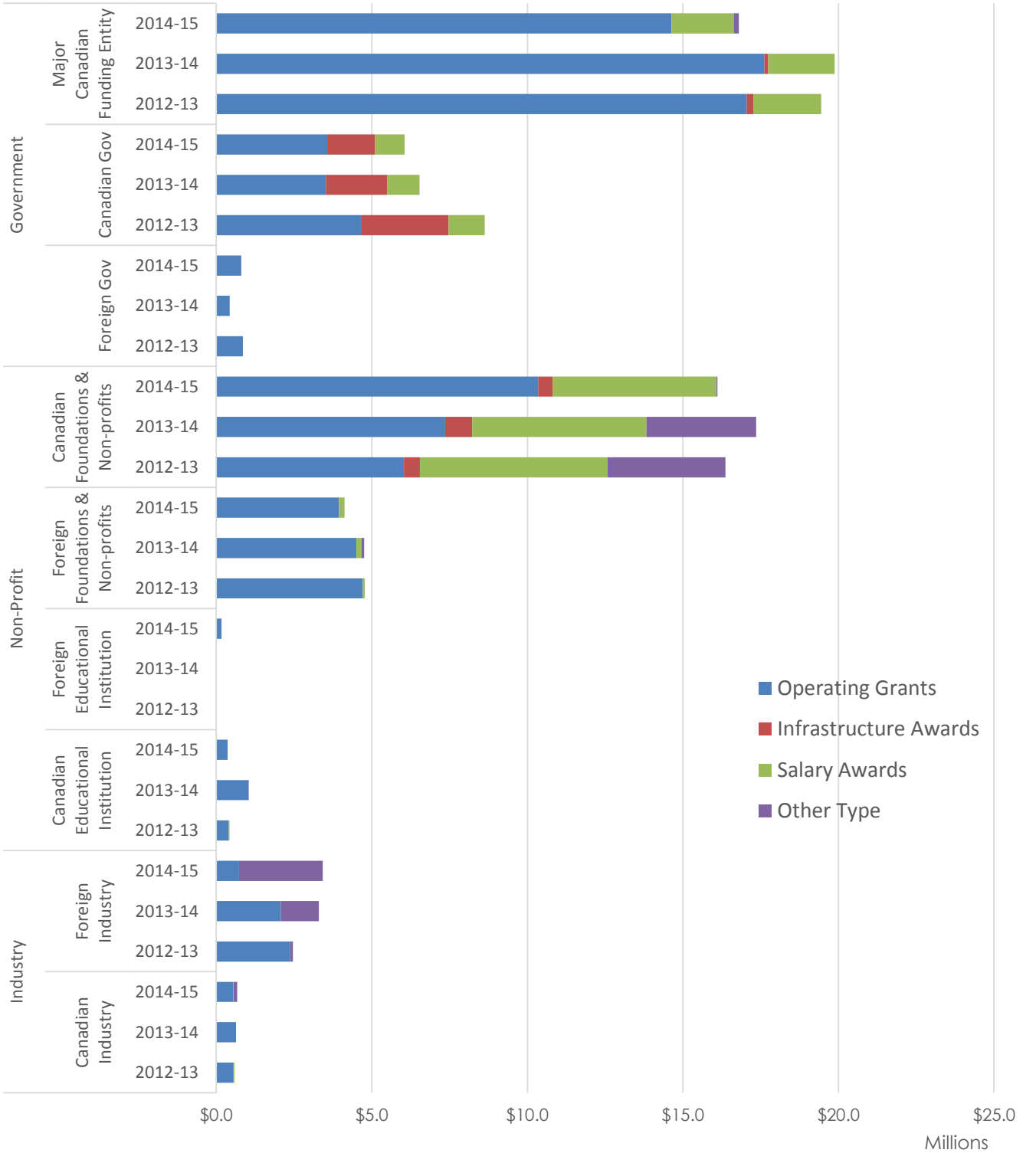


Figure 28
Percentage of CFRI Research Funding by Funding Source Category by Fiscal Year



The top three funding categories are Major Canadian Funding Entity (34.6%), Canadian Foundations & Non-Profits (33.2%) and Canadian Government (12.5%). Figure 29 details the RISe sector and funding categories by funding type.

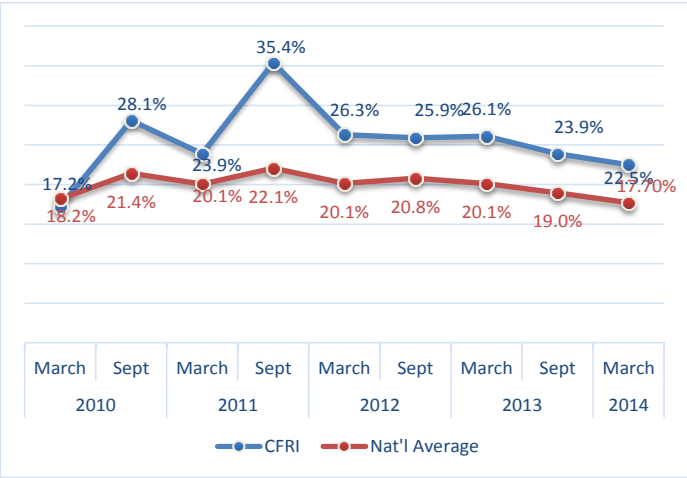
Figure 29
CFRI Research Funding by RISe Sector, Funding Source Category and Type by Fiscal Year

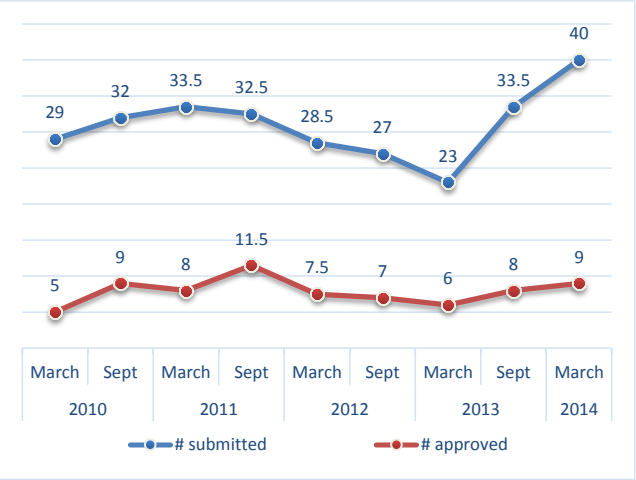


CFRI has demonstrated success in recent CIHR operating grant competitions, exceeding the national average in the March 2014 competition. In addition, CFRI has exceeded the national average in the last 8 of 9 competitions in the past 5 years. Figure 30 below shows the revised competition results (which occur in instances when, after the initial funding announcement, one of the CIHR Institutes decides to support highly ranked applications that have just missed the cut-off by providing a bridging award) and number of applications submitted and approved.

Figure 30

CFRI's CIHR Operating Grant Application Success Rate & Number of Applications Submitted/Approved

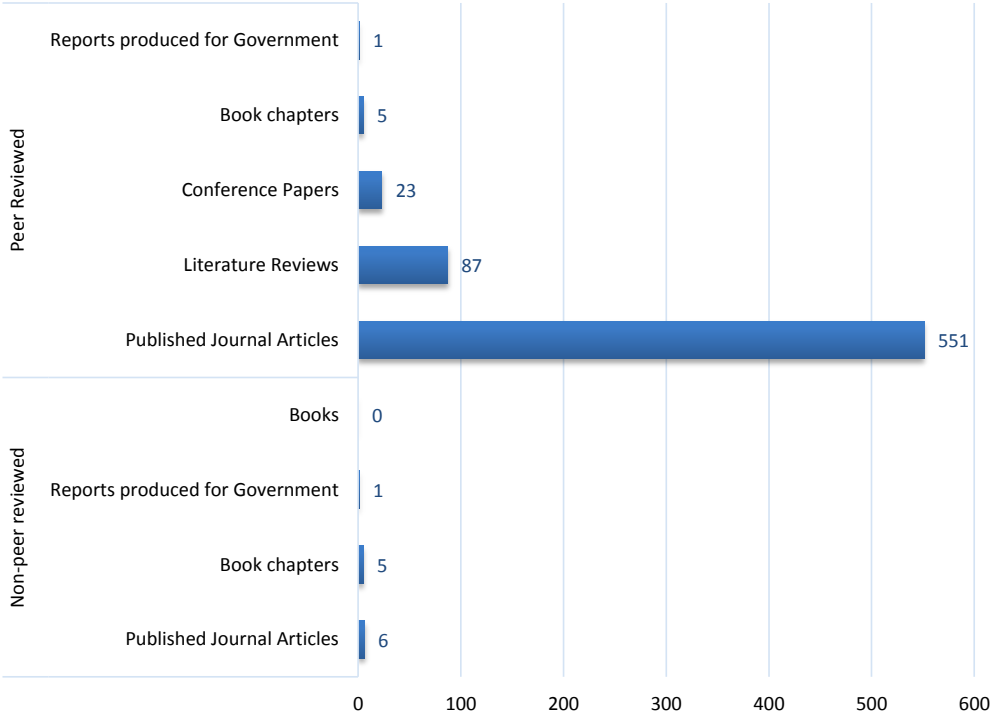




CFRI had 679 publications in calendar year 2014, with 98% of them being peer reviewed. Total number of publications by type and category of peer vs. non-peer reviewed, is seen in Figure 31 for. Peer review represents the gold standard for scientific credibility. The agency total represents the number of publications where at least one agency researcher was an author of the publication. When researchers from more than one research entity/agency collaborate on the same publication, it is counted once for each agency. CFRI includes case reports and essays in journal articles and accepts e-journal articles.

Figure 31

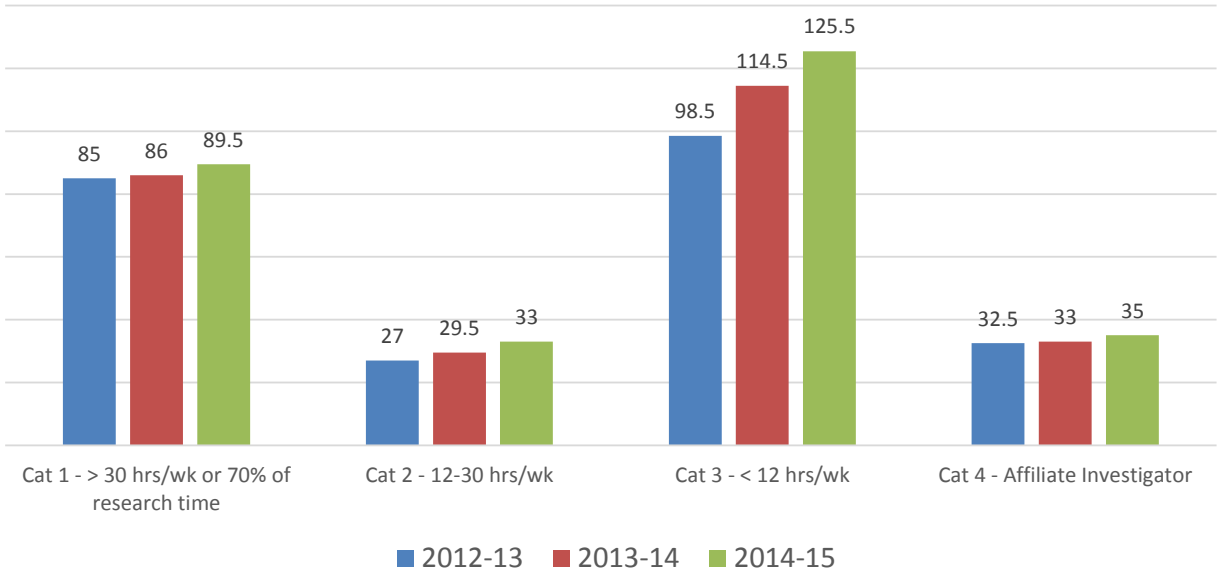
Total Number of CFRI Publications by Type and Category



Building Research Capacity

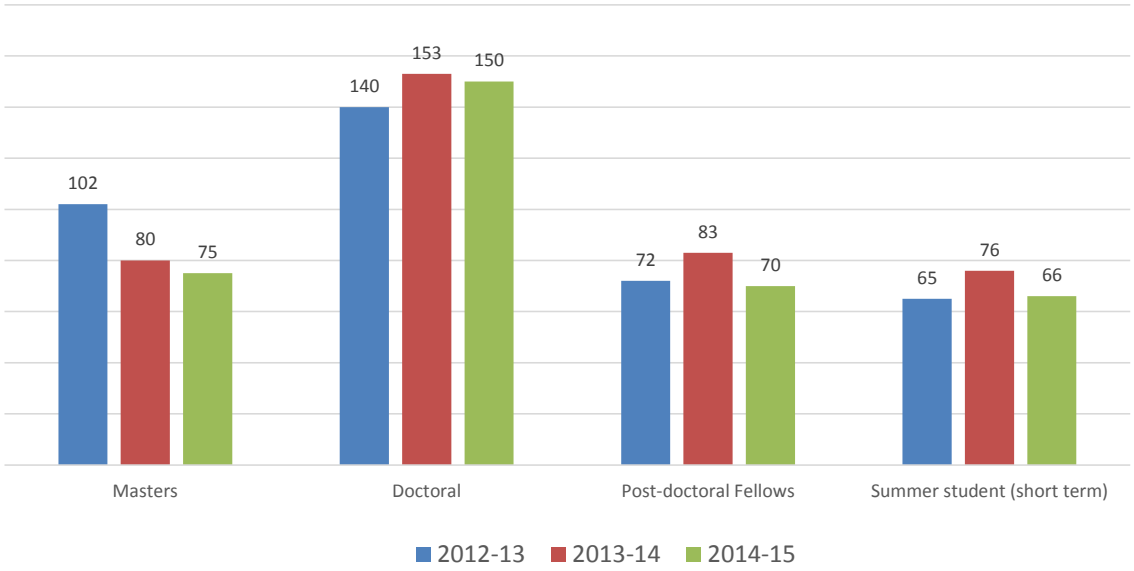
CFRI has a total of 248 researchers in categories 1-3. The distribution of these researchers is represented in Figure 32. Researchers in categories 1-3 are primarily based on the Children's & Women's Health Centre of BC campus with the largest proportion of the members being split between Category 1 – those that have greater than 30 hours per week / or 70% of their time protected for research and Category 3 – those that have less than 12 hours per week of protected research time. Category 4 members (35 in FY 2014-15) are affiliate investigators that are not based on site but who collaborate with CFRI members. Their primary affiliation will be with another academic and/or research institution. The purpose of this category is to provide official recognition for these individuals who collaborate with CFRI members on a regular basis. The CFRI does not track category 4 members funding, publications or trainees.

Figure 32
Total Number of CFRI Researchers by Category



During FY 2014-15, CFRI researchers provided training and supervision to a total of 361 (down 31 from FY 2013-14) trainees. See Figure 33 for number of trainees by type. The CFRI currently tracks full-time research trainees (masters, doctoral and postdoctoral fellows) and summer students undertaking their training at the CFRI. There are numerous co-op or directed studies students attached to the Institute, but due to their brief tenure on site, information on this group is not tracked.

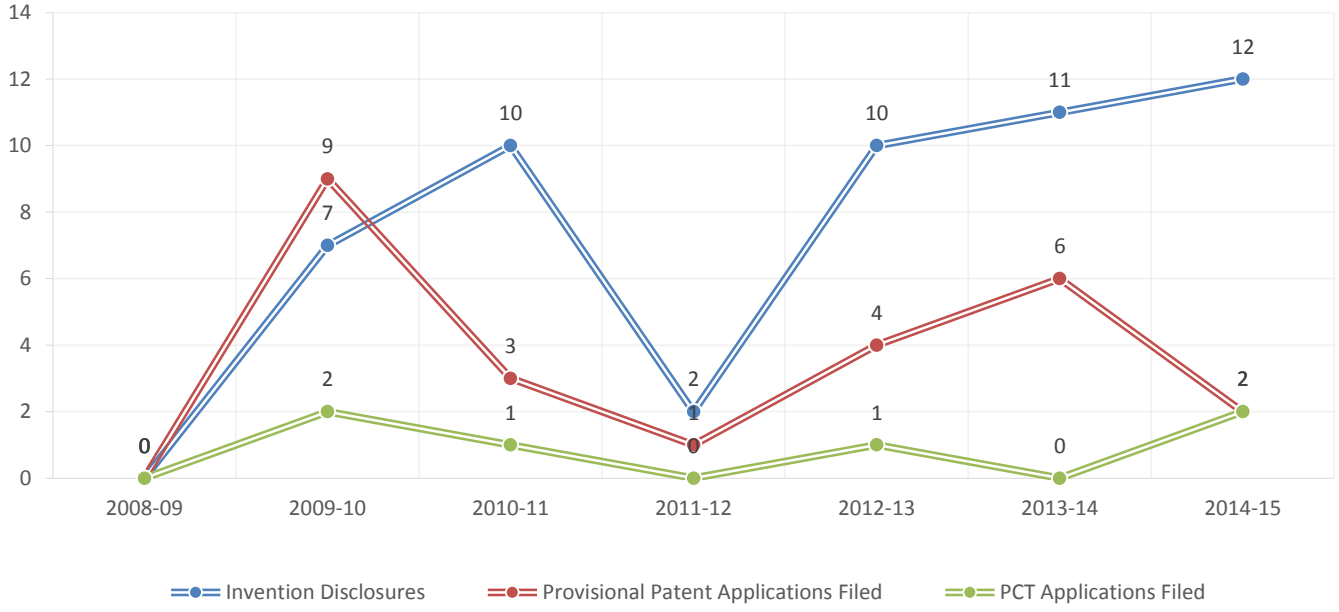
Figure 33
Total Number of CFRI Trainees by Type



Achieving Economic Benefits and Innovation

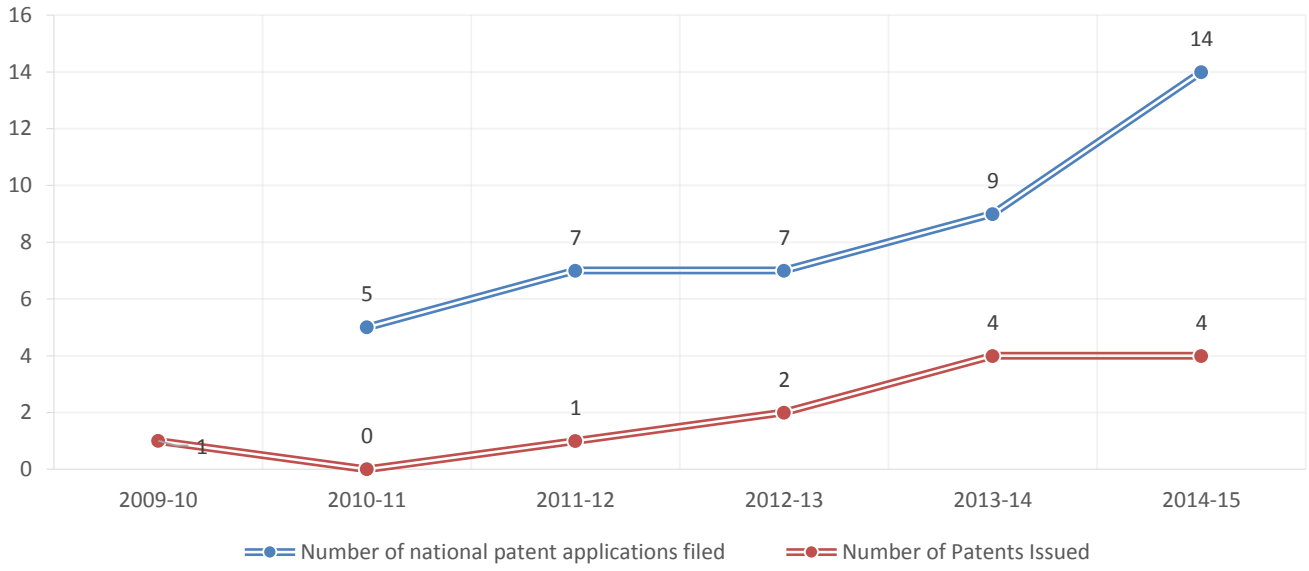
The number of invention disclosures, provisional patent and PCT applications filed by fiscal year are in Figure 34.

Figure 34
CFRI Invention Disclosures, Provisional Patent and PCT Applications Filed by Fiscal Year



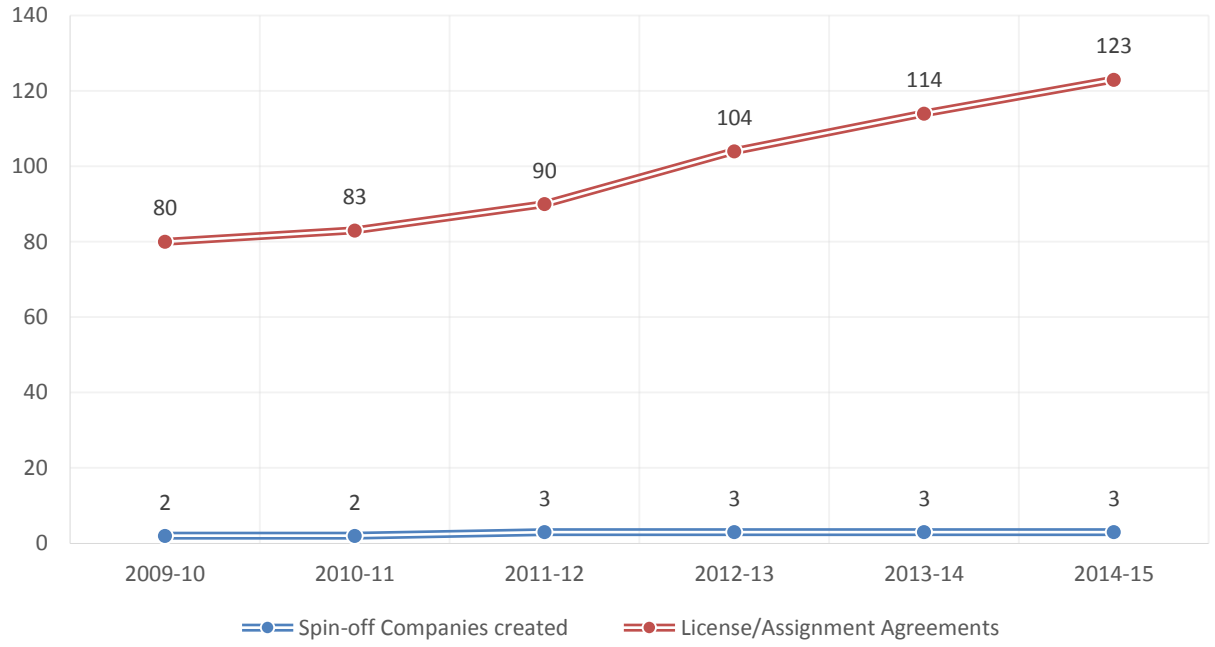
Patents are reported in Figure 35 below. Applications filed in a given year represent different applications than those which are approved in that same year (which typically are the result of applications in previous years). Data is collected and reported by the University Of British Columbia University-Industry Liaison Office (UILO).

Figure 35
CFRI National Patent Activity by Fiscal Year



In FY 2014-15 there were 123 (up by 14) active license/assignment agreements in place (See Figure 36). No new spin-off companies have been created. CFRI holds shares in three active companies – Urodynamix Technologies (publicly traded), Lions Gate Technologies, and BCY Lifesciences (publicly traded). Xenon Pharmaceuticals (private) is held in trust by UBC so is not included in the totals below.

Figure 36
CFRI License/Assignment Agreements and Spin-off Companies by Fiscal Year



Further clarifications on the reporting of IP related revenue, in accordance with UBC (University Industry Liaison Office UILO) definitions (see Glossary – Appendix 4) were done in FY 2013-14. See Table 6 for CFRI data by fiscal year. Expenses for patenting, legal & related costs for FY 2014-15 totaled $127,700. Realized revenue per the distribution agreements for FY 2014-15 was $28,758. This is the first year that realized revenue has been reported.

Table 6
CFRI IP Related Revenue

IP Related Revenue	FY 2012-13	FY 2013-14	FY 2014-15
Royalties	71,896.00	55,375.30	211,800
Equity Liquidated			
License Fees			
License Management			65,800
Option Fees			
Technology Assignment			
Net Licensing Revenue (total)	**71,896.00**	**55,375.30**	**149,900**

Advancing Health and Policy Benefits

Clinical trial data is provided for a second year utilizing the same methodology as last year. See Table 7 for a detailed breakdown of clinical trial activity by fiscal year. Of note is that approximately 35% of CFRI trials had no enrollment figures as compared to 48% last fiscal year. Once these fields are made mandatory as opposed to optional, as they now are, enrollment figures should increase.

Table 7
CFRI Clinical Trials

	11-12	12-13	13-14	14-15
Total Number of Clinical Trials active during the FY	146	154	166	183
Status of the Trial at the end of the FY:				
Total Number of Active Trials	80	101	133	143
Total Number of Trials that closed during the FY	66	53	33	40
Enrolment Numbers:				
Expected Local Subject Enrolment (for the term of the study)	9,285	10,037	120,491	102,505
Total Cumulative Subject enrolment at the end of the FY	2,191	1,851	7,023	31,379

The following table 8 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2014-15 as a result of research driven by CFRI researchers, and their corresponding benefits. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 8
CFRI Outcomes Survey Responses

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
A Concussion Awareness Training Tool (CATT) for parents, players, and coaches based on the latest research and best-practice guidelines on concussion diagnosis is now available. The free, online tool (www.cattonline.ca) developed by researchers from CFRI and the BC Injury Prevention Unit standardizes concussion recognition, diagnosis, treatment and management. It includes a brief training course on how to recognize and respond to concussions, resources to help parents and coaches track symptoms, and videos for kids and teens with advice about safe play in contact sports.	CATT promotes good concussion management to decrease the risk of brain damage and potentially reduce long-term health issues. It will help children recover from concussions and help prevent recurrent concussions, which can cause severe disability or even death. Among parents with a child registered in organized sport, CATT has demonstrated a statistically significant increase in concussion knowledge. Among medical professionals, CATT has demonstrated a statistically significant increase in practices among physicians and nurses.	Patient: Delay of disease progression/survival Patient: Improvements in timely access to care System: Process of care-standardization
A CFRI researcher and other international experts in childhood disability developed the International Classification of Functioning, Disability and Health Core Sets for Children and Youth (ICF-CY) with Cerebral Palsy (CP). The ICF-CY is a common framework for describing functioning and disability in children and youth created by the World Health Organization (WHO). This framework helps doctors and health professionals from all over the world describe, in a systematic way, the functioning and disability of children and youth with CP, the leading cause of severe physical disability in childhood. The ICF-CY for CP was published in Developmental Medicine & Child Neurology (February 2015).	The International Classification of Functioning, Disability and Health Core Sets for Children and Youth with Cerebral Palsy (CP) has created a universal reference guide for describing children and youth with CP. It allows researchers and health care professionals to collaborate on research, develop treatment plans, and evaluate treatment outcomes.	Patient: Protocols and guidelines System: Process of care-standardization
Until very recently doctors had limited information to provide to families about the treatments and prognosis for juvenile idiopathic arthritis (JIA). New research from CFRI, BC Children's Hospital, and pediatric rheumatology centres across Canada showed that modern treatments JIA are highly effective – providing doctors with evidence and reassurance they can now provide to their patients and their families. The five-year national study of 1,104 children newly diagnosed with JIA was published in the Annals of the Rheumatic Diseases (May 2014).	Doctors now have more evidence to share with their patients and their families about the effectiveness of modern treatments for JIA. Research shows that modern treatments result in a 50% chance of remission within 5 years of diagnosis (unless they suffer from polyarthritis, a severe type of JIA). The findings provide hope and reassurance to children and their families diagnosed and living with JIA.	Patient: Delay of disease progression/survival
Recommendations for measuring protein quality in foods were developed by a group of international nutrition experts that included a CFRI researcher. The recommendations were published in a Food and Agricultural Organization (FAO) of the United Nations	The FAO recommendations for evaluating protein quality will help ensure children at BC Children's Hospital and other treatment centres receive a well-balanced diet, tailored to fuel growth and recovery.	Patient: Protocols and guidelines System: Process of care-standardization

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
report titled, 'Research approaches and methods for evaluating the protein quality of human foods' (March 2015).		
Hypertensive disorders of pregnancy like preeclampsia can lead to grave complications for babies, such as preterm delivery and stillbirth. A review of existing research led to the publication of evidence-based guidelines for treating and managing hypertensive disorders of pregnancy in Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health (April 2014).	Evidence-based guidelines for the diagnosis, evaluation and treatment of hypertensive disorders during pregnancy will result in improved outcomes for mothers and their babies.	Patient: Protocols and guidelines Patient: Delay of disease progression/survival
Research from a 15-country, multicenter randomized controlled trial on the control of hypertension in pregnancy study (the 'CHIPS Trial') published in the New England Journal of Medicine (February 2015) revealed that treating elevated blood pressure during pregnancy is safer for the mother and safer for the baby.	New recommendations for treating hypertension in pregnancy are safer for mothers and babies, and will result in better outcomes for babies – before and after birth.	Patient: Protocols and guidelines Patient: Delay of disease progression/survival
Molecular genetics laboratories have historically required large amounts of blood to conduct DNA testing. In 2015, verification of a technique using new technology showed smaller amounts of blood can now be used to conduct genetic tests.	New technology for DNA testing has reduced the amount of blood needed to be taken from children to get the same results. This makes DNA testing safer for babies and toddlers, especially those in the Neonatal Intensive Care Unit. The new method also reduces the cost of DNA tests and means equipment will need to be replaced less frequently.	Patient: other type (improved safety) System: Process of care-protocol implementation Patient: Access to new treatment/technology
Medical guidelines for the prevention and management of hypoglycemia (low blood sugar that can result in confusion loss of consciousness, seizures or death) in First Nation infants and youth were published, together with a parent resource called, "Preventing low blood sugar in health First Nations babies and young children". Both resources are available on the Child Health BC website. These guidelines were developed in response to requests from coastal First Nations communities and their doctors, where a particular type of hypoglycemia is common.	The medical guidelines and parent resource provide evidence-based recommendations for the prevention and management of hypoglycemia in BC First Nations infants and young children. They are designed to help support families with children who have this condition.	Patient: other type (improved safety through disease prevention and management) Patient: Protocols and guidelines
New methods for diagnosing metabolic disorders like Phenylketonuria (PKU), Tyrosinemia I and Maple Syrup Urine Disease were implemented by the BC Children's Biochemical Genetics Lab. The introduction of amino acid profiling using mass spectrometry has reduced the time required to test biological samples. Samples are sent to the lab for testing	Amino acid profiling using mass spectrometry has greatly improved genetic laboratory testing capacity. In addition, the average turn-around time for samples was reduced to 7 days in 2015 from 24 days in 2013, despite a 25% increase in the number of samples (approximately 5,000 in total).	Patient: other type (improvements access to timely care) System: Efficiency, cost/benefits or sustainability

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
from across the province.		
A new diagnostic test that better detects fetal abnormalities was implemented in February 2015. The 'prenatal chromosome microarray' technique is used during ultrasounds and provides a clearer picture than the previous conventional technique (called 'karyotyping'). Using the new technique, families are able to get results faster, in 8-10 days compared to 14 days previously.	The improved diagnostic technique used to test for fetal abnormalities provides greater detection and faster results to parents. The 'prenatal chromosome microarray' test is less costly than the previous conventional method.	Patient: Improvements in timely access to care System: Efficiency, cost/benefits or sustainability
Research published in Cell Host & Microbe (August 2014) has shown how the gut protects our bodies from infections that may cause inflammatory bowel disease (IBD). Every year, approximately 100 children are diagnosed with IBD at BC Children's Hospital. There is currently no cure for IBD, and this diagnostic finding paves the way for targeted therapies.	These findings support clinicians working with children who suffer from the painful and potentially traumatic effects of IBD to explore therapies for this presently incurable disease.	Patient: Other type (Directional research)
Clinical practice guidelines for non-operative management of developmental dysplasia of the hip (DDH) in infants up to 6 months of age were approved in September 2014 and published on the American Academy of Orthopaedic Surgeons website.	The developmental dysplasia of the hip (DDH) guidelines include nine recommendations that guide doctors in the treatment of DDH in infants up to 6 months of age, and in ultrasound screening practice. They represent guidelines are a positive step in the standardization and optimization of DDH care.	Patient: Protocols and guidelines
A free, innovative mobile app, 'RRate', allows health care professionals to measure respiratory rate more accurately. In addition to calculating the rate of inhalations during a given time, the app also provides an animation of a breathing baby, providing a direct comparison with the breathing patient. These research findings were published in PLOS One (February 2015)	The RRate app allows health care professionals to measure respiratory rate over 6 times faster (in approximately 10 seconds versus 60 seconds for the conventional method). Measures of respiratory rate are used to diagnose respiratory illnesses in children like pneumonia.	Patient: Access to new treatment/technology
Research has shown that modern anesthesia is safe for most children with a genetic heart condition called Long QT Syndrome (LQTS). The results of the multi-centre study were published in Anesthesia & Analgesia (October 2014). Because anesthesia drugs can trigger dangerous side-effects for people with LQTS, there was little research on best practices for caring for patients with LQTS when they undergo anesthesia. This research study, conducted on the largest dataset set to date from eight children's hospitals across North America, found that surgery is safe for children with known LQTS who are receiving treatment.	Children with LQTS are now able to safely undergo anesthesia.	Patient: other type (improved safety) Patient: Protocols and guidelines System: Process of care-protocol implementation
Discovery of the gene that causes Adams-Oliver	This gene discovery improves diagnosis of	Patient: Delay of disease

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
syndrome (AOS), a rare and potentially fatal genetic disorder, allows doctors to now confirm the diagnosis of this disorder more easily, and diagnose it in children who do not have all the usual symptoms. The gene discovery is published in the American Journal of Human Genetics (August 2014)	the rare disorder AOS, and for patients with unexplained symptoms, it prevents unnecessary testing and helps children get the care they need sooner.	progression/survival

BC Mental Health and Substance Use Services (BCMHARI)

Producing and Advancing Knowledge

In FY 2014-15, researchers associated with BCMHSUS, including researchers at BCMHARI, were awarded a total of $2,796,321 a decrease of 10% from FY 2013-14. The variation is attributed to significant decreases in grants in aid. Operating grants and Salary awards both increased from the previous year's totals and are representative of historical levels. A breakdown of funding types and subtypes can be found in Figure 37. BCMHSUS's portion of the Indirect Costs Program grant totaled $192,837.28 for FY 2014-15 but is not included in total research funding or the figures below.

Figure 37

BCMHSUS Research Funding by Funding Type and Sub-type by Fiscal Year

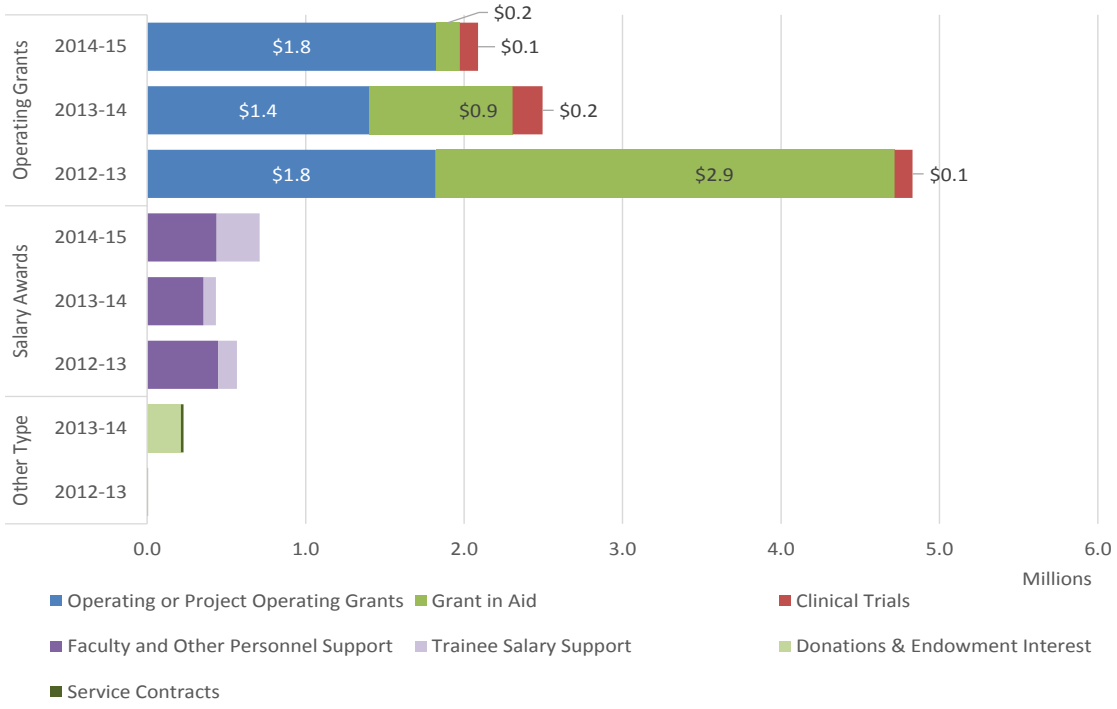


Figure 38

Percentage of BCMHSUS Research Funding by Funding Source Category by Fiscal Year

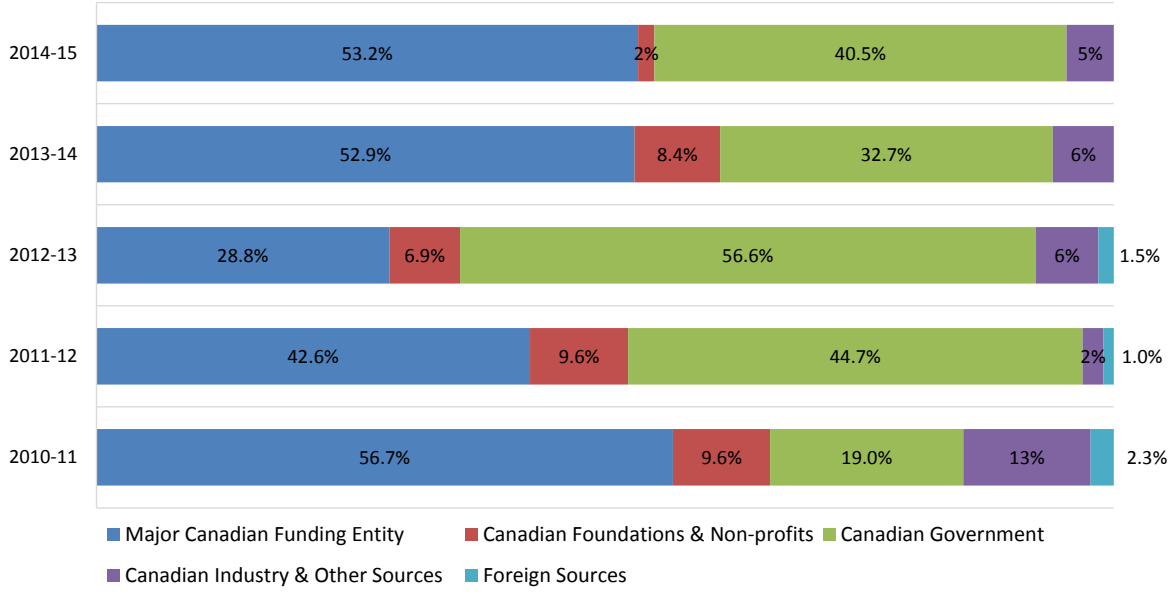
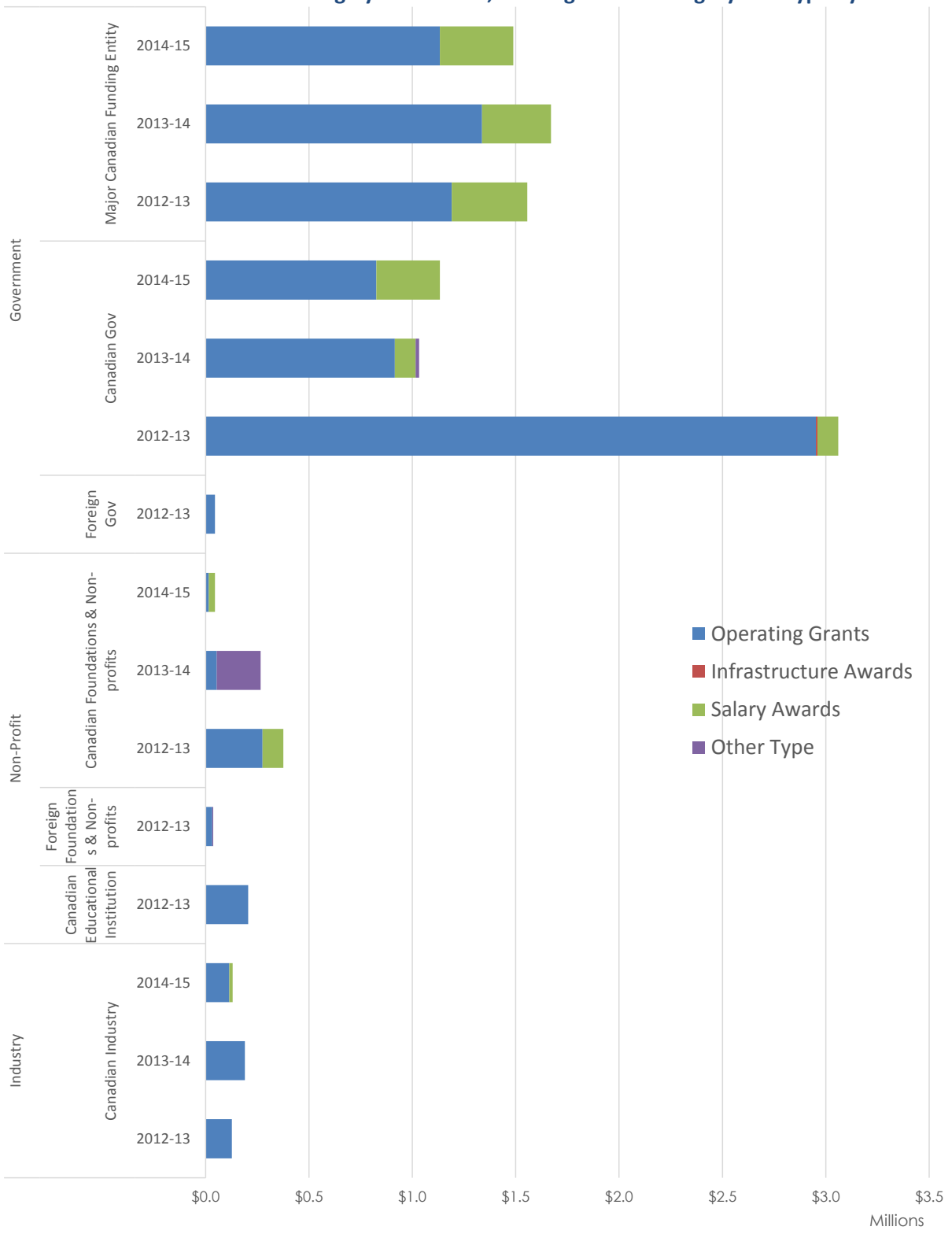


Figure 38 shows total awards by funding source category. The top two funding categories are Major Canadian Funding Entity (53.2%) and Canadian Government (40.5%). Figure 39 details the major funding categories by RISe sector, funding source category and funding type.

Figure 39

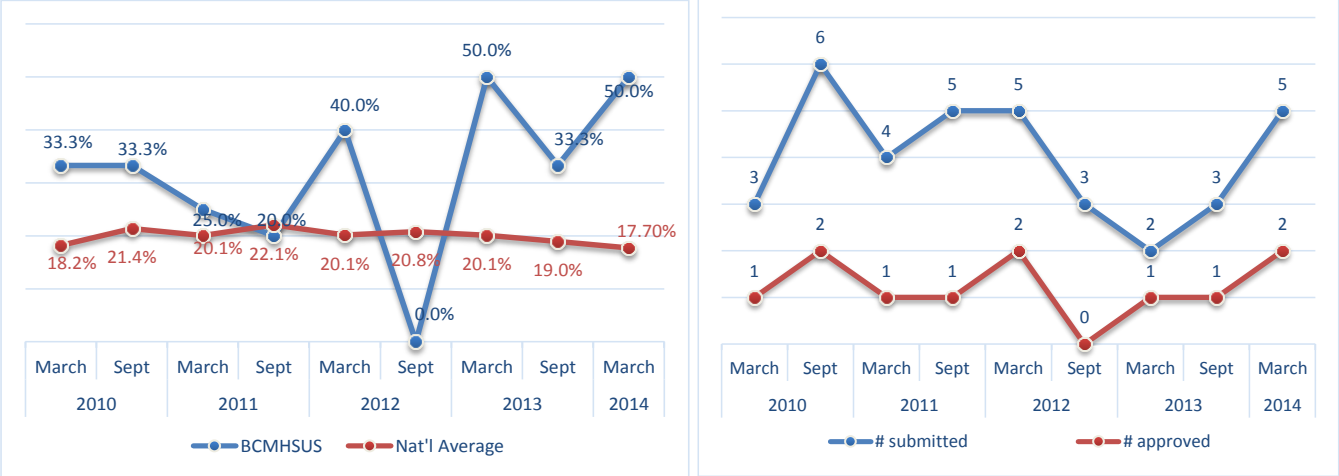
Total BCMHSUS Research Funding by RISe Sector, Funding Source Category and Type by Fiscal Year



BCMHSUS has exceeded the national average in 7 of the last 9 CIHR operating grant competitions including the March 2014 competition. Figure 40 below shows competition success rates and number of applications submitted and approved over the past 5 years.

Figure 40

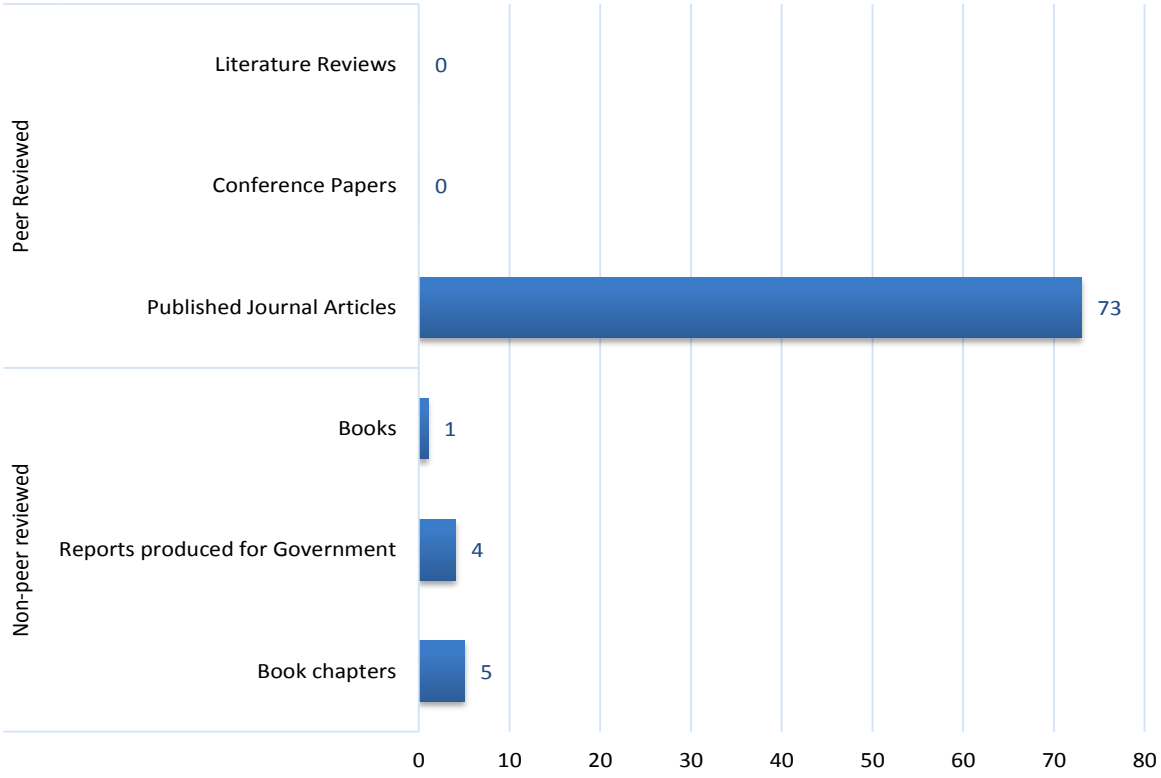
BCMHSUS's CIHR Operating Grant Application Success Rate & Number of Applications Submitted/Approved



BCMHSUS had a total of 83 publications in the 2014 calendar year of which 88% were peer reviewed. Total number of publications by type and category (peer vs. non-peer reviewed) is seen in Figure 41. The agency total represents the number of publications where at least one agency researcher was an author of the publication. When researchers from more than one research entity/agency collaborate on the same publication, it is counted once for each agency.

Figure 41

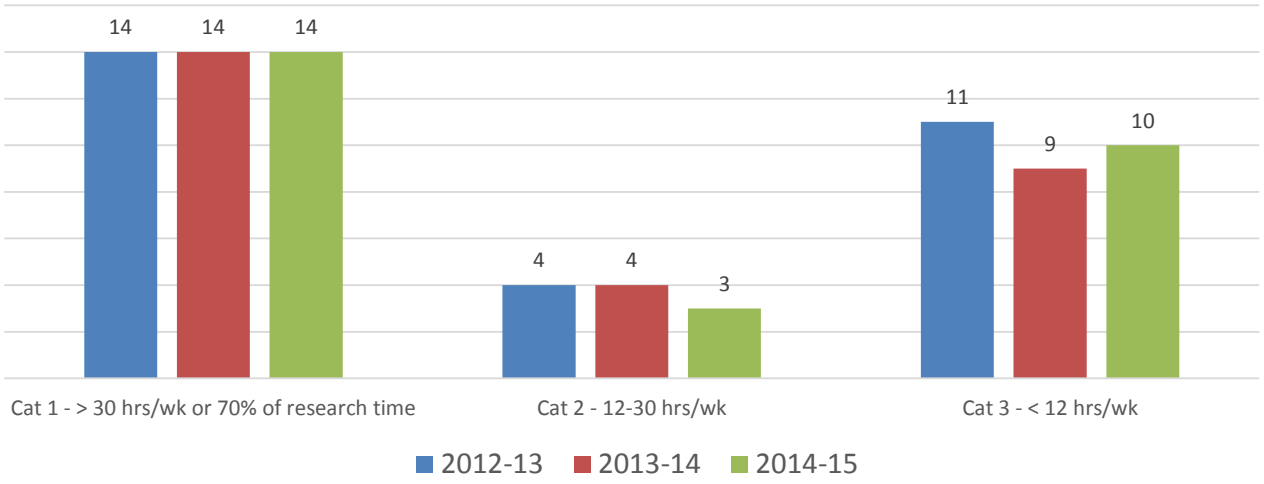
Total Number of BMHARI Publications by Type and Category



Building Research Capacity

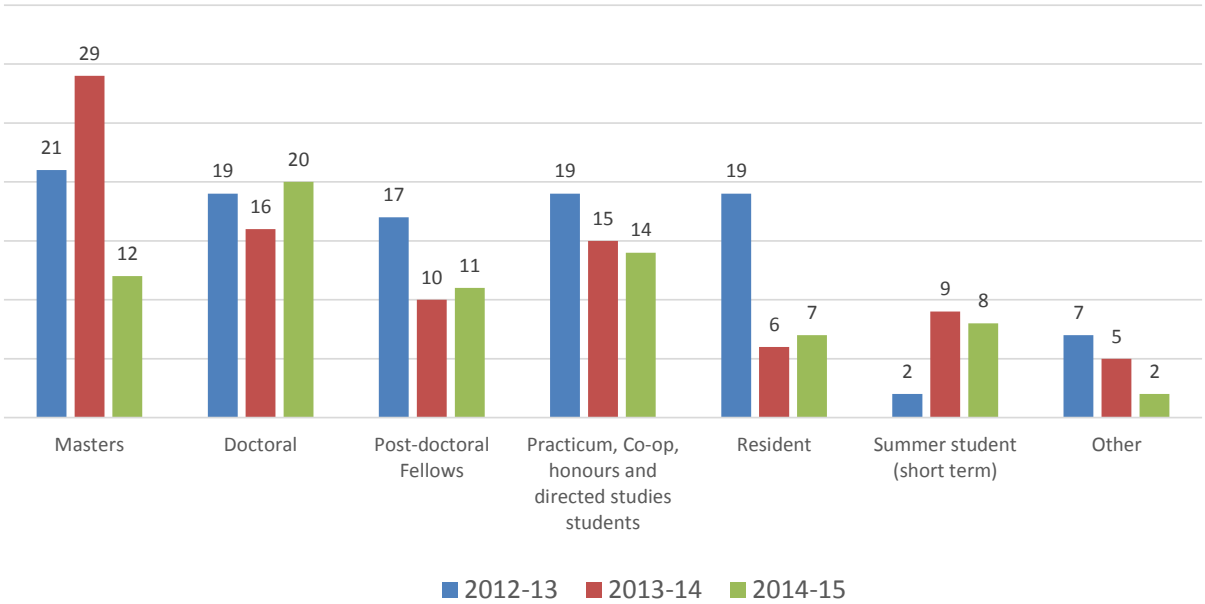
BCMHSUS had a total of 27 researchers in FY 2014-15, with 14 having greater than 30 hours or 70% protected research time per week (Figure 42). This includes researchers in BCMHSUS specialized program areas, as well as investigators conducting research at the BCMHARI, situated on the third floor of the Translational Research Building located on the Children's & Women's Health Centre of British Columbia (C&W) campus. BCMHSUS continues to attract nationally and internationally recognized researchers to its research facility situated on the third floor of the Translational Research Building located on the Children's & Women's Health Centre of British Columbia (C&W) campus. BCMHSUS is committed to integration of clinical and research activities that will lead to evidence-informed change of practice and system-wide improvements. In addition to the investigators, post-doctoral fellows, graduate students, research assistants, and technicians supporting the research enterprise at BCMHSUS, many clinicians and front line staff also participate in research programs.

Figure 42
Total Number of BCMHSUS Researchers by Category



During FY 2014-15, BCMHSUS researchers provided training and supervision to a total of 74 trainees which was down by approximately 17% from previous year. While overall trainee head count decreased, there is variation across trainee categories with Masters Students decreasing the most of any category (see Figure 43).

Figure 43
Total Number of BCMHSUS Trainees by Category



Advancing Health and Policy Benefits

Clinical trial data is provided for a second year utilizing the same methodology as last year. See Table 9 for a detailed breakdown of clinical trial activity by fiscal year. Of note is that approximately 38% of BCMHSUS trials had no enrollment figures which is an improvement over last year's 48%. Once these fields are made mandatory as opposed to optional, as they now are, enrollment figures should increase.

Table 9
BCMHSUS Clinical Trials

	11-12	12-13	13-14	14-15
Total Number of Clinical Trials active during the FY	9	10	7	5
Status of the Trial at the end of the FY:				
Total Number of Active Trials	9	10	7	5
Total Number of Trials that closed during the FY	6	5	2	0
Enrolment Numbers:				
Expected Local Subject Enrolment (for the term of the study)	618	828	688	563
Total Cumulative Subject enrolment at the end of the FY	323	16	56	77

Table 10 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2014-15 as a result of research driven by BCMHSUS researchers, and their corresponding benefits. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 10

BCMHSUS Outcomes Survey Responses

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
Clinician-researcher Dr. Roger Freeman published a book "Tics and Tourette Syndrome: Key Clinical Perspectives". The book was based on 10 years of research and clinical practice and provides an extensive discussion of tic disorders occurring alone or co-occurring with mental illness. The book provides practical advice for clinicians in improving the management of their patients.	The uptake of this book will provide clinicians with evidence-based strategies for managing patients and will improve patient-related outcomes through improved diagnosis and application of evidence-based treatment and illness management strategies.	**Patient:** Protocols and guidelines **System:** Knowledge dissemination-new policy
In 2014/2015 the Short Term Assessment of Risk & Treatability (START) has continued to be supported throughout the Forensic Psychiatric Hospital and regional clinics. The START continues to gather international momentum with the release of the German translation in early 2015. To date there have been greater than 30 publications about the START including a meta-analysis in 2014. It was considered one of the most useful outcome measures in mental health (Shrinkfield & Ogloff, 2014) and one of the most useful violence risk assessment tools (IRiS study; Nicholls et al., in press; Singh et al., in press).	The ultimate objective of the START is to prevent adverse events and support rehabilitation and community (re)integration of diverse inpatient and community populations (corrections inmates/probationers, and forensic and civil psychiatric patients). Reports supporting the reliability and validity of this tool may increase its uptake in appropriate populations.	**Patient:** Protocols and guidelines **System:** Process of care-protocol implementation
As reported in prior years, interest in the START led to the development of an adolescent version. The Short Term Assessment of Risk & Treatability-Adolescent Version (START-AV) was released in 2014. The team held a START-AV workshop at the International Association of Forensic Mental Health in June 2014. Throughout the past year it has been implemented into practice internationally. For example, The Ontario School Board has begun to utilize the measure, in the Netherlands it is being used in civil psychiatric inpatient practice, and it is being used in juvenile justice setting in the US.	The objective of the START-AV is to prevent adverse events and support treatment planning for adolescent mental health populations, including both civil mental health and justice populations.	**Patient:** Protocols and guidelines **System:** Process of care-protocol implementation
A team of BCMHSUS researchers co-authored a paper which described a protein-protein interaction in the brain in schizophrenia that is now a target for drug development. A project is now underway with the Centre for Drug Research and Development (CDRD) and another investigating the mechanism of psychosis as a side effect of anti-malarial drugs is underway in collaboration with the University of Cape Town.	Currently available antipsychotic drugs are effective in reducing symptom severity, and in preventing relapse. However, up to one-third of patients have a poor response to these drugs. Novel approaches are needed, that go beyond the targets of presently available drugs, and the strategy developed may be successful in the search for innovative treatments.	**Patient:** Access to new treatment/ technology
Five publications co-authored by BCMHSUS researchers reported on the results of clinical trials and audits that will contribute to meta-analyses and guideline development in the future.	Guidelines and "best practices" rely on careful studies including controlled trials and practice audits. This work focused on patients with serious mental illness, genetic counselling for mental illness, and prescribing practices in children will make meaningful contributions to guideline development.	**Patient:** Protocols and guidelines **System:** Process of care-standardization

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
BCMHSUS researchers co-authored three publications describing assay development for research purposes, which may be clinically applicable in future, including the development of a cost-efficient model for rapid, concurrent genotyping.	Low cost, rapidly available laboratory tests that can contribute to targeting medications in a personalized manner to increase efficacy and reduce side effects are needed. This research contributes to those efforts.	**Patient:** Access to new treatment/ technology **Patient:** Improvements in timely access to care **System:** Efficiency, cost/benefits or sustainability
BCMHSUS researchers co-authored a paper analyzing pharmacological treatment of antipsychotic-induced dyslipidemia and hypertension.	The uptake of these report findings will improve the quality of patient care by reducing medication side effects. Cost savings may also be realized related to pharmaceutical use.	**Patient:** Protocols and guidelines **System:** Efficiency, cost/benefits or sustainability
A team of BCMHSUS researchers co-authored a paper with reviewed the management of ADHD and disruptive behaviours through combination psychostimulant and antipsychotic treatments.	The uptake of these report findings will improve the quality of patient care through symptom reduction.	**Patient:** Access to new treatment/ technology
Research into the effects of prescribed regular exercise in chronic schizophrenia inpatients determined that despite high-dose medication and acute severity of symptoms, engagement in exercise in this patient population is possible and warranted. Guidelines for exercise specific to the needs of this population have been created, and the research team is pursuing the implementation of a permanent clinical exercise program for all Provincial Refractory Psychosis inpatients as an effective and cost-conscious way to improve mood and cardio-vascular deficits in these vulnerable patients. The team hopes to expand this program to patients with bipolar disorder, depression and anxiety, and to model the in-hospital exercise program for psychiatry patients across sites in the BC Lower Mainland.	Study participants experienced improved cognition and corollary improvements in fitness, anxiety and better weight management. Uptake of the guidelines developed can improve patient quality of life, and ameliorate some of the side effects of antipsychotic medications.	**Patient:** Access to new treatment/ technology **Patient:** Protocols and guidelines
Novel interventions of mindful behavioural parent training and sensory-motor-based strategies for self-regulation for children with ADHD have resulted from research projects.	Clinical outcome benefits to patients and families, and manualization of interventions will benefit community service providers to implement evidence-based programs.	**Patient:** Protocols and guidelines **System:** Process of care-standardization
BCMHSUS researchers developed the *Clinical guide for the BC – Ambulance Risk Stratification Tool (BARSTOOL)* provides evidence-based direction for the appraisal of risk for problematic behaviour during the transport by air of persons with mental illness. The BARSTOOL and accompanying sedation protocols guided the implementation of a pilot project in BC. Formal evaluation of the pilot project indicated good outcomes and support for the recommendation that the BARSTOOL be implemented across British Columbia.	Reduction in adverse events and improved patient outcomes.	**Patient:** Protocols and guidelines **System**: Process of care-protocol implementation

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
In response to an identified service gap for individuals with complex co-occurring disorders and associated behavioural challenges (e.g., violence, suicide, crime, repeated contact with police, emergency department visits), BCMHSUS was charged with improving the continuum of care for this population. The steering committee has developed the model of care, consulting on issues such as client descriptors, prevalence estimates, and the clinical plan. BCMHSUS researcher Dr. Tonia Nicholls led a systematic review which resulted in the identification of the Level of Care Utilization System (LOCUS) as the preferred tool to match client needs with level of care. She consulted on the development of online training and case studies and will continue to support the implementation and evaluation.	LOCUS is being implemented across BC and will be used throughout the improved continuum of care to evaluate patient needs/bed levels and monitor progress among individuals with severe addictions and mental illness. The objective is to ensure that patients with the greatest needs have access to the appropriate services.	**Patient:** Improvements in timely access to care
BCMHSUS researcher Dr. Tonia Nicholls is the BC lead on a national team investigating individuals found Not Criminally Responsible on Account of Mental Disorder (NCRMD) in BC, ON, and QC. The goal of the National Trajectory Project (NTP) was to provide an in-depth analysis of NCRMD dispositions, focusing on service use, decision-making and outcome. As a result of this project the team has published a Special Issue of Canadian Journal of Psychiatry in addition to several other papers. This project has also resulted in the team receiving a CIHR planning grant allowing them to gather 30 stakeholders (e.g., clinicians, policy makers, Review Board Chairs). At this meeting the group developed an action plan laying out the research priorities for advancing forensic research and practice across Canada.	As a result of the publication of the special issue of CJP the team had many media requests (>30) resulting in newspaper articles and radio interviews wherein the team was able to dispel common myths about mental illness generally and individuals found NCRMD, specifically. The team was contracted by Justice Canada to report on individuals with severe offences to inform the development of new legislation. The NTP team also received an invitation to brief the Commons Committee on their research.	**System:** Knowledge dissemination-new policy
Dr. Nicholls' is first author on the Jail Screening Assessment Tool (JSAT), a manualized mental health screening program (i.e., assess mental disorder, suicide/self-harm, violence/ victimization). She has been consulting on the implementation and evaluation of a two-tiered model for the new Toronto jail mental health program (>10,000 admissions/year). She provided two 1-day workshops to direct care providers (psychology, social work, OT, psych nurses) and consulted with Centre for Addictions and Mental Health, ON on various clinical decisions (BPRS version, management recommendations following intake, consent) to guide the implementation. We are in discussions with the Correctional Service of Canada about a nation-wide implementation in federal prisons.	The JSAT is now used in every pretrial centre in Ontario (26 sites) and continues to be used in every pretrial facility in BC. The JSAT ensures that the inmate population which has a high prevalence of mental health issues is being screened for mental health disorders in a reliable and valid way. Screeners make recommendations for specialized placement (e.g., suicide watch, protective custody), referrals to mental health services (psychiatry, psychology) and health care. The objective is to prevent institutional violence and safety incidents (suicide, violence, victimization, self-harm) and expedite access to mental health care.	**Patient:** Improvements in timely access to care **System:** Process of care-protocol implementation

BC Centre for Disease Control/UBC Centre for Disease Control (BCCDC/UBC CDC)

Producing and Advancing Knowledge

In FY 2014-15, researchers affiliated with BCCDC/UBC CDC were awarded a total of $3,131,515 in research funding. The amount awarded as Operating Grants ($2,036,777) makes up 65% of total awards. A breakdown of funding types and subtypes can be found in Figure 44 and by funding source category in Figure 45. BCCDC's portion of the Indirect Costs Program grant totaled $131,572 for FY 2014-15 but is not included in total research funding or the figures below. Because of its public and population health mandate, research at BCCDC is very much embedded within its clinical mandate and, as such, is also supported by operating funding to a significant degree.

Figure 44

Total BCCDC/UBC CDC Research Funding by Funding Type and Sub-type by Fiscal Year

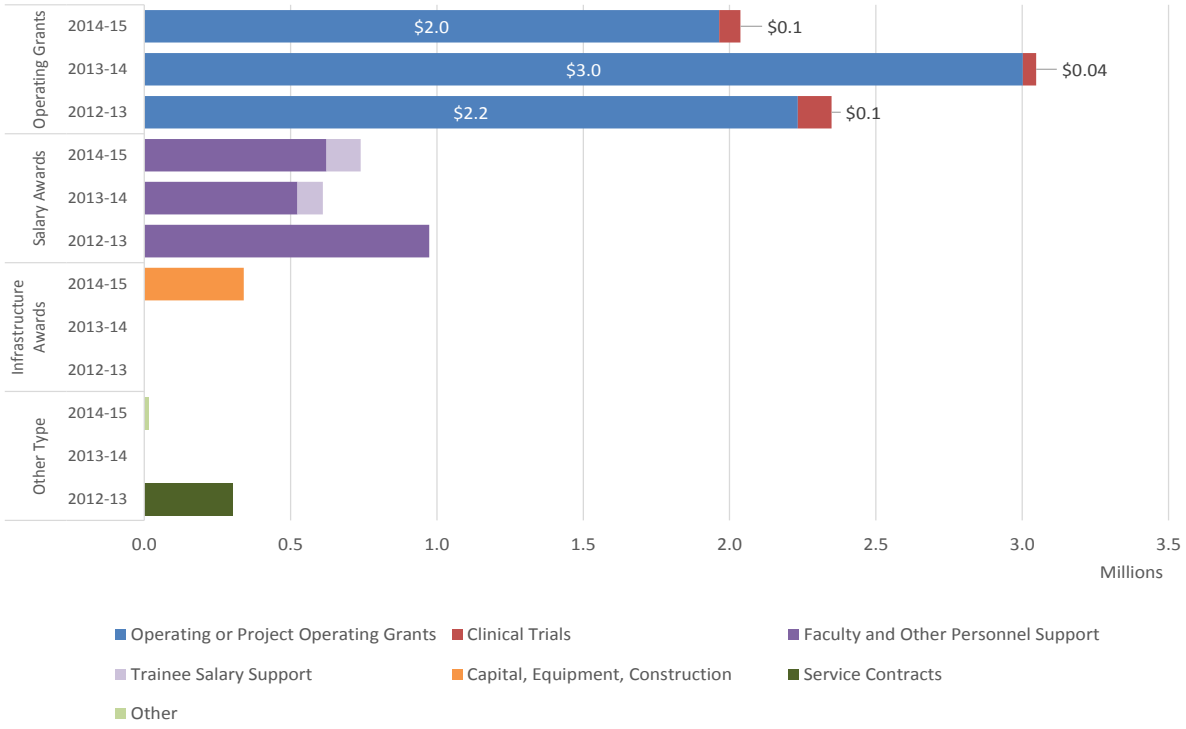
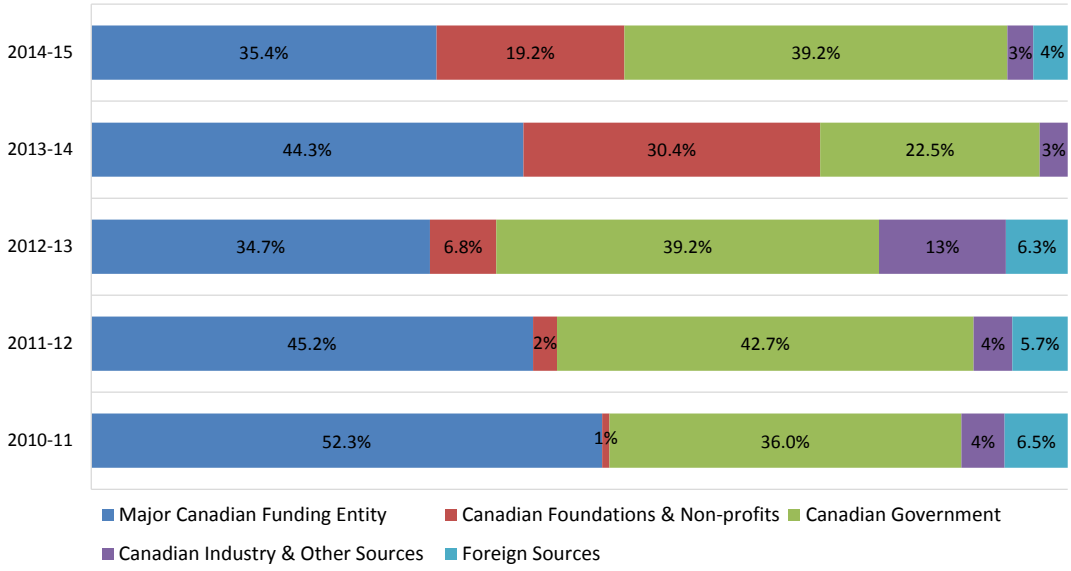


Figure 45

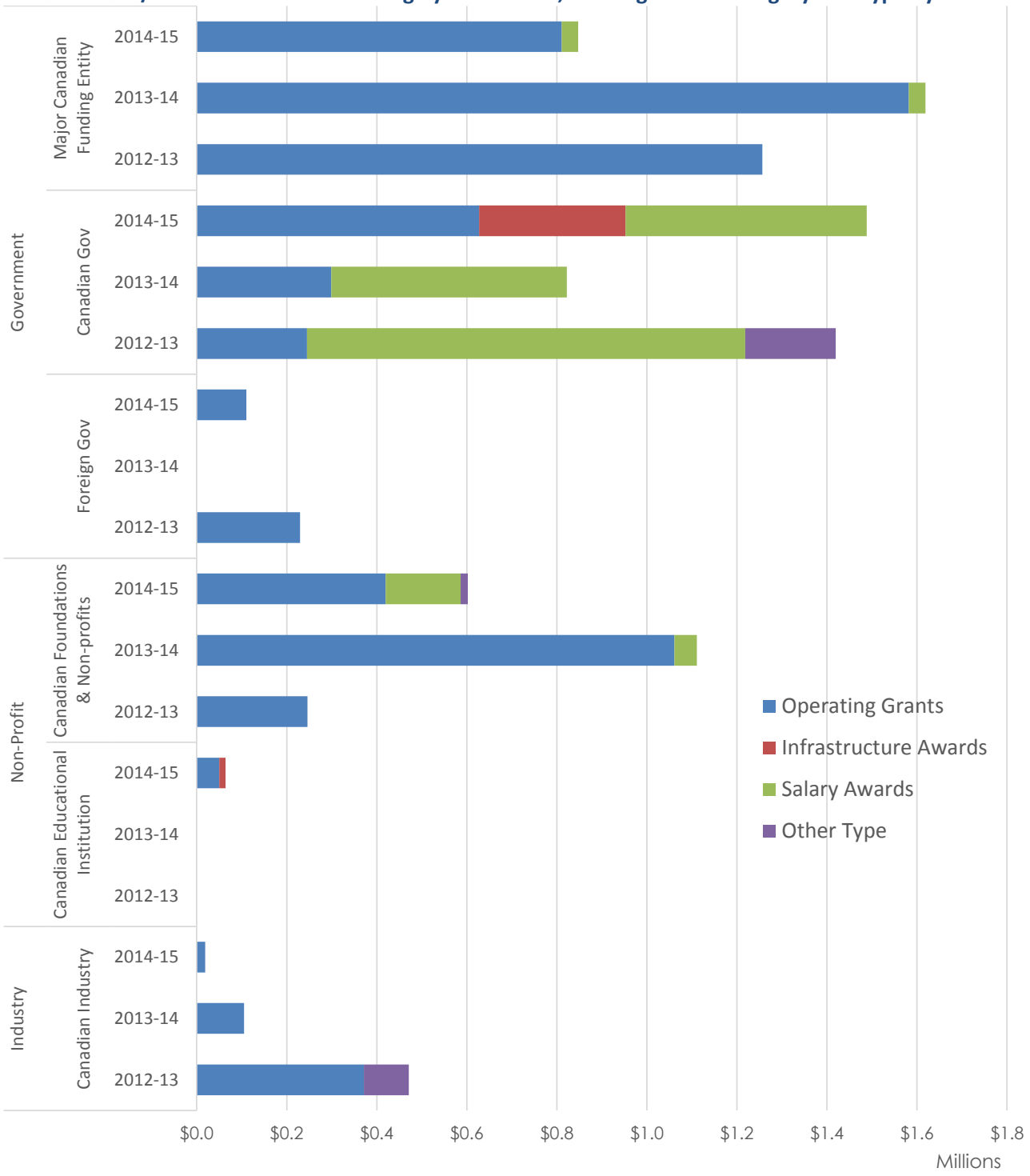
Percentage of BCCDC/UBC CDC Research Funding by Funding Source Category by Fiscal Year



The top two funding categories are Canadian Government (39.2%) and Major Canadian Funding Entity (35.4%) and Figure 46 details the RISe sector and major funding categories by funding type.

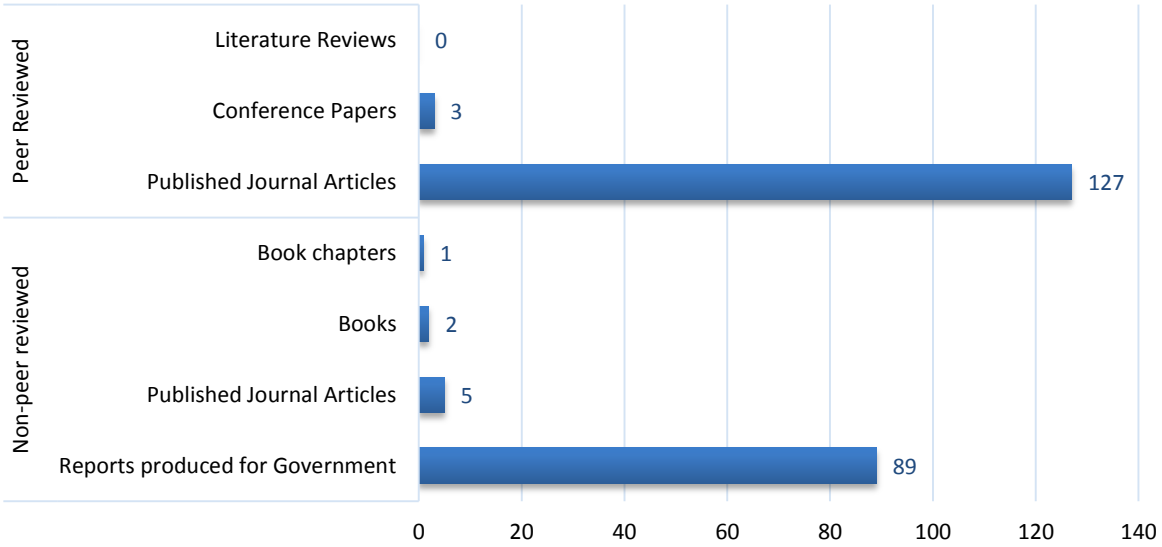
Figure 46

Total BCCDC/UBC CDC Research Funding by RISe Sector, Funding Source Category and Type by Fiscal Year



BCCDC had a total of 227 publications in calendar year 2014 of which 56% were peer reviewed. Total number of publications by type and category (peer vs. non-peer reviewed) is seen in Figure 47. The agency total represents the number of publications where at least one agency researcher was an author of the publication. When researchers from more than one research entity/agency collaborate on the same publication, it is counted once for each agency.

Figure 47
Total Number of BCCDC/UBC Publications by Type and Category

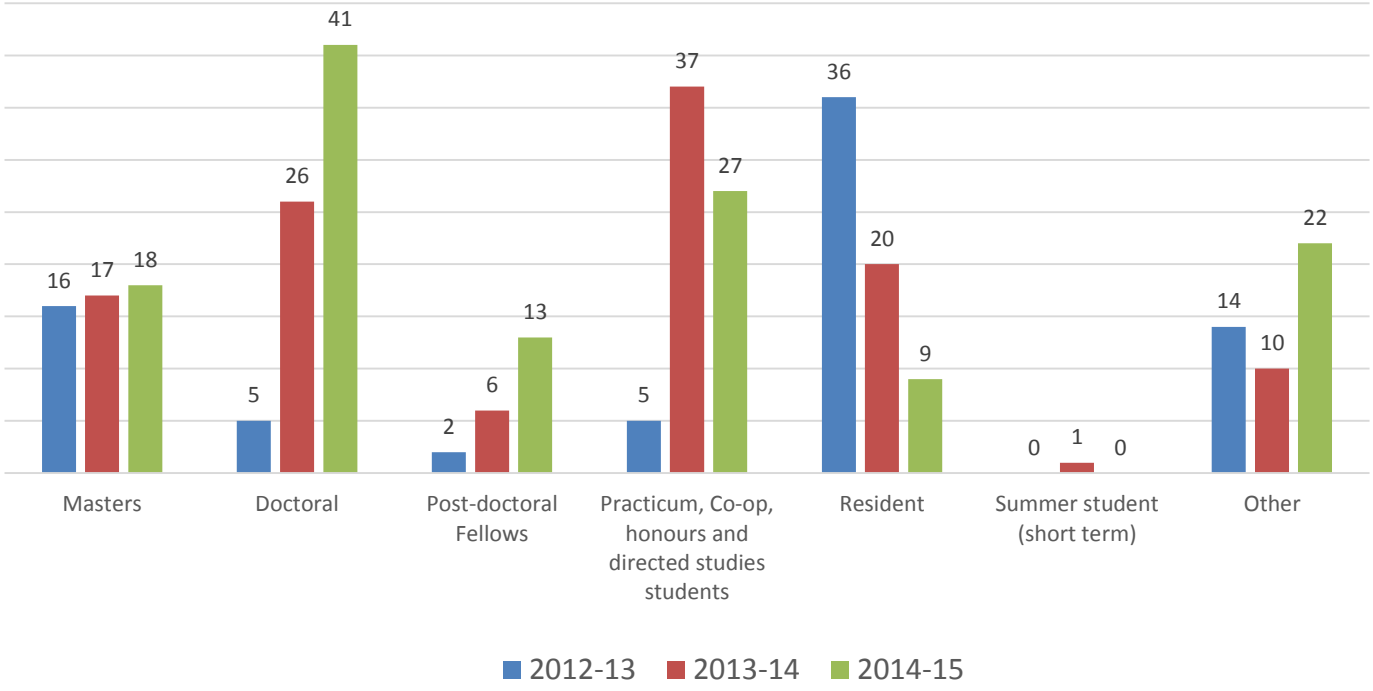


Building Research Capacity

BCCDC/UBC CDC defines a researcher as any principal investigator or co-investigator involved in BCCDC/UBC CDC research projects. BCCDC had a total of 34 researchers meeting this definition in FY 2014-15.

During FY 2014-15, BCCDC/UBC CDC researchers provided training and supervision to a total of 130 (up 13 from FY 2013-14) trainees (see Figure 48). The largest increase is seen in the doctoral and post-doctoral and other categories.

Figure 48
Total Number of BCCDC/UBC CDC Trainees by Type



Achieving Economic Benefits and Innovation

While BCCDC had no new patent activity for FY 2014-15, applications filed in previous fiscal years related to the Chlamydia vaccine have been assigned to BCCA and future activity will be included in their agency section.

Advancing Health and Policy Benefits

Clinical trial data is provided for a second year utilizing the same methodology as last year. See Table 11 for a detailed breakdown of clinical trial activity by fiscal year.

Table 11
BCCDC/UBC CDC Clinical Trials

	11-12	12-13	13-14	14-15
Total Number of Clinical Trials active during the FY	2	2	2	3
Status of the Trial at the end of the FY:				
Total Number of Active Trials	2	2	2	3
Total Number of Trials that closed during the FY	0	0	0	0
Enrolment Numbers:				
Expected Local Subject Enrolment (for the term of the study)	532	532	532	401
Total Cumulative Subject enrolment at the end of the FY	203	325	55	157

Table 12 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2014-15 as a result of research driven by BCCDC/UBC CDC researchers, and their corresponding benefits. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 12
BCCDC/UBC CDC Outcomes Survey Responses

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
Production of new educational video to address overuse of antibiotics in dentistry.	Reduce costs and side effects of unnecessary antibiotic use. Reduce selection of resistant strains.	Patient: Protocols and guidelines
Publication of BC based study that points out the inaccuracy of alternative testing for Lyme disease in for-profit US labs.	With further translation, we hope that fewer patients are misled into an inaccurate diagnosis that delays real diagnosis and leads to harmful unnecessary and costly treatment.	Patient: Other type
BCCDC Public Health Labs lead national team exploring new bio-markers for water quality and developing guidelines for the introduction of new microbial genomics and other molecular tools	More accurate approach to safe drinking water for communities world-wide	Patient: Protocols and guidelines
The pharmacists, nurses and physicians in the BC Drug and Poison Centre completed the fifth edition of the Poison Management Manual. The BC Drug and Poison Centre is part of the Environmental Health Service Line at the BCCDC. The manual was published on March 30 2015. The manual is a two volume 828 page compilation of 300 monographs on the treatment of frequently encountered poison exposures and poison and drug overdoses commonly associated with poor outcome. Each guideline is based on an extensive literature review. The complete manual is available in print and electronic versions and individual monographs are provided by fax or email to aid in the care of patients.	The use of this manual will optimize and harmonize the care of drug overdose and poisoned patients in BC. Treating drug overdose patients requires specialized knowledge. Providing physicians with optimal management for drug overdose patients has been shown to improve outcomes and decrease length of stay resulting in considerable health care savings.	Patient: Protocols and guidelines
BC Treatment Guidelines for STIs	Recommendations for the treatment of STIs in BC, based on evidence and local surveillance data	Patient: Protocols and guidelines
Development of the decision support tool for naloxone dispensing by registered nurses. Opioid overdose from prescription and illicit opioids is a concerning public health issue. There were over 350 illicit drug overdose deaths in 2014 in BC and in the past 3 years there has been increasing overdoses related to fentanyl a powerful opioid many times more potent than morphine. The take home naloxone program was introduced by BCCDC in August 2012 to train people how to prevent, recognize and respond to opioid overdoses including administering	As nurses, if approved by their employer, can now dispense naloxone without a physician or nurse practitioner prescription there will be greater access for those at risk of an opioid overdose to receive take home naloxone and hence potentially lead to more people being able to carry and administer naloxone.	Patient: Improvements in timely access to care

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
naloxone. The program has been recognized as a leading practice by accreditation Canada. However, as naloxone is a prescription only medication our ongoing research and evaluation identified the availability of kits was limited especially in rural areas by the need for patients to be seen by a physician or nurse practitioner to prescribe a kit. During financial year 2014/15 the harm reduction team in immunization services and in collaboration with stakeholders throughout the province, led the development of a decision support tool (DST) that will permit registered nurses to dispense naloxone to treat a suspect opioid overdose. The College of Registered Nurses of BC (CRNBC) Nursing Practice Committee approved the submission in March 2015 and the Board approved limits and conditions of the DST.		
Twice each year (September and February), the WHO organizes consultations with an advisory group of experts to analyze influenza virus surveillance and research data, and to disseminate timely guidance to regulatory authorities and vaccine manufacturers for reformulation of influenza vaccine products globally. The BCCDC-led Sentinel Practitioner Surveillance Network (SPSN) contributes surveillance and research findings to this WHO committee. Real-time, pre-publication submission of detailed virologic and vaccine effectiveness findings by the BCCDC-led SPSN, in partnership with international collaborators through the Global Influenza Vaccine Effectiveness (GIVE) network, directly informed WHO recommendations for influenza vaccine reformulation for the Southern Hemisphere in September 2014 and for the Northern Hemisphere in February 2015. BCCDC-led SPSN findings are also published in peer-reviewed scientific journals.	Influenza vaccine components must be periodically revised to still be protective against constantly evolving circulating strains. WHO recommendations are used by national vaccine regulatory agencies and pharmaceutical companies globally to develop, produce and license new influenza vaccines that are administered to hundreds of millions of people every year in each hemisphere. Findings from the BCCDC-led SPSN thus impact the health of vulnerable people worldwide.	Patient: Access to new treatment/technology Patient: Protocols and guidelines System: Knowledge dissemination-new policy
Unprecedented identification of early summer/fall LTCF outbreaks and detailed genetic and antigenic characterization of influenza viruses by the BCCDC's Influenza and Emerging Respiratory Pathogens' team directly contributed to urgent communications about virus drift, vaccine mismatch, reduced vaccine effectiveness and the need for adjunct protective measures. This led to national guidelines for expanded antiviral use for control of LTCF influenza outbreaks by the Canadian Association of Medical Microbiologists and Infectious Disease Specialists (AMMI) to which Dr. Skowronski was a contributing expert and author. Predicated on knowledge also disseminated through BCCDC Influenza Surveillance Bulletins, 2014-15, with examples of	Early recognition during the summer/fall 2014 of mutations in the circulating influenza virus and genomic analyses that correlated these changes with reduced vaccine effectiveness enabled BCCDC to engage in broad communication about adjunct protective measures for the most vulnerable. This included real-time revised national guidelines for expanded antiviral use in the control of long-term care facility outbreaks and treatment of	Patient: Delay of disease progression/survival through enhanced use of antivirals and awareness about early treatment for high-risk individuals Patient: Protocols and guidelines

Please describe any guideline, drug, diagnostic agent or device adopted or approved in 2014/15 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit
public health alerts/bulletins related to early season activity and vaccine mismatch, and media communications to the public about how to protect themselves in that context:	high-risk individuals.	System: Knowledge dissemination-new policy
Influenza is a respiratory infection caused by influenza A or B viruses. Influenza viruses are constantly evolving to evade immunity in the population and, for this reason, influenza vaccine and program recommendations must be updated each year. In its 2014-2015 updated statement on seasonal influenza vaccine, Canada's National Advisory Committee on Immunization (NACI) cited eight scientific papers published by the BCCDC Influenza & Emerging Respiratory Pathogens Team. This includes references incorporating knowledge contributed by BCCDC studies related to: Vaccine immunogenicity and durability in elderly recipients, including implications for adjuvant technology, same-season booster dose options, and altered timing of elderly immunization each fall; Influenza B cross-lineage vaccine responses and implications for quadrivalent influenza vaccine recommendations; Vaccine dose-responses in infants and toddlers leading to recommendations for higher per-dose antigen content in the young; Human illness due to novel emerging avian influenza viruses, including H7 subtype with implications for protective measures during poultry outbreaks; Age-related disease burden due to influenza with implications for vaccine program prioritization	The influenza immunization program is the largest and most intense vaccine program in Canada – including administration of more than 12 million doses every year within a narrow 6-8 week period. Through a spectrum of surveillance and applied public health research activities, the BCCDC Influenza & Emerging Respiratory Pathogens Team is contributing to improved influenza vaccine program effectiveness and efficiency across a range of national needs and recommendations.	Patient: Delay of disease progression/survival Patient: Protocols and guidelines System: Efficiency, cost/benefits or sustainability System: Knowledge dissemination-new policy
Pertussis is a respiratory pathogen that is associated with cyclical outbreaks every 2-5 years. Infants less than 3 months of age are at highest risk of severe pertussis illness, including ICU admission and death. However, newborns cannot be directly immunized against pertussis. Alternative vaccine program options to indirectly protect newborns have been proposed, including "cocoon" immunization of mothers, fathers and other close household contacts to build a "wall of protection" around the baby as well as maternal immunization to reduce transmission from mother-to-child and to facilitate passive antibody transfer to the newborn. Canada's National Advisory Committee on Immunization (NACI) incorporated research published by BCCDC in its updated 2014 guidelines for Pertussis Vaccination in Pregnancy.	By showing that cocoon immunization is a highly inefficient approach to protect newborns from severe pertussis complications, with significant programmatic issues associated with its implementation, BCCDC investigators contributed to re-focusing national efforts on more effective, alternative approaches to reduce newborn risk.	Patient: Protocols and guidelines System: Efficiency, cost/benefits or sustainability System: Knowledge dissemination-new policy

Women's Health Research Institute (WHRI)

Producing and Advancing Knowledge

In FY 2014-15, researchers affiliated with WHRI were awarded a total of $2,087,528 in research funding, which represents a 20% decrease over last year. The amount awarded as Operating Grants ($1,593,836) makes up 76.4% of total awards. A breakdown of funding types and subtypes can be found in Figure 49 and by funding source category in Figure 50. WHRI's portion of the Indirect Costs Program grant totaled $106,326.94 for FY 2014-15 but is not included in total research funding or the figures below. WHRI shares investigators with a number of other health research institutes and universities and benefits from additional external grant revenues linked to these investigators. At this time, those research dollars are only included if a formal transfer agreement is in place to allocate attribution of shared investigator grants. As a result, total research funding below is understated.

Figure 49

Total WHRI Research Funding by Funding Type and Sub-type by Fiscal Year

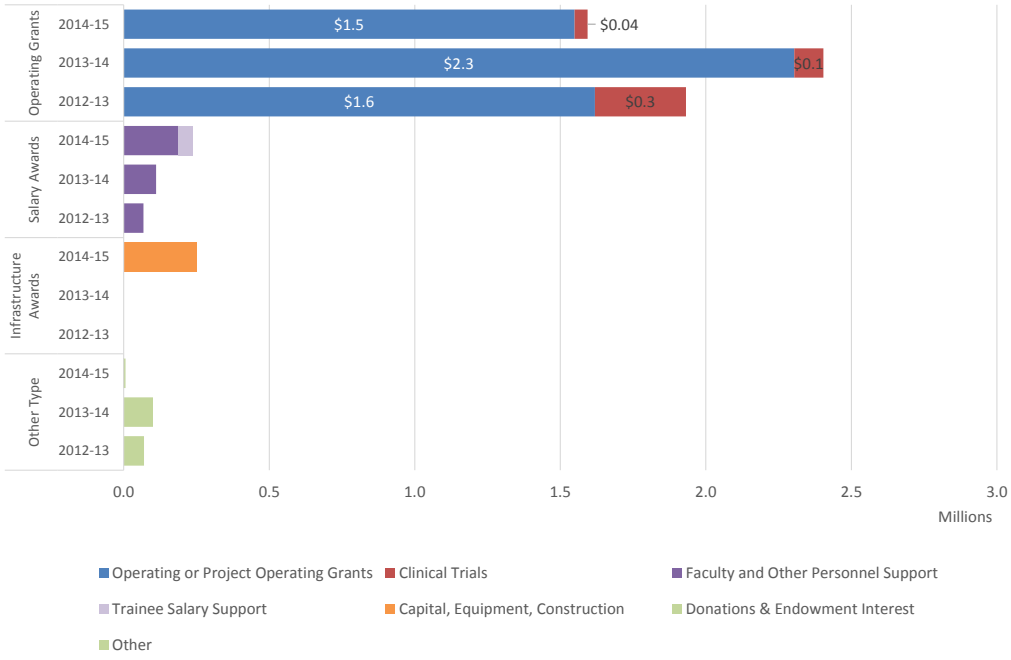
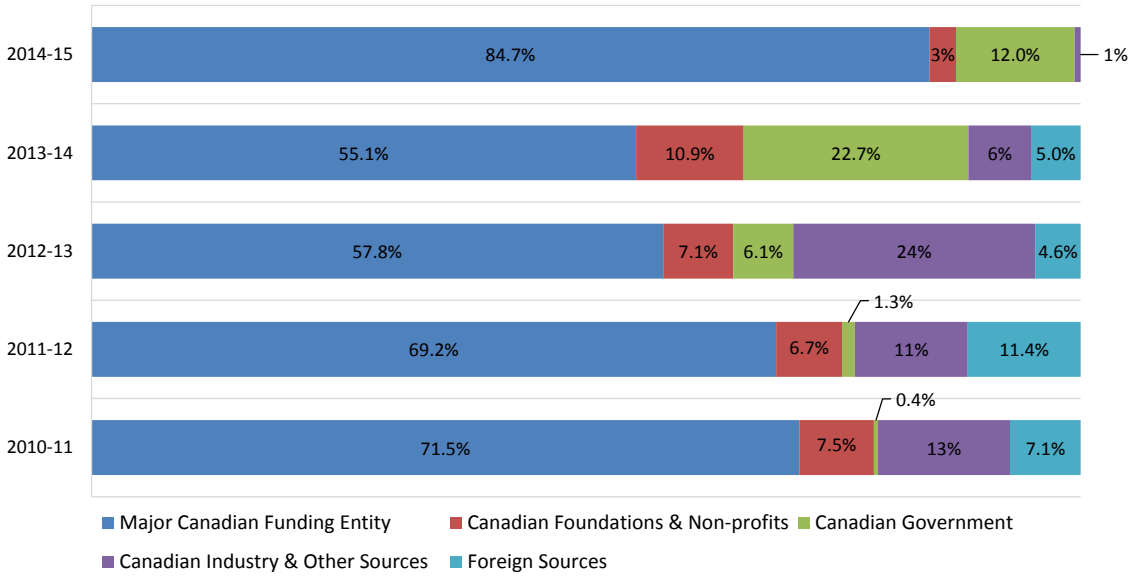


Figure 50

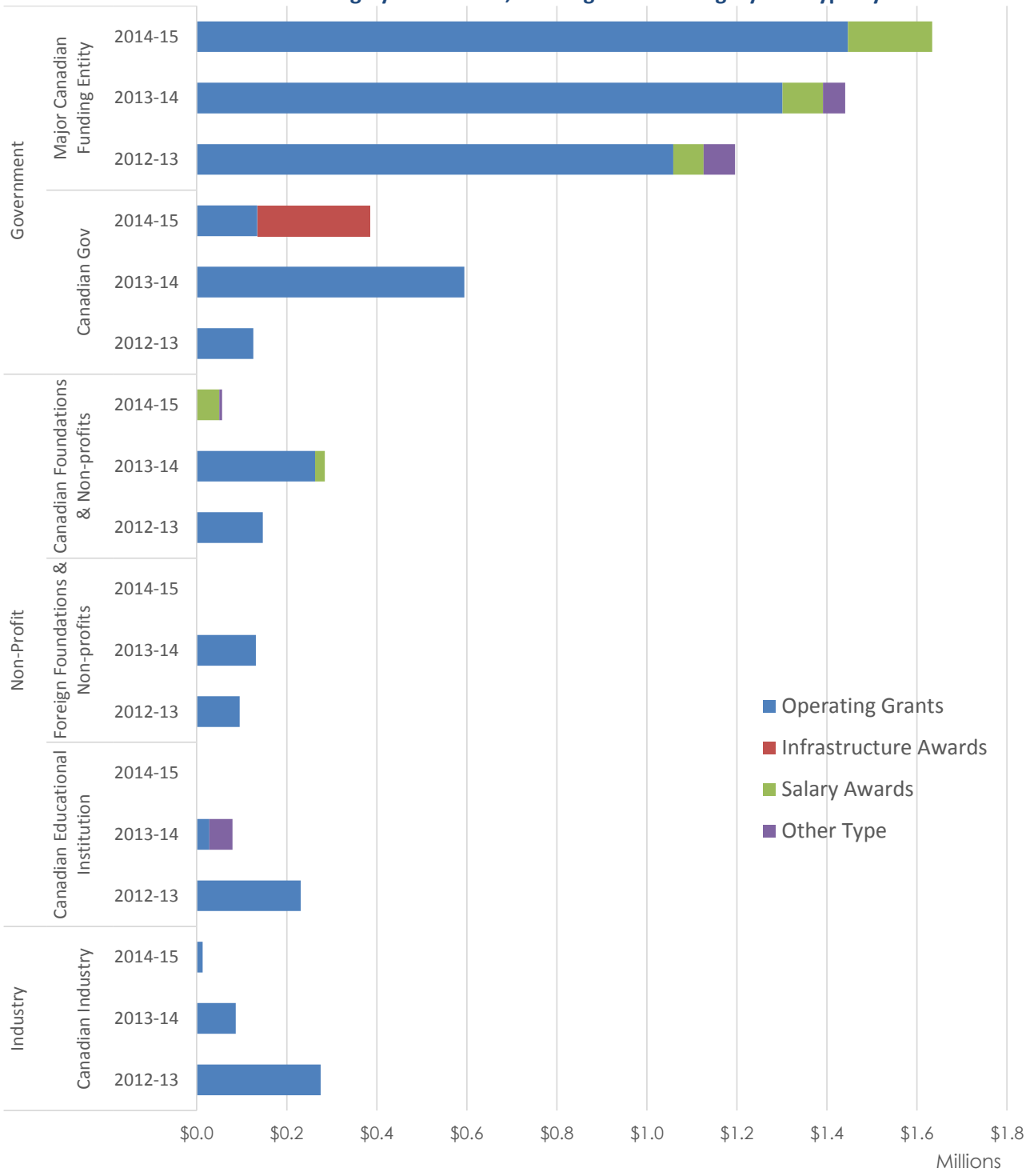
Percentage of WHRI Research Funding by Funding Source Category by FY



In FY 2014-15, the top two funding categories are Major Canadian Funding Entity (84.7%) and Canadian Government (12.0%). Of note is the reduction in the Canadian Industry and Foreign Sources categories which have made up as much at 30% of funding in previous years. Figure 51 details the major funding categories by funding type.

Figure 51

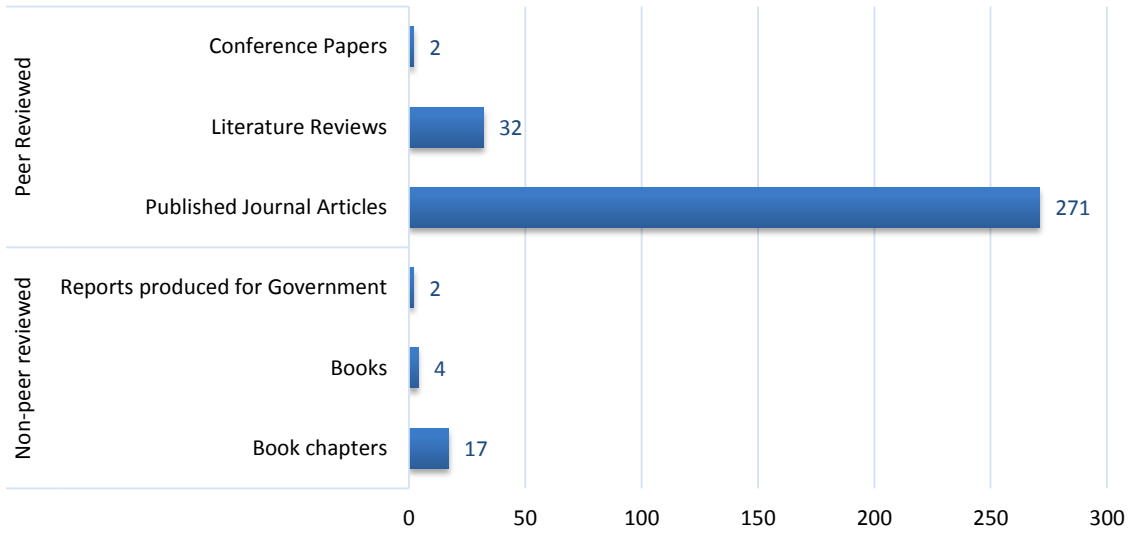
Total WHRI Research Funding by RISe Sector, Funding Source Category and Type by Fiscal Year



WHRI had two applications submitted in the March 2014 CIHR operating grant competitions and one approved. This is not graphically represented due to small sample size. Members of the WHRI apply for grant competitions that are offered by a variety of granting agencies.

WHRI had a total of 328 publications in FY 2014-15 of which 93% were peer reviewed. Total number of publications by type and category (peer vs. non-peer reviewed) is shown in Figure 52. Peer review represents the gold standard for scientific credibility. The agency total represents the number of publications where at least one agency researcher was an author of the publication. When researchers from more than one research entity/agency collaborate on the same publication, it is counted once for each agency.

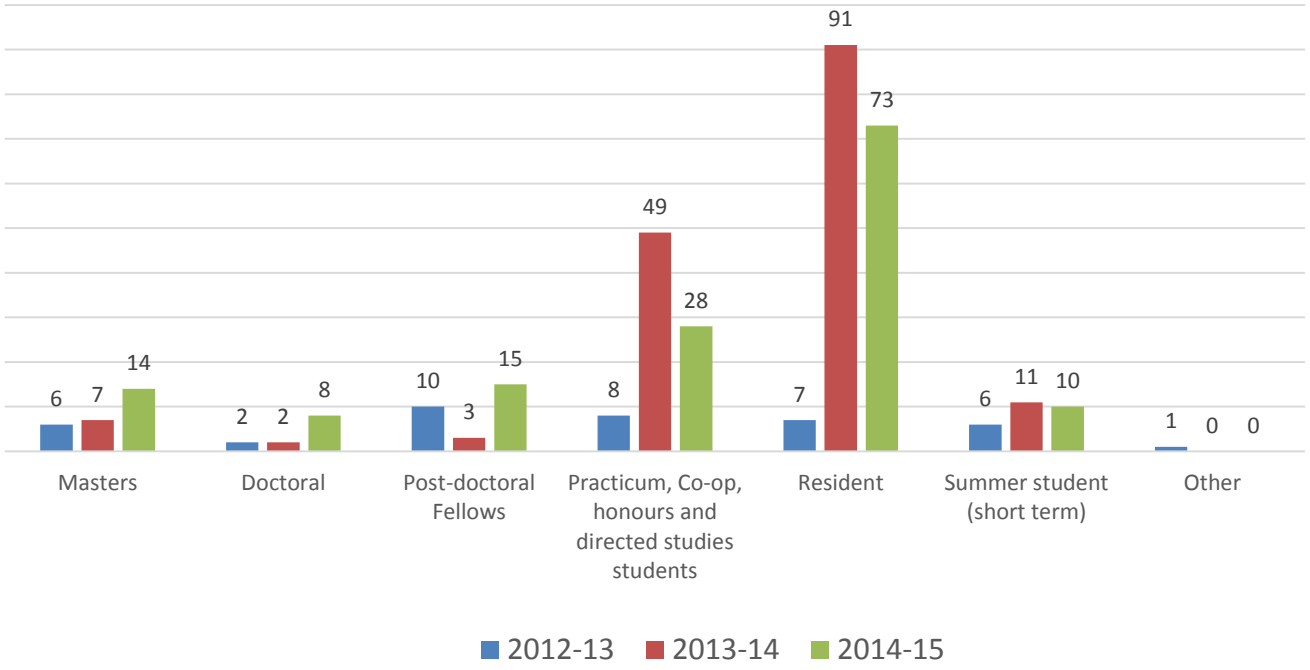
Figure 52
Total Number of WHRI Publications by Type and Category



Building Research Capacity

WHRI researchers provided training and supervision to a total of 148 trainees, down 15 from FY 2013-14 (see Figure 53).

Figure 53
Total Number of WHRI Trainees by Type



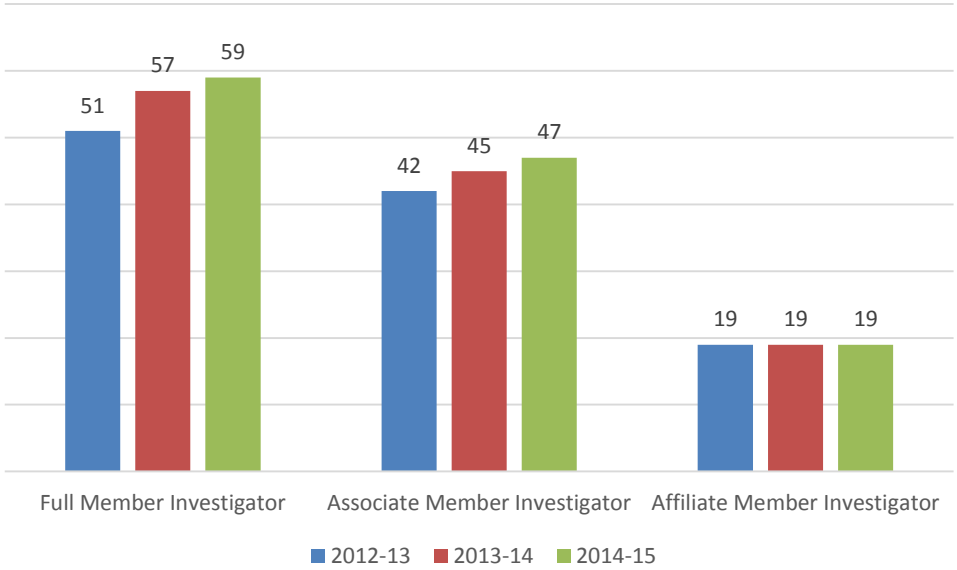
In an effort to show WHRI's activities, their membership statistics are shown (see Figure 54). In FY 2014-15, the number of full members and associate members each increased by 2. The membership categories are as follows:

Full Member Individuals involved in women's health research for which the WHRI would be the only research institute affiliation.

Associate Member Individuals who are involved in women's health research, at least in part, but have a strong relationship with another research institute (e.g. CFRI) that they wish to maintain; the result is a dual membership with the WHRI and their current affiliation.

Affiliate Member Individuals who are extensively involved with another institute, but may have projects that would overlap with WHRI.

Figure 54
Total WHRI Membership by Category



Advancing Health and Policy Benefits

Clinical trial data is provided for a second year utilizing the same methodology as last year. See Table 13 for a detailed breakdown of clinical trial activity by fiscal year. Of note is that approximately 33% (34% in FY 13-14) of WHRI trials had no enrollment figures. Once these fields are made mandatory as opposed to optional, enrollment figures should increase.

Table 13
WHRI Clinical Trials

	11-12	12-13	13-14	14-15
Total Number of Clinical Trials active during the FY	30	26	26	27
Status of the Trial at the end of the FY:				
Total Number of Active Trials	30	26	26	20
Total Number of Trials that closed during the FY	13	7	6	7
Enrolment Numbers:				
Expected Local Subject Enrolment (for the term of the study)	4,479	3,694	3,709	3,433
Total Cumulative Subject enrolment at the end of the FY	1,885	2,223	1,811	1,940

Table 14 reflects a sample of key guidelines, drugs, diagnostic agents, or devices adopted or approved in FY 2014-15 as a result of research driven by WHRI researchers, and their corresponding benefits. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 14
WHRI Outcomes

Guideline, drug, diagnostic agent, or device adopted or approved in 2014 – 15 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified	Benefit Type
WHRI researcher was the principal author of the national clinical practice guideline: *Venous Thromboembolism and Antithrombotic Therapy in Pregnancy*	Improved maternal and fetal outcomes due to accurate diagnosis, management and prevention of Venous Thromboembolism during pregnancy and the postpartum period. Increased patient safety by recommending diagnostic strategies that minimize maternal and fetal radiation exposure.	Patient: Protocols and guidelines
WHRI researcher was one of the principal authors of national clinical practice guideline: *The Management of Uterine Fibroids in Women With Otherwise Unexplained Infertility*.	The new guideline will result in improved management of women with fibroids and infertility, maximizing their chances of pregnancy by minimizing risks introduced by unnecessary surgery. Cost savings and increased patient safety by reducing complications and eliminating unnecessary interventions.	Patient: protocols and guidelines System: Efficiency, cost/benefits or sustainability
WHRI researcher participated in the Hypertension Guideline Committee that led to the development of the national clinical practice guideline: *Diagnosis, Evaluation, and Management of the Hypertensive Disorders of Pregnancy: Executive Summary*.	Improved maternal, perinatal and paediatric outcomes due to evidence-based approaches to the diagnosis, evaluation and treatment of the hypertensive disorders of pregnancy within the Canadian context.	Patient: Protocols and guidelines
WHRI researcher led a study examining the educational, practice and personal experiences of planned home birth among Canadian maternity care providers. The findings of this study have led to the development of an American best practice guideline: *Transfer from Planned Home Birth to the Hospital.*	The guidelines developed based on the study findings will lead to improved quality of care for women and families across birth settings through the promotion of respectful inter-professional collaboration, ongoing communication and the provision of compassionate family-centered care.	System: Process of care – protocol implementation
WHRI researcher was the principal author of a national guidance document: *Society for Obstetricians and Gynaecologists of Canada Committee Opinion on the Management of a Pregnant Woman Exposed to or Infected With Ebola Virus Disease in Canada.*	This guidance document was developed in response to an outbreak of Ebola virus disease in West Africa and outlines recommendations on the management of a pregnant woman exposed to or infected with Ebola. Improved public safety due to reduced disease transmission in the event of a local outbreak.	Patient: protocols and guidelines
WHRI researcher participated in the Reproductive Endocrinology Infertility Committee that led to the development of the national clinical practice guideline: *The prevention of Ovarian Hyperstimulation*	Improved outcomes for women undergoing assisted reproductive treatments by assisting in the prevention of ovarian hyperstimulation syndrome, early recognition of the condition when it occurs, and provision of appropriate supportive measures	Patient: protocols and guidelines

Guideline, drug, diagnostic agent, or device adopted or approved in 2014 – 15 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified	Benefit Type
Syndrome.	in the correct setting.	
WHRI researcher was one of the principal authors of a national clinical practice guideline: *The Use of Magnetic Resonance Imaging in the Obstetric Patient*.	This guideline is intended to reassure patients and clinicians of the safety of MRI in pregnancy and to provide a framework for its use. Cost savings and increased patient safety due the encouragement of judicious use of obstetrical MRI.	Patient: protocols and guidelines System: Efficiency, cost/benefits or sustainability
WHRI researcher participated in an international consortium to provide Standard Operating Procedures for endometriosis research: *World Endometriosis Research Foundation Endometriosis Phenome and Biobanking Harmonisation Project.*	Improved world-wide collection of population health-level data on endometriosis through the standardized acquisition of surgical and nonsurgical data and biological samples, which will allow for large-scale collaborative research into the condition.	System: Knowledge dissemination – new policy
WHRI researcher was one of the principal authors of a national clinical practice guideline: *Prenatal Invasive Procedures in Women With Hepatitis B, Hepatitis C, and/or Human Immunodeficiency Virus Infections*.	This guideline will results in improved maternal and fetal safety due to use of non-invasive methods of prenatal risk assessment for women infected with hepatitis B, hepatitis C, and/or human immunodeficiency virus. Reduced risk of perinatal transmission of these infectious diseases at the time of delivery by avoiding the use of invasive prenatal procedures in pregnancy.	Patient: protocols and guidelines Patient: Delay of disease progression/survival
Dissemination of knowledge translation materials on the Optimal Birth website, were developed on the basis of research supported by CFRI/WHRI.	Improved patient outcomes due to facilitation of evidence-based care and informed choice around vaginal birth after Caesarian section, with downstream impact of decreasing rates of Caesarian section in the province of British Columbia.	System: Knowledge dissemination – new policy
WHRI researcher was a principal author of a national clinical practice guideline: *Vulvovaginitis: Screening for and Management of Trichomoniasis, Vulvovaginal Candidiasis, and Bacterial Vaginosis*.	Improved outcomes for women due to optimized screening for and management of vulvovaginal candidiasis, trichomoniasis, and bacterial vaginosis. Targeted use of antibiotic treatment will result in decreased costs to the health care system and will reduce associated harms to the patient.	Patient: protocols and guidelines System: Efficiency, cost/benefits or sustainability
WHRI researcher participated in the Genetics committee that led to the development of the national clinical practice guideline: *Prenatal Screening, Diagnosis, and Pregnancy Management of Fetal Neural Tube Defects*.	These guidelines will provide health care practitioners with a better understanding of the available prenatal screening methods for open and closed neural tube defects and the benefits and risks associated with each technique to allow for optimized screening, diagnosis and obstetrical management of cases of prenatally diagnosed neural tube defects.	Patient: protocols and guidelines
A WHRI researcher was one of the principal authors of national clinical practice	This national guideline will lead to improved outcomes for pregnant women living with HIV and	Patient: protocols and guidelines

Guideline, drug, diagnostic agent, or device adopted or approved in 2014 – 15 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified	Benefit Type
guidelines: *Guidelines for the Care of Pregnant Women Living With HIV and Interventions to Reduce Perinatal Transmission.*	HIV-exposed infants, including reduced risk of perinatal transmission of HIV from mother to child at the time of delivery and improved clinical follow-up of HIV-exposed infants. Cost savings due to the prevention of HIV infection in at-risk infants.	System: Efficiency, cost/benefits or sustainability
WHRI researcher participated in the clinical practice – gynaecology committee that drafted the practice update: *Technical Update on Tissue Morcellation During Gynaecologic Surgery: Its Uses, Complications, and Risks of Unsuspected Malignancy*.	Improved patient outcomes due to better counseling prior to minimally invasive surgery of the risk of tumour dissemination with the use of tissue morcellation in the case of unexpected uterine sarcoma or endometrial cancer. Increased patient safety due to more appropriate training and the establishment of safe practices for the use of this surgical technique.	Patient: protocols and guidelines
WHRI researcher was a principal author of a national clinical practice guideline: *The Management of Uterine Leiomyomas*.	This guideline will improve the decision-making process of women and their health care providers in proceeding with further investigation or therapy for uterine leiomyomas. Reduced costs to the health care system by balancing the cost of untreated disease conditions and the cost of repeat investigative or treatment modalities to situations of maximal benefit to patient outcomes.	Patient: protocols and guidelines System: Efficiency, cost/benefits or sustainability

Registries & Datasets

Advancing Health and Policy Benefits

For a second year, data was collected from PHSA's registries and data sets to capture information to allow identification of users of the databases, how the data support research and a benefit classification which provides a deeper understanding of the benefits resulting from the use of these data for research.

Data stewards for a total of 14 PHSA registries or datasets, were invited to participate in a survey designed to assess the research activities of the registry/dataset. Completed surveys from 12 out of the 14 registries/datasets were obtained. The Research Metrics working group drew a distinction between two types of databases that might be counted. The first are those that serve as registries. These are the result of significant infrastructure investment in the collection of longitudinal data that are regional, provincial or national in scope regarding provision of services to specific population(s), maintained for the purposes of undertaking analysis, surveillance and/or research. They represent a significant resource for and investment in research. The second (not collected) are short-term, project-related databases that are primarily grant funded and are not maintained for use beyond the term of a given research project.

Registry/data set Definition/Purpose

The information on each registry/dataset was compiled from online resources and is described below.

Registry/Dataset	Purpose
BC Cancer Registry	The BC Cancer Registry is a population-based registry of all cancers diagnosed in British Columbia residents. It collects data and generates cancer statistics on the BC Population for the purpose of monitoring the burden of cancer in the province. It also serves as a source of information for research.
BC Cardiac Registry (HEARTis)	Heart Information System (HEARTis) tracks a patient journey for all current and future cardiac procedures, throughout British Columbia, from registry on the waitlist to procedure completion and follow up. Its purpose is to support clinical care, quality assurance and improvement, and outcome-based research.
BC Perinatal Database Registry (BCPDR)	The (BCPDR) contains data abstracted from obstetrical and neonatal medical records on nearly 100% of births in the province of British Columbia from over 60 hospitals as well as births occurring at home attended by BC registered midwives. The BCPDR also collects data on maternal postpartum readmissions up to 42 days post-delivery and baby transfers and readmissions up to 28 days after birth. Data access is provided for public-interest research purposes, surveillance, program delivery, and evaluation.
BC Trauma Registry	Provides data collection, reporting and support of research and quality initiatives related to trauma care.
Central Transfusion Registry (CTR)	The (CTR) is a population based database operated by the BC Provincial Blood Coordinating Office (PBCO) and contains records of recipients who have received blood and blood products in British Columbia and the Yukon. The PBCO and its provincial stakeholders use the CTR to support transfusion medicine utilization, quality and safety initiatives.
Cervical Cancer Screening Database	A population based clinical system for cervical cancer screening as well as a lab system for all gynaecological cytology performed by the Provincial lab.
PREDICT	PREDICT - Personal Response Determinants in Cancer Therapy is a unique centre-wide research project that has embedded a research culture into the day to day clinical care activities of the BC Cancer Agency's Vancouver Island Centre (VIC). The goals of PREDICT are to: 1) create a population-scale biobank of blood samples obtained prior to initiation of systemic therapy from 20,000 new cancer patients; 2) obtain permission from all new patients to be contacted to participate in future research projects, overcoming ethical and logistical hurdles to translational health research; and 3) engage 75% of new patients and staff at the VIC in a common research endeavor that changes the culture of a cancer centre. PREDICT provides a unique platform to support specific research into host factors, such as the patient's immune system and adverse reactions to therapy, that influence the outcome of cancer therapies.
PICNET	Provincial Infection Control Network of BC's aim is to to reduce healthcare-associated infections in BC healthcare facilities. Key areas of focus are surveillance, evidence-based guidelines, and education.
PROMIS-BC Renal Agency/Transplant	Patient Records and Outcome Management Information System – is the renal care community's clinical information system. With data collected from the 39 renal units in British Columbia, PROMIS supports: Individual patient care management; Renal unit management; Continuous quality improvement and research; Outcomes-based planning. PROMIS database is

Registry/Dataset	Purpose
	used as a source of important epidemiological data in support of clinical trials and for assessing new therapies.
Screening Mammography Database (SMP)	Clinical system for scheduling, reporting and tracking of screening mammography exams.
Surgical Patient Registry (SPR)	SPR is a provincial program involving the five regional Health Authorities, the Provincial Health Services Authority (PHSA) and the Ministry of Health (MoH). SPR tracks patients waiting for surgery in British Columbia and provides information to evaluate and monitor surgical wait times in the province.
Tumour Tissue Repository (TTR)	TTR is a provincial resource to support translational cancer research at the BCCA, across Canada and internationally. The TTR is a state of the art tumour bank that collects tissues, blood, and clinical information and processes these to create anonymous cases that can be studied by cancer researchers to understand how cancer develops, how it grows, how it spreads, and how it responds to treatment.

Supporting Research Activities

For FY 2014-15, Twelve (12) out of the fourteen (14), or 86% of registries/datasets are used for the purpose of research as defined by UBC (see Glossary, page 83). In addition, respondents were asked to identify other activities they provide in support of research. Table 15 lists the support activities by registry/dataset and shows the number of times in the past two fiscal years that a registry has provided a particular support activity. These research support activities are ranked from most provided to least over the two year period.

Table 15
Research Activities Supported by Registries and Datasets

Research Support Activity	Cancer	Cardiac	Cervical	Perinatal	PICNet	PREDICT	Renal	SMP	SPR	Transfusion	Transplant	Trauma	TTR	Grand Total
Support in managing and linking data	2	2	2			1	1	2	2	2	2	2	2	20
Support in designing research studies	2	2	1	2		2	1	2	1	1	1	1	2	18
Assist in identifying knowledge gaps and improvement needs	1	2	2	2	1		1	2	1	2	2	2		18
Facilitate communication to identify pertinent research question		2	2	2	1		1	2	2	1	2	2		17
Support in ensuring studies meet regulatory standards	1	1	2	2		1	1	2	2	1		1	2	16
Support in conducting biostatistical analysis	1	2	1				1	2	2		1	2		12
Provide specialized and multidisciplinary methodological expertise	1	1				1	1		1		1		2	8
Teaching and hands on training for the above						1	1			1			2	5
Application of new technical capabilities to provide more timely access to wider range of data		2					1		1			1		5
Support in providing and teaching project management skills							1			1				2
Other	1					1								2
Not used to support research					1									1
Grand Total	**9**	**14**	**10**	**8**	**3**	**7**	**10**	**12**	**12**	**9**	**9**	**11**	**10**	**124**

Respondents were asked for a second time this year if they submit data to external organizations for the purposes of research. See Table 16 for the breakdown of data set type by registry/dataset for FY 2014-15. Table 16 lists the type of external data set and shows the number of times in the past two years that the registry has submitted data. The type of dataset is ranked from most submitted to least.

Table 16
Provision of Data to external Data Sets by Registry

Type of External Data Set	Cancer	Cardiac	Cervical	Perinatal	PICNet	PREDICT	Renal	SMP	SPR	Transfusion	Transplant	Trauma	TTR	Grand Total
Pan Canadian dataset	2							2	1		2	2	2	11
Cross feeding within PHSA	1	1					1		1		1	1		6
International dataset	2						1				2			5
Provincial data		1					1		1	1				4
Other	2			2		1						1		6
Data Not Submitted to Any Organization		1	2		2	1				1				7
Grand Total	**7**	**3**	**2**	**2**	**2**	**2**	**3**	**2**	**3**	**2**	**5**	**4**	**2**	**39**

Names of the external datasets include:

Provincial:
Surgical Patient Registry (SPR) Completed Surgical Cases
Population Data BC
Statistics Canada

Pan Canadian:
Canadian Cancer Registry
Canadian Organ Replacement Registry (CORR)
Public Health Agency of Canada (Canadian Breast Cancer Screening Database)
National Trauma Registry
Pediatric Trauma Care Quality Indicators – London Health Sciences
Canadian Joint Replacement Registry - CIHI
Canadian Tumor Repository Network (CTRNet)

International:
North American Association of Central Cancer Registries (NAACCR)
International Agency for Research on Cancer (IARC – a division of the World Health Organization)
International Society for Heart & Lung Transplant (ISHLT)

In addition to Registries listed above, BC Emergency Health Services (BCEHS) submits data to an international registry, the Resuscitation Outcomes Consortium (ROC) which is a clinical trial network focusing on research in the area of pre-hospital cardiopulmonary arrest and severe traumatic injury. The results are 4 distinct data sets; Cardiac Clinical Trials, Trauma Clinical Trials, Cardiac Arrest Registry and Trauma Registry. There were no requests or approvals to access these data sets in FY 2014-15.

Nature of Research Activities

CIHR (Canadian Institutes of Health Research) categorizes health research into four broad themes: biomedical research, clinical research, health services research (research respecting health systems and services); and social, cultural, environmental and population health. Research pursued using the registries/datasets above are categorized in Figure 55. Access requests are summarized in Figure 56. For examples of the types of research questions posed by researchers, please see Appendix 1.

Figure 55

Ranking of Predominant Nature of Research Questions Using Data from the Registries/Datasets

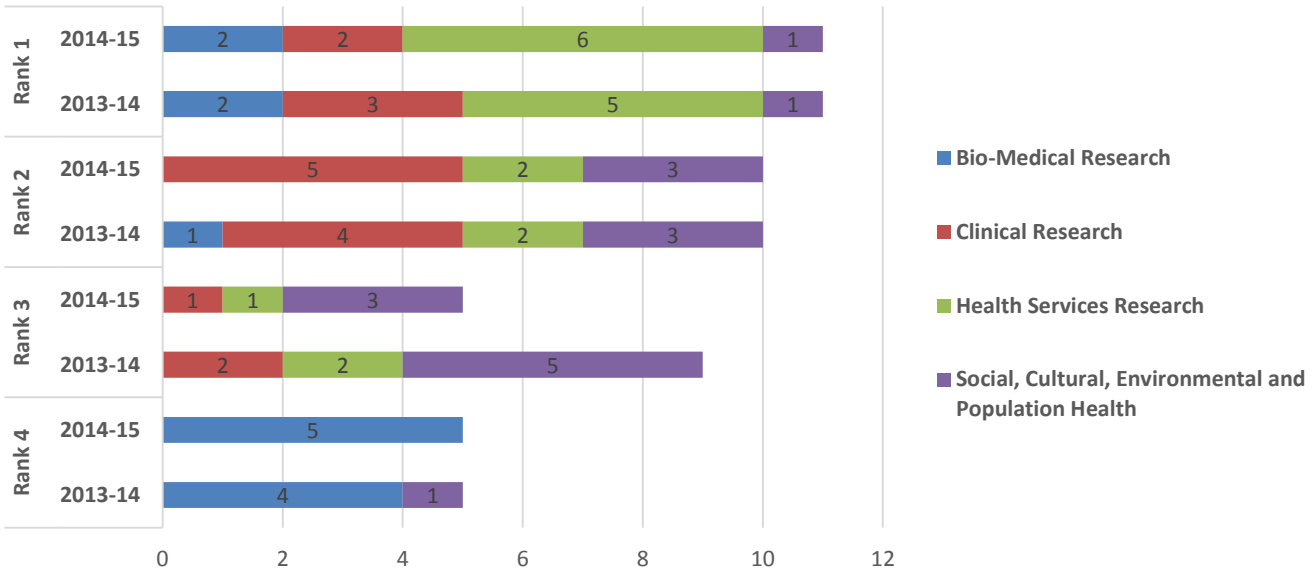
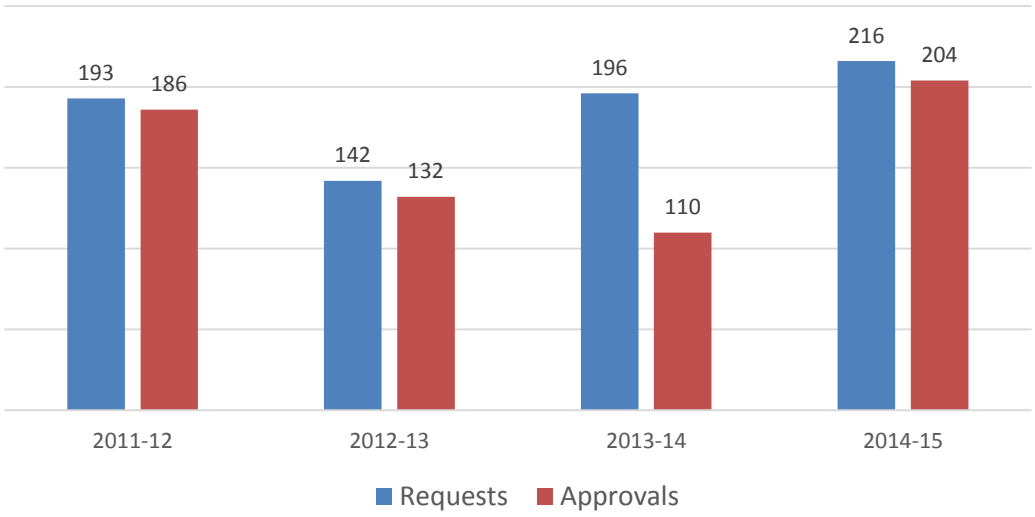


Figure 56

Research Access Requests and Approvals from Registry/Dataset by Fiscal Year



In addition, BCEHS manages two distinct data sets for ongoing research; King Airway and the Red Blood Cell Products Pilot Project. BC Emergency Health Services is mainly a health service delivery agency whose mandate includes the production of knowledge in the patient populations they serve.

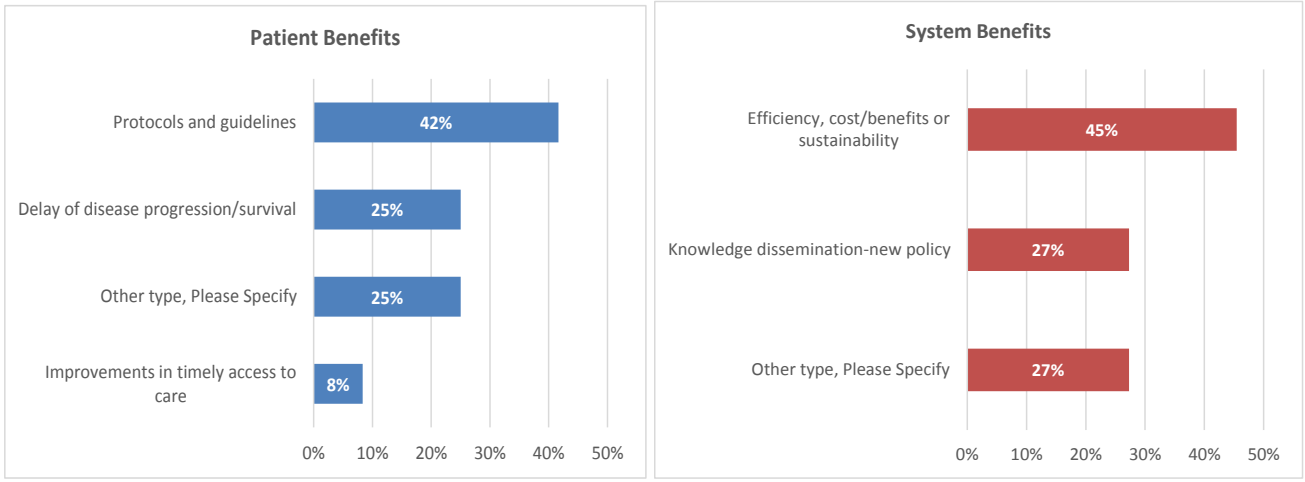
Research Benefits

Again this year, data stewards were asked to classify the research benefits identified for FY 2014-15 into two distinct categories; Patient Benefits and System Benefits. See below for further detail on benefit types. Benefits resulting from research activities are close to being evenly split with 52% attributed towards System Benefits and 48% towards Patient Benefits.

Benefit Type	Benefit Sub-type
Patient Benefit:	Delay of disease progression/survival.
	Access to new treatment/technology
	Protocols and guidelines
	Improvements in timely access to care
	Other
System Benefits:	Process of care – standardization
	Process of care – protocol implementation
	Efficiency-cost/benefits or sustainability
	Knowledge dissemination – new policy
	Resource improvements – workforce
	Other

Figure 58 shows the percentages for each benefit category as a result of the registry and dataset usage for FY 2014-15.

Figure 58
Percentage of Benefit Sub-type by Type for FY 2014-15



A sample of patient and/or system benefits that were quantified, identified, or attained in FY 2014-15 that resulted from research based on the registry or dataset is excerpted below.

Table 17
Registry/dataset Patient and System Benefits

BC Cancer Registry	• We received a note that a paper written from a linked-health study was included in a body of evidence in Australia to draft a new guideline on the use of hypofractionated radiotherapy for tumours of the breast. The BC paper using the BC Cancer Registry data (and other linked BC data) showed that the use of hypofrac RT did not increase cardiac mortality or morbidity compared to conventional RT	Patient: Protocols and guidelines
	• a paper generated on BCCA/Registry data in collaboration with Ontario generated some of the first quality estimates of cancer costs and has led to a pan-Canadian expansion of the work and workshops with leaders in provinces about costs	System: Knowledge dissemination-new policy
	• an entire monograph in the prestigious Journal of the National Cancer Institute was devoted to studies that have worked to identify risk factors for Non-Hodgkin Lymphoma and various subtypes of these malignancies. A number of studies within that monograph were written using BC Cancer Registry data and were co-authored by agency team members	System: Other type, Please Specify
	• a paper that came out this year using Registry data presented results for the cost-effectiveness of PSA screening for prostate cancer to inform whether provincial promotion of this screening modality would be of benefit to British Columbia	System: Efficiency, cost/benefits or sustainability
	• similar publication linked Cancer Registry and Screening databases to assess the cost-effectiveness of annual mammography to provide evidence as to whether there was cost-benefit to guide program decisions	System: Efficiency, cost/benefits or sustainability
BC Perinatal Database Registry	• as a result of data used to analyze stillbirths in BC one group published a paper calling for change in the definition of stillbirth, to standardize reportable fetal deaths thereby improve clinical care and public health	System: Other type, Please Specify
	• study of prescription drug use in postpartum shed light on appropriate and safe use of certain postpartum medications to reduce the negative effects on newborns through breastfeeding or breastmilk	Patient: Other type, Please Specify
	• using data from the PDR to validate data quality through a provincial re-abstraction study	System: Other type, Please Specify
BC Trauma Registry	• The primary objective is to use the 'ACT Model' to evaluate the "timing" (when treatment is provided) and the "setting" (where patients are treated) of SCI care and how they relate to patient outcomes and health care costs.	Patient: Improvements in timely access to care
	• The Spatial Epidemiology of Traumatic Head Injury in British Columbia Search criteria: AIS >= 3 for head body region or GCS <= 8 with head injury	Patient: Delay of disease progression/survival
	• evaluation of CT protocol for cervical spine injuries	Patient: Protocols and guidelines
	• research on HIV patients who have trauma	System: Knowledge dissemination-new policy

	• To understand the impact of not giving warm saline to hypothermic trauma patients at the scene	Patient: Delay of disease progression/survival
Cervical Cancer Screening Database	• increase screening start age from 21 to 25 to reduce potential harms of screening	Patient: Protocols and guidelines
PREDICT	• The PREDICT program has provided direct opportunity to patients (>1400 patients) to contribute to and partner with our research program	Patient: Other type, Please Specify
	• reduces research costs of enrolling patients into clinical studies	System: Efficiency, cost/benefits or sustainability
PROMIS - Transplant Registry	• modify immuno-suppressive therapy treatment	Patient: Delay of disease progression/survival
Screening Mammography Database	• creation of decision-aid to help women in BC make informed decision about screening mammography	Patient: Protocols and guidelines
Surgical Patient Registry	• awareness of blood usage; less blood ordered by physicians	Patient: Protocols and guidelines
	• awareness of vendor volumes for hip and knee; improves purchasing power leading to cost savings; plus awareness of malfunctioning of prosthetic hip and knee devices, leading to improved decision and ordering.	System: Efficiency, cost/benefits or sustainability
Tumour Tissue Repository	• The TTR has provided direct opportunity to patients (>250 patients) to contribute to and partner with our research program	Patient: Other type, Please Specify
	• The TTR supports the Canadian Tissue Repository Network by the promotion of the Biobank Resource Centre's tools including a User Fee Calculator, a tool to inform biobank sustainability	System: Efficiency, cost/benefits or sustainability
	• The TTR leads the Canadian Tissue Repository Network's national certification program for biobanks that disseminates knowledge of best practice standards	System: Knowledge dissemination-new policy

Appendix 1 - Example Research Questions by Registry/Dataset

BC Cancer Registry	• A provincial database review of long term health outcomes of HIV uninfected children born to HIV infected mothers, and cellular aging and HIV comorbidities in women and children • A randomized controlled trial of an online support group for sexual distress due to gynecologic cancer • An investigation of cervical cancer in women age 25 years or less in British Columbia • An investigation of pediatric melanoma in British Columbia • Exploring the impact of regionalization activities on patients undergoing high-risk, resource-intensive cancer surgery in Canada • Long-term health resource utilization and total economic burden following diagnosis of systemic autoimmune rheumatic diseases: a population-based study • Personalized treatment of lymphoid cancer: British Columbia as model province • Risk factors for breast cancer subtypes • TNM staging and prognostic factors for neuroendocrine tumours of the small bowel, colon, appendix and rectum • Trends in systemic therapy use and cost in BC and Saskatchewan
BC Cardiac Registry	• Assessment of temporal changes in patient characteristics treated with percutaneous coronary intervention • Distal embolic protection device use and its association with procedural safety and long-term outcomes following saphenous vein graft intervention: an analysis from the British Columbia Cardiac Registry • Influence of Peri-operative Stroke on Early and Late Mortality Following Open Heart Surgery • Outcome comparison of assessment strategies of patients with ischemic chest pain in the emergency department. • Revascularization patterns and outcomes in diabetic patients with coronary artery disease
BC Perinatal Database Registry	• A retrospective cohort study of maternal and newborn outcomes and maternity care provider mix in rural BC • BC RSV Immunoprophylaxis with Palivisumab for risk selected babies: Quality Assurance of the BC RSV Program Guidelines • Evaluation of pregnancy outcomes using pgd vs clinical management of pts experiencing recurrent pregnancy loss due to a parental carrier of a structural chromosome abnormality • Examining cesarean section delivery patterns using the Robson Classification system • Mechanism of aging following exposure to HIV antiretroviral drugs CHIR team in HIV therapy and aging. Carma-4 part b: a provincial database review of long term health outcomes of HIV uninfected children born to HIV infected mothers and cellular aging and HIV comorbidities in women and children
BC Transfusion Registry	• To assess the trends in revascularisation for patients with acute coronary syndromes (ACS) and whether these procedures are associated with higher bleeding rates resulting in procedural related transfusion. • What is the risk of a serious complication after renal biopsy in patients with GN in BC, and does this vary by geographic region, era, and race or income level?
BC Trauma Registry	• Evaluation of CT protocol for cervical spine injuries • Research on HIV patients who have trauma • The primary objective is to use the 'ACT Model' to evaluate the "timing" (when treatment is provided) and the "setting" (where patients are treated) of SCI care and how they relate to patient outcomes and health care costs. The ACT project is a collaborate

	• The Spatial Epidemiology of Traumatic Head Injury in British Columbia Search criteria: AIS >= 3 for head body region or GCS <= 8 with head injury
Cervical Cancer Screening Database	• Gynecological cytology and histology history of patients with differentiated vulvar intraepithelial neoplasia • Incidence of cervical carcinoma and CIN3 in BC women under 25 years old • Post LEEP clinical outcomes in CCSP patients
PREDICT	• How does the performance of qPCR-based assays compare to immunohistochemisty and fluorescence in situ hybridization in the detection of anaplastic lymphoma kinase fusion in formalin-fixed embedded tissue of lung cancer patients? • What is the feasibility for the use of non-invasive sampling in the diagnosis and disease monitoring of ALK positive lung cancer patients by analysis of plasma and serum.
PROMIS - Transplant Registry	• rate of delayed graft function first two weeks post-operative • three year graft failure rate in kidney population due to rejection
Screening Mammography Database	• association of mammographic density with breast cancer subtypes and other known risk factors • description of pre-diagnosis care for breast cancer patients in BC • screening utilization amongst adult childhood cancer survivors
Surgical Patient Registry	• Identify the type and amount of blood product used by clinical specialty and surgeon. • Identify the volume and type of hip and knee prosthesis used provincially.
Tumour Tissue Repository	• Can the development of a pan-Canadian discovery and validation platform to identify biomarkers in the stratification of ovarian cancer patients improve clinical management? • Do germline variations associated with the phenotype of breast cancer, explain the inter-individual differences and a person's genetic predisposition to the disease? • Do tumour associated macrophages secrete oncostatin-M in the breast tumor microenvironment and result in the suppression of estrogen receptors? • Is there a difference in the pattern of gene deregulation in non-smokers who develop cancer compared to smokers who develop cancer? • What are the similarities and differences in gene expression changes that drive hepatocyte differentiation and hepatocellular carcinoma?

Appendix 2 - Framework for PHSA Research Metrics

1. **Indicator: Producing and Advancing Knowledge**
   This category includes measures reflecting discoveries/new knowledge, and contributions to scientific literature.

   a. Total annual grant awards by agency/research entity and PHSA
   b. Total annual external grant awards by agency/research entity, identified by major funding categories (e.g., tri-council, provincial, Genome Canada/BC, international, private sector, etc.)
   c. Annual grant application success rate by agency/research entity and PHSA
   d. Total # Publications
   e. Citations

2. **Indicator: Building Research Capacity**
   This category includes measures reflecting enhancements to both human resource and infrastructure capacity.

   a. Total # trainees by agency/research entity
   b. Scholarships/fellowships by agency/research entity
   c. Total # researchers by agency/research entity
   d. Infrastructure investments
      i. E.g. – hospital research fund, CFRI, capital projects etc.
      ii. Databases (patient, tissue) etc.
   e. Indirect Costs Program

3. **Indicator: Achieving Economic Benefits and Innovation**
   This category includes measures reflecting commercialization of discoveries, revenues and other economic benefits resulting from discoveries, and general impacts on the BC economy.

   a. # Intellectual property disclosures, patents by agency/research entity
   b. Licenses, royalty income, spin-off companies
   c. New research hires to agency/research entity - job creation?
   d. Policy initiatives

4. **Indicator: Advancing Health and Policy Benefits**
   This category includes measures reflecting individual and population health impacts of research in prevention, diagnosis and treatment.

   a. Clinical trials (translational research)/patient outcome data
   b. New clinical guidelines/patient outcome data
   c. New drugs funded/patient outcome data
   d. Policy initiatives/patient outcome data

Appendix 3 - Research Metrics Working Group Membership*

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UBC/C&W Coordinator Pre & Post Awards

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Director, Research Administration & Performance Improvement
BC Mental Health & Substance Use Services

Karen Hagan
Grants Advisor, Office of Research Facilitation, BC Cancer Agency

Nathalie Pilkington
Coordinator, Faculty & Institutional Initiatives, Child & Family Research Institute

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Priscilla Vuong
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*As of September, 2014

Glossary

Term	Description
Metric Definitions	
Metrics 1ab, 2b – Total annual grant awards, Total annual external grant awards by major funding categories and Scholarships/fellowships all by agency or research entity	Total Annual Award ($) for Grants, Awards and Contracts by Funding Source
Metric 1c – Annual grant application success rate by agency/research entity. Added in FY 09-10	Success rates for two CIHR operating grant competitions (March and September of applicable year) for BCCA and CFRI, BCMHSUS and WHRI.
Metric 1d – Total # of Publications Added in FY 10-11; Category addition in FY 11-12	Total number (of publications, not authors) published within applicable fiscal year meeting the following criteria: Book, book chapter, reports produced for the government, peer-reviewed publication inclusive of published journal articles, case reports, essays, literature reviews, e-journals and monographs. Excluded = abstracts, editorials, summaries, letters to the Editor, epubs, in press and submitted publications.
Metric 2a – Total number of trainees by agency/research entity	Total Number (head count, not FTE) of Research Trainees by Student Type. (Exclude clinical trainees who are supported during their brief research rotations.) Research trainees counted will be any individuals who are primarily supervised by a researcher affiliated with the reporting unit, during all or a portion of the reporting year.
Metric 2c – Total number of researchers by agency/research entity	List of Researcher Names including Research definition (This metric is to be collected based on CFRI methodology category types wherever possible, if not available in that format, please designate your category as "5" and add your research definition in the space provided.) Added in FY 11-12 is a column to collect whether a researcher is a shared resource or 100% attributable to a specific agency.
Metric 2d - Infrastructure Investments - Major CFI Infrastructure Grants (Added FY 10-11)	Total FY $ for Leading Edge Fund (LEF)/New Initiatives Fund (NIF) awards from Canada Foundation for Innovation. LEF projects sustain and further enhance the most advanced research and technology development efforts already supported by past CFI investments. LEF projects build on existing areas of research priority where institutions have a competitive advantage and a proven track record in enhancing Canada's science and technology capacity. NIF projects build Canada's capacity in new, promising areas of research and technology development. Also included in these amounts are the matching funds (industry, educational, charity, etc.) to these awards. Excluded from these amounts are $'s associated with the Infrastructure Operating Fund (IOF) or Leaders Opportunity Fund (LOF) from CFI. These get reported under Infrastructure – HR awards and operating grant categories respectively.
Metric 2e – Indirect Costs Program grants (Added FY 12-13)	A federally funded grant to Canadian post-secondary institutions to help pay the indirect costs of research (e.g. salaries for research administrative staff, administrative costs associated with patent activities, maintenance of lab space). These annual grants are based on a formula related to tri-council award amounts (CIHR, NSERC, and SSHRC) and are paid to the research institutes based on a formal revenue sharing agreement. Due to how UBC is now reporting revenue precipitated by policy changes of the CAUBO (Canadian Association of University Business Officers), PHSA includes revenue related to the Indirect Costs Program (ICP).

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Term	Description
Metric 3a - # of intellectual property disclosures, patents by agency/research entity	Total number of Invention Disclosure (internal documents), provisional patent and PCT applications by fiscal year.
Metric 3b – Licenses, royalty income and # spin-off companies (Revised FY 10/11)(Revised Net Licensing Rev definitions in FY 2013-14)	Total number of active license/assignment agreements and spin-off companies. List the names of all active spin-off companies. These numbers represent cumulative totals from year to year and are no longer reported by region. IP related revenue shall follow the UILO (University-Industry Liaison Office) definitions from FY 2010-11 forward. **Definitions:** **Gross licensing revenue** = Royalties + Equity Liquidated + Option Fees + License Fees + License Management + Technology Assignment; Royalties - royalty payments including minimum annual royalty payments License Fees – upfront payments, milestone payments and other payments associated with the license License Management - legal fees incurred by TDO (Technology Development Office) or UILO relating to the licensed IP and reimbursed by licensees **Total TDO Expenses for patenting and legal costs -** ? **Expenses for Licensed IP** – patenting, legal and related costs associated with licensed IP **Realized revenue per distribution agreements** – revenue accrued to PHSA agency after distribution to inventors, obligations due to affiliated academic institutions, granting agencies and inventor departments. The revenue distribution varies by entity and will be noted in the narrative. **<u>Royalty, equity liquidated and licensee fees</u>** When the UILO licenses technology to a company, the terms of the license typically includes a requirement to pay a % royalty on product sales, an upfront license fee and an annual license maintenance fee. The UILO may also negotiate an equity component (company stock) as part of the license agreement. Under the licensing scenario, the University still owns the technology but is granting a license to a third party. **<u>Option Fees</u>** This relates to the scenario when a company desires an option on a technology (essentially reserving/holding the technology). These are usually short-term contracts that have a modest option fee. **<u>Technology Assignment</u>** This relates to the scenario when a company wishes to take ownership of the technology and in return pays an Assignment fee.
Funding Type Categories (columns)	
Funding Types/Grant Types	The columns on worksheet 1ab, 2b that correspond to the funding types agreed to by the Research Metrics Working Group on July 22, 2009 and revised at the working group's direction in subsequent fiscal years.

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Term	Description
Salary Awards	
Faculty and other personnel support	Dollar amount for FY for supported faculty salary awards including chairs.
Trainee salary support	Dollar amount for FY for supported trainee salary awards including trainee research allowances.
Infrastructure Awards	
Human Resources	Dollar amount for FY for Human Resource Infrastructure including Michael Smith Foundation for Health Research (MSFHR) - team start-up, team, research units, platforms, networks and institutional infrastructure, CFI Infrastructure Operating Fund (IOF) awards.
Capital, Equipment, Construction	Dollar amount for FY for capital, equipment, or construction awards including BC Knowledge Development Fund (BCKDF), matched sources (charities, industry) and other large equipment grants. Excluded are Canada Foundation for Innovation (CFI) awards (see next category).
Capital, Equipment, Construction - Major CFI (Added in FY 10-11)	Dollar amount for FY for capital, equipment, or construction Major Canada Foundation for Innovation (CFI) awards for Leading Edge Fund (LEF)/New Initiatives Fund (NIF) awards. Also included in these amounts are the matching funds (industry, educational, charity, etc.) to these awards. Excluded are $'s associated with the Infrastructure Operating Fund (IOF) or Leaders Opportunity Fund (LOF) from DFI. These get reported under Infrastructure - HR and Operating Grant categories respectively. (see Metric definition 2d for further detail)
Operating Grants	
Operating or Project Operating Grants (not exclusive of the next three columns)	Dollar amount for FY for operating or project operating grants including when the salary component is embedded in a grant; includes establishment grants; includes development grants.
Clinical Trials (4a) (Definition clarified in FY 10-11)	Dollar amount for FY for any research project that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes. Health related interventions include any intervention used to modify a biomedical or health-related outcome, for example drugs, surgical procedures, devices, behavioral treatments, dietary interventions, and process-of-care changes. Health outcomes include any biomedical or health related measures obtained in patients or participants, including pharmacokinetic measures and adverse events.
Clinical Trials (4a) (Definition clarified in FY 10-11)	Dollar amount for FY for research involving a new laboratory technique or process, e.g. a new more cost effective processing for a genetic diagnostic test, or a new tissue preparation process, etc. Trials that may use clinical material but do not directly involve patients in the research or involve a risk to the patients (may involve their tissue or blood samples however).
Grant in Aid	Dollar amount for FY for Grant-in-aid awards (Broad topic but not directed). A Grant-in-Aid is essentially a donation to one or more researchers, normally to conduct research in an area that is of mutual interest to both the donor and the researcher(s). These grants are normally in the form of a one page letter addressed to a researcher and signed by the donor, and accompanied by the grant funds. Characteristics: • Sponsor supports research activities of an individual researcher or group of

Glossary

Term	Description
	researchers. Sponsor does not restrict use of funds • Funds are paid in advance • No invoicing or financial statements are required by Sponsor • University/Host Institution retains all rights to inventions and other intellectual property • University/Host Institution is free to publish results • University/Host Institution provides the Sponsor with a final report only • Parties to the Agreement: University/Host Institution and Sponsor (may include University/Host Institution Affiliated Hospitals)
Other Funding Type – Service Contracts Added as sub-type of Other Funding Type category in FY2010-11	Characteristics: (1) Solely for testing, evaluation or analysis of materials or compounds owned by the Sponsor with no intellectual input or value-added by UBC. (2) Sponsor retains all rights to intellectual property provided by the Sponsor for the services
Other Funding Type – Donations & Endowment Interest Added as sub-type of Other Funding Type category in FY2010-11	A donation is a gift given by an individual or an organization to a non-profit organization, charity or private foundation in support of a specific purpose. Endowment – gift of money or income producing property to a public organization (such as a hospital foundation or university) for a specific purpose (such as research or scholarships). Generally, the endowed asset is kept intact and only the income (known as endowment interest) generated by it is consumed.
Other Funding Type	Dollar amount for FY, combined, of any grant, award or contract that does not fit into the above categories. Please specify name of Funding Type in space provided.
Funding Source Categories (rows)	
UBC RISe Sector	Sector denotes an area of the **economy** in which the funder is assigned. This decision is based on how the organization is funded. Three sectors are currently utilized by UBC's Research Information System (RISe) and include: **Non-Profit** – funding provided mostly by private donations and endowments. **Industry** – funding provided by a for-profit business in the private or commercial sectors of business. **Government** – funding provided by local, provincial, national, federal or foreign government entity. [definitions to be further developed with input from Working Group and RISe personnel]
Funding Sources/Granting Agency	The rows on worksheet 1ab, 2b that correspond to the funding sources agreed to by the Research Metrics Working Group on July 22, 2009 and modified in subsequent fiscal years.

Glossary

Term	Description
CIHR and its institutes (included in Major Canadian Funding Category)	The Canadian Institutes of Health Research and its thirteen subsidiary institutes: * Aboriginal Peoples' Health * Aging * Cancer Research * Circulatory and Respiratory Health * Gender and Health * Genetics * Health Services and Policy Research * Human Development, Child and Youth Health * Infection and Immunity * Musculoskeletal Health and Arthritis * Neurosciences, Mental Health and Addiction * Nutrition, Metabolism and Diabetes * Population and Public Health
CCSRI (formerly NCIC/Canadian Cancer Society/CCSR) – (name changed to CCSRI for FY 11-12 and moved to CDN Foundation & Non-profit category)	On February 1 2009, the Canadian Cancer Society integrated the operations of the National Cancer Institute of Canada (NCIC), creating the Canadian Cancer Society Research Institute. Grants from all three of these organizations should go in this category.
NSERC (included in Major Canadian Funding Category)	Natural Sciences and Engineering Research Council
SSHRC (included in Major Canadian Funding Category)	Social Sciences and Humanities Research Council
Genome Canada and provincial Genome agencies (included in Major Canadian Funding Category)	Genome Canada, and its regional centres: Genome BC, Genome Alberta, Ontario Genomics Institute, Genome Quebec, Genome Prairie, and Genome Atlantic
MSFHR (included in Major Canadian Funding Category)	Michael Smith Foundation for Health Research (BC)
Canadian Industry	Canadian-based for-profit corporations. Decisions on whether a funding source is Canadian or Foreign are driven by award payment or contract address.
Canadian Foundations & Non-Profits (name modified in FY 12-13 to align with UBC categories – all historical data was recoded)	Canadian not for profit organizations including foundations and charities. These include grants that are “internally” sourced (i.e. that are from CFRI, BCCA or their affiliated Foundations such as BCWF, BCCHF, and BCCF etc.)
Canadian Educational Institution	This was added in FY 09-10 as a separate Funding Source Category and includes all educational and/or academic institutions in Canada. Foreign Educational Institutions are categorized under Foreign Other Source.
Canadian Government	Provincial, municipal, territorial or federal governments and crown corporations in Canada
Foreign Industry	For-profit corporations outside Canada. Decisions on whether a funding source is Canadian or Foreign are driven by award payment or contract address.

Glossary

Term	Description
Foreign Foundations & Non-Profits (name modified in FY 12-13 to align with UBC categories – all historical data was recoded)	Not for profit organizations including foundations and charities headquartered outside Canada, e.g. March of Dimes, American Cancer Society
Foreign Government	Provincial, municipal, territorial or federal governments and government controlled corporations outside Canada including the armed forces (e.g. US Military)
Foreign Other Source	All Foreign funding sources not captured in the above Foreign categories including Foreign Educational Institutions.
Research Trainees Categories (columns)	
Research Trainee	Total number of research trainees by student type excluding clinical trainees who are supported during their brief research rotations. Research trainees counted will be any individuals who are primarily supervised by a researcher affiliated with the reporting unit, during all or a portion of the reporting year.
Masters	Graduate students enrolled in a full time Master's program who are supervised by a faculty member affiliated with the reporting organization.
Doctoral (changed from PhD in FY 2010-11)	Graduate students enrolled in a full time PhD program who are supervised by a faculty member affiliated with the reporting organization.
Post-doctoral	Full time post-doctoral fellows whose primary focus is research (NOT clinical fellows)
Summer students (short term)	High school and or university students who are engaged in a short term program with the reporting agency for a limited period (e.g. over the summer, a few weeks)
Residents	MDs engaged in a residency program that may include a research rotation
Practicum, co-op, honors and directed studies students	High school and/or university students whose assignment to the reporting organization is according to a practicum, co-op, honours and/or directed studies program
Other Research Trainee Type	(Reporting organization to specify definition)
Research Trainees (rows)	
Do you Support These Types of Research Trainees	To be answered Yes or No for each Research Trainee Category listed above. Is used to indicate that a research entity does have Research Trainees of this type but has no data collection ability. This will distinguish between those with zero (0) Trainee types from those that have them but can't count them.
Total Head Count	Total number of research trainees of that type, not an FTE (Full Time Equivalent number).

Glossary

Term	Description
List of Researcher Name (columns and row)	
Category (modified to add Shared Membership sub-category under CFRI categories 1-3 in FY 2010-11)	A number one through five (MUST have one selected). Categories 1-4 are as described in the CFRI "Guide for Completing an Application for Membership" available online at http://www.cfri.ca/research_support/forms/membership.asp. These categories are based on a calculation of a given individual's research hours/week. Category 5 will be for those research entities/agencies who do not utilize the CFRI categories. If you utilize category 5, please indicate the definition that your research entity/agency uses to define Researchers. A shared membership sub-category available in CFRI Categories 1-3 was added in FY 2010-11. This new category allows individuals to formally declare their alignments (including percentage affiliation) with more than one organization. Category 4 was clarified to include only affiliate investigators that are not based on site but who collaborate with agency members. Their primary affiliation will be with another academic and/or research institution.
First, Last, Middle name	Self-explanatory, e.g. Jane Mary Smith
Short Name	Name as it would appear in PubMed, for example, Smith, JM
Count Attributed to Agency Added in FY 11-12	An indication by number (1 or .5) of whether a researcher is attributable to applicable agency 100% (full) or 50% (shared).
UBC's definition of Research Added in FY 13-14	UBC defines research involving human subjects as "any systematic investigation (including pilot studies, exploratory studies, and course based assignments) to establish facts, principles or generalizable knowledge which involves: living human subjects; or human remains, cadavers, tissues, biological fluids, embryos or foetuses." It does not include…"quality assurance studies, performance reviews or testing within normal educational requirements, or activities undertaken for administrative or operational reasons…" unless they include an 'element of research.'
OTHER	
Fiscal Year 08-09	April 1, 2008 – March 31, 2009
Fiscal Year 09-10	April 1, 2009 – March 31, 2010
Fiscal Year 10-11	April 1, 2010 – March 31, 2011
Fiscal Year 11-12	April 1, 2011 – March 31, 2012
Fiscal Year 12-13	April 1, 2012 – March 31, 2013
Fiscal Year 13-14	April 1, 2013 – March 31, 2014
Fiscal Year 14-15	April 1, 2014 – March 31, 2015