PHSA Research Metrics

5th Annual Report

Fiscal Year 2012-13

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PHSA Research Metrics Working Group
PHSA Performance Measurement & Reporting

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.

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PHSA Research Metrics Fiscal Year Summary – PHSA Overall

Indicator		Key Measure Description	FY 2010-11 Value	FY 2011-12 Value	FY 2012-13 Value
Producing & Advancing Knowledge	1a	**Total Annual Grant Awards by Type (excluding Major* CFI Infrastructure grants)**	**$127,823,436**	**$126,361,562**	**$126,703,056**
		Salary Awards	13,169,936	13,139,360	12,652,088
		Infrastructure Awards – HR & Minor CFI	8,353,900	7,611,165	4,689,873
		Operating Grants	99,851,648	98,270,202	100,064,997
		Other	6,447,951	7,340,835	9,296,098
		Total Annual Grant Awards including Major CFI Infrastructure grants (see 2d below)	**138,721,931**	**128,218,285**	**128,100,775**
	1b	**Total Annual Grant Awards by RISe Sector (excluding Major* CFI infrastructure grants)**			
		Government	68,330,997	71,158,285	64,617,326
		Non-Profit	44,051,454	43,495,243	50,226,591
		Industry	15,440,984	11,708,033	11,859,140
	1c	Annual Grant Application Success Rate – CIHR March Competition – PHSA Overall/Nat'l Rate	21.0%/18.2%	16.7%/20.1%	27.3%/20.1%
	1c	Annual Grant Application Success Rate – CIHR Sept Competition – PHSA Overall/Nat'l Rate	26.8%/21.4%	32.3%/22.1%	24.5%/20.8%
	1d	Total # of Publications with Agency Author			
		CFRI	563	620	631
		BCCA	353	352	429
		WHRI	154	196	324
		BCCDC	90	102	146
		BCMHARI	80	68	68
		BCEHS	4	0	0
Building Research Capacity	2a	Total # of Research Trainees	1,147	903	1,178
	2c	Total # of Researchers (excluding Category 4 – Affiliate Investigator Category)	607.5	641.5	653.5
		Category 4 – Affiliate Investigator	21.5	37	44.5
	2d	Infrastructure Investment – Major CFI Infrastructure Grants	$10,898,496	$1,856,724	$1,397,719
	2e	Indirect Costs Program Grants (Tri-Council only)	N/A	N/A	$3,445,518
Achieving Economic Benefits & Innovation (BCCA, CFRI & BCCDC only)	3a	# of Invention disclosures	46	45	55
		# of Provisional Patent applications filed	25	26	21
		# of PCT applications filed	7	6	8
		# of Patents Filed/Issued	45/6	16/5	43/4
	3b	# Active License Agreements	101	114	132
		# of Spin-off Companies	7	10	10
		IP related revenue – Realized Revenue			
		BCCA	$21,585.04	$70,334.84	$75,519.33
		CFRI	$32,556.99	$5,617.00	$71,896.00
Advancing Health & Policy Benefits	4a	**Clinical Trials**			
		# active trials as of FY close	372	393	474
		Total Subject Enrollment within FY	11,089	9,045	10,188
	4b,c,d	**Registries as Research Resources**			
		# of Research Requests/Approvals	159/82	193/186	142/132
		# of scholarly articles published	18	133	72

*see definition of Major Canada Foundation for Innovation (CFI) grants in Glossary – Appendix 4

Executive Summary

This is the fifth annual Research Metrics Report, based on the Framework for PHSA Research Metrics previously approved by the PHSA Research Committee (see Appendix 2, pg. 58). All previously reported qualitative and quantitative metrics have been updated to include data for FY 2012-13 in the Framework's four categories; **Producing & Advancing Knowledge**, **Building Research Capacity**, **Achieving Economic Benefits & Innovation**, and **Advancing Health & Policy Benefits**. This year, a new data element was captured, RISe sector (see glossary Appendix 4), and will be utilized to report funding source data going forward. This change was made to align with UBC's classification of research data and to streamline data collection efforts.

In addition, UBC is now reporting revenue related to the Indirect Costs Program (ICP), 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, SSHRC) and are paid to the research institutes based on a formal agreement. 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. The total amount of the ICP grant for FY 12-13 for all PHSA agencies combined was $3,445,518. 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.

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 & Addictions Research Institute (BCMHARI), 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, 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.

As seen on the PHSA Overall Summary Page, numbers of researchers, researcher trainees, and publications have all increased from FY 2011-12 levels. Total Annual Grant Awards ($126,703,056), without Major CFI (Canada Foundation for Innovation) grants, remained relatively stable with a small increase of $341,494. From FY 2008-09 until FY 2012-13, total annual grant awards have increased by 25% and total close to $650 million dollars. Major CFI Infrastructure grants are reported separately under research capacity, indicator 2d, and have shown a continued downward trend. These represent large-scale infrastructure grants that are not offered every year, and are multi-year in duration. Full grant amounts for Major CFI Infrastructure grants are recorded in the year budgets are established.

PHSA research entities continue to perform well in comparison with national peers. PHSA's success rates for both the March and September competitions have surpassed the national averages. Although the total number of CIHR applications for the March and September operating competitions decreased from 125 to 104, due to increased success rates, this resulted in only a small decrease in approved applications over last FY (27 vs. 31). 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.

Again this fiscal year, the total number of publications is reported by agency and shows an increase in most instances. Peer reviewed represents the gold standard for scientific credibility and again this year, over 95% of publications are peer reviewed. The total number 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 accurately available.

For a fourth 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.

For Indicator 4: Advancing Health and Policy Benefits, a survey was issued for a fourth year, asking respondents to identify any guideline, drug, diagnostic agent or device adopted or approved in FY 2012-13 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. While not intended to be an exhaustive listing, this years submissions highlight some of the key products resulting from PHSA research that are improving outcomes and system sustainability. For a fifth year, a sample of patient and system benefits that were quantified, identified or attained in FY 2012-13 that resulted from research based on a registry or data set is also provided. For datasets and registries, a decrease over FY 11-12 levels is seen for the # of research approvals from 186 to 132 and the number of requests from 193 to 142. This decrease is due to the lack of response from 3 of the 13 registries. The number of scholarly articles published as a result of research utilizing PHSA databases and registries is reported as 72. Work is underway to re-evaluate registry data collection to increase the validity of comparisons amongst registries and data sets.

In addition, Indicator 4, information related to clinical trial activity shows an increase in the number of active trials (from 393 to 474) while total subject enrollment increased from 9,045 to 10,188. This is an important indicator given participation in clinical trials provides patients with access to new treatments and therapies and represents the final step in translating research findings to standard of care treatment.

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) 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). 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

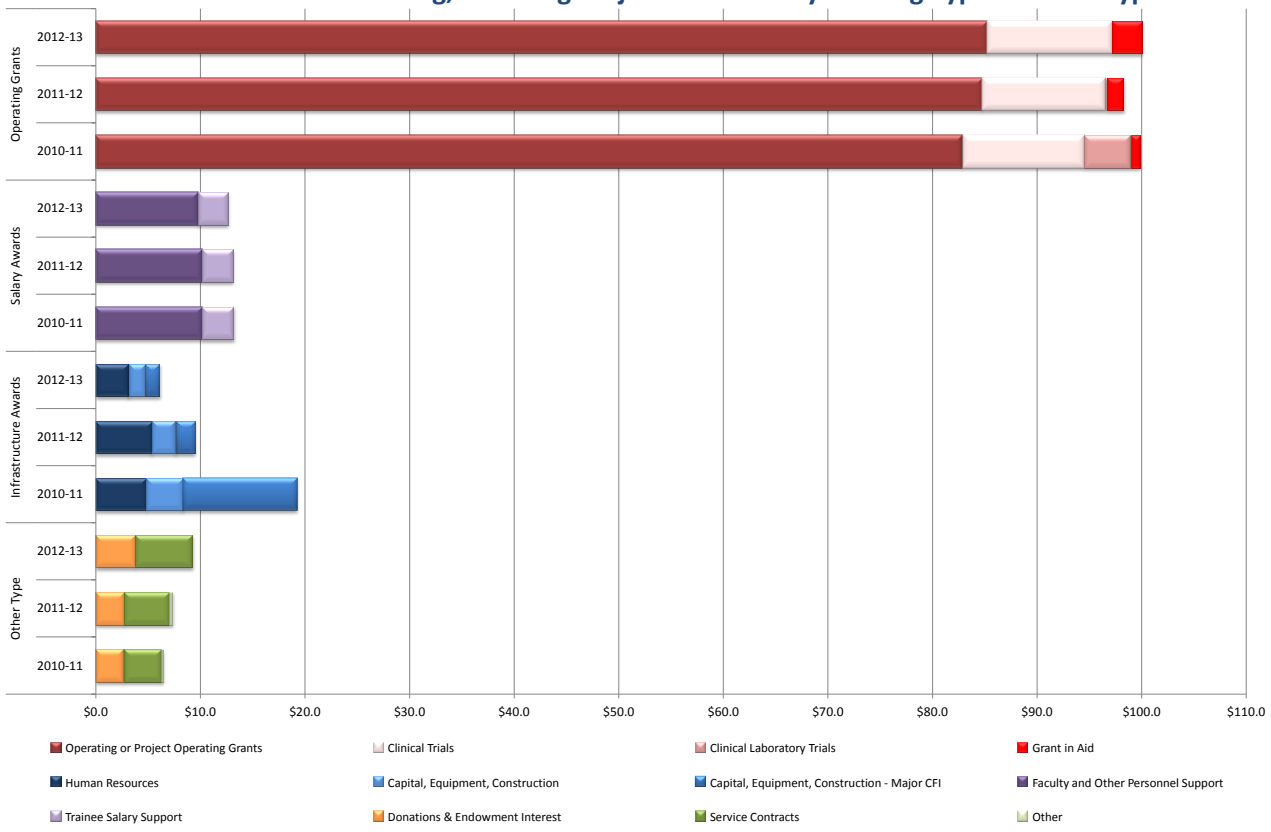
Producing and Advancing Knowledge

In FY 2012 -13, researchers affiliated with PHSA were awarded a total of $128,100,775 including major CFI infrastructure grants. Operating Grants ($100,064,997) continued to make up the largest portion (78%) of total funding received. This is a 2% increase in the portion of total awards over last year. 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. Again this year, the sub-types of Operating or Project Operating Grants, Human Resources [HR awards represent team start-up, team research units, platforms, networks & institutional infrastructure and CFI IOF awards] and Faculty and Other Personnel Support garnered the largest portion of research funding in their respective type categories. Clinical Trials funding, from FY 2010-11 – FY 2012-13 remained relatively stable.

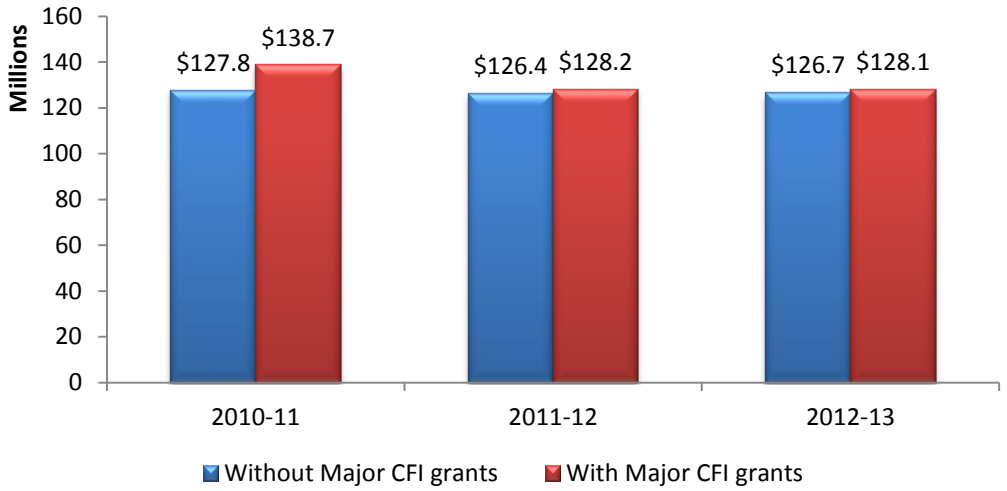
Figure 1

Total PHSA Research Funding, including Major CFI Grants by Funding Type and Sub-Type



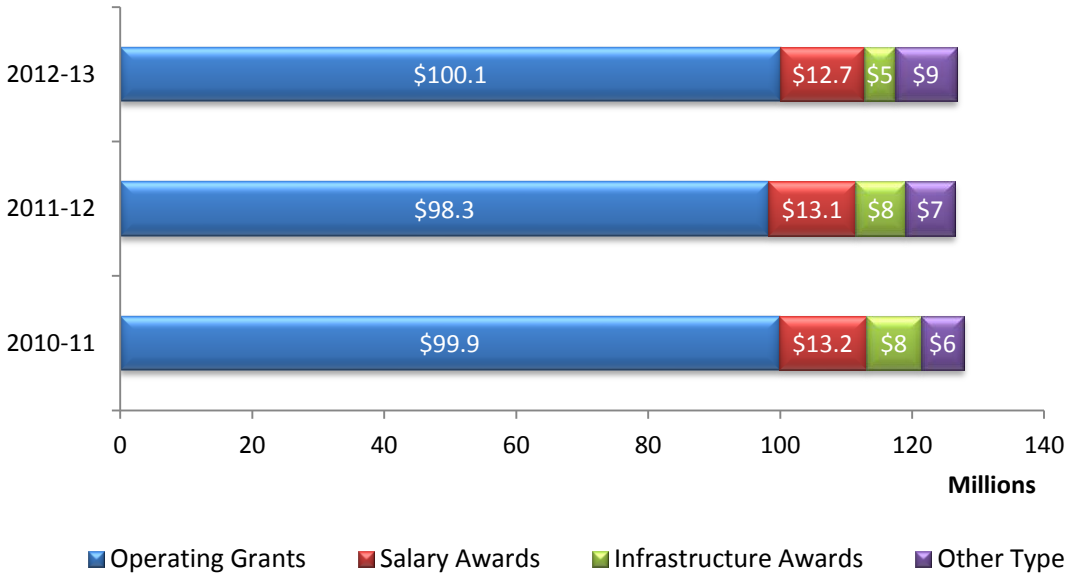
Total Funding, excluding major CFI infrastructure grants ($126,703,056), increased by $341,494. Total infrastructure grants totaled $1,397,719, which is due to the fact that large-scale CFI infrastructure grants are not offered every year, are multi-year in duration, and full grant amounts are recorded in the year budgets are established. Indirect Costs Program grants total $3,445,518 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. Total PHSA Research Funding showing Major CFI award impact, year over year, is provided in Figure 2.

Figure 2
Total PHSA Research Funding With/Without Major CFI Grants



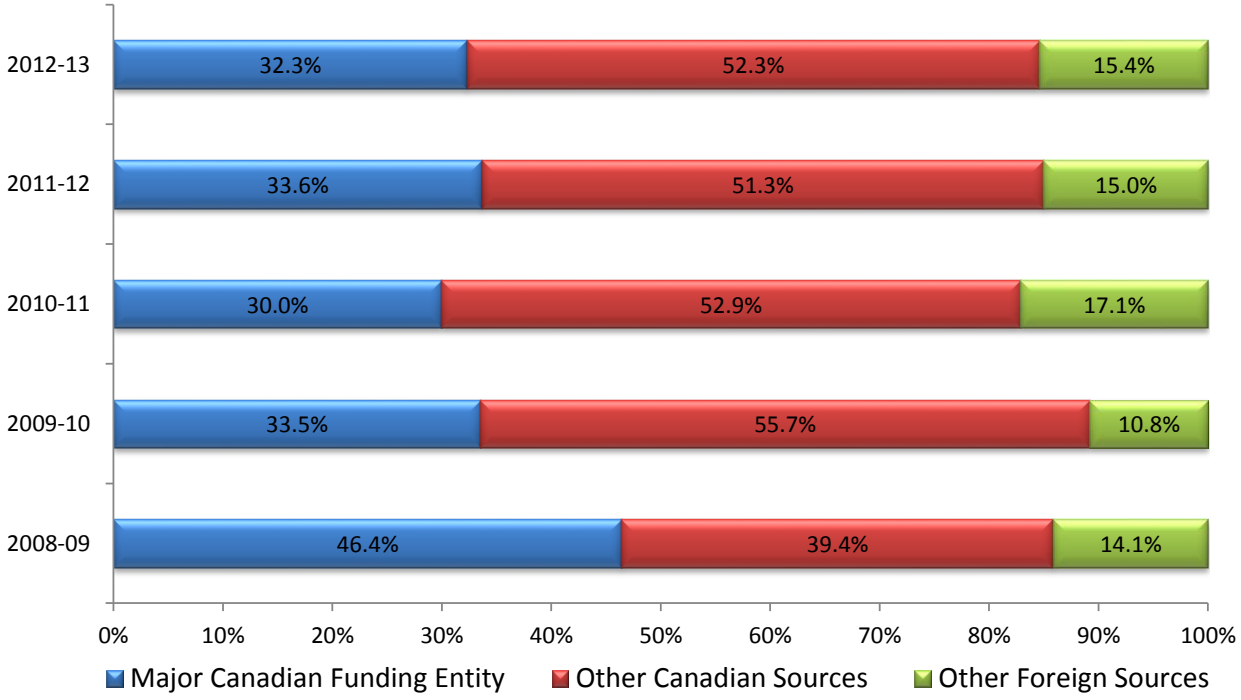
Additionally, Total Research Funding, without Major CFI grants, by Fiscal Year and Type is shown in Figure 3. This shows a relatively stable blend of Funding Types over the three-year period, noting that infrastructure awards have decreased, as they are not offered every year. The other type category includes donations and endowment interest and service contracts, which have seen an increasing, trend since FY 2010-11.

Figure 3
Total PHSA Research Funding without Major CFI Grants by Fiscal Year and Type



A comparison of funding source by source category over five (5) fiscal years can be found in Figure 4. This figure, generated by compiling hundreds of potential sources into three main categories, highlights the extent to which primary sources of funding vary from year to year and across research entities. These data include Major CFI grants. Funding sources have remained relatively stable over the last three fiscal years. Major Canadian Funding entities include CIHR, NSERC, SSHRC, and Genome Canada & Agencies. Funding source categories are detailed in Appendix 5.

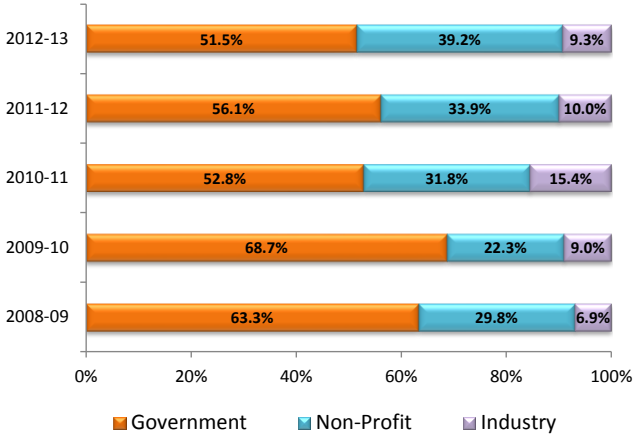
Figure 4
Percentage of PHSA Research Funding, including Major CFI grants by Funding Source Category by FY



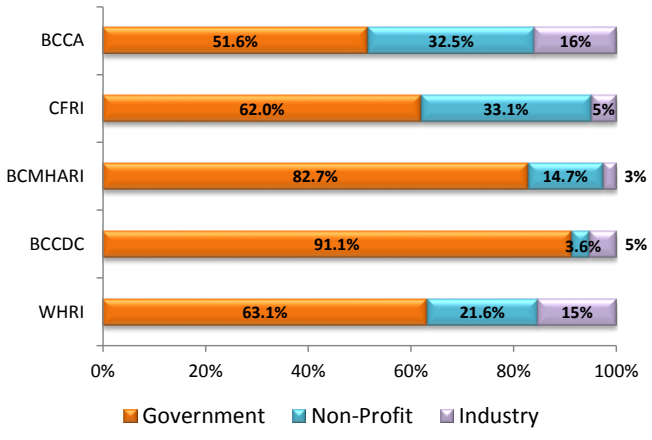
In addition to the above, Figure 5 shows the same award data by RISe sector (see glossary, pg. 63, for sector definition) both by fiscal year and by agency for five fiscal years. Of note on the FY chart, is the increase in the non-profit sector and the corresponding decrease in industry funding for PHSA agencies. Industry funding is 5% or less of the total for CFRI, BCMHARI and BCCDC while the government sector is crucial for the majority of research funding for all agencies.

Figure 5
Percentage of PHSA Research Funding, including Major CFI grants by RISe Sector

By Fiscal Year

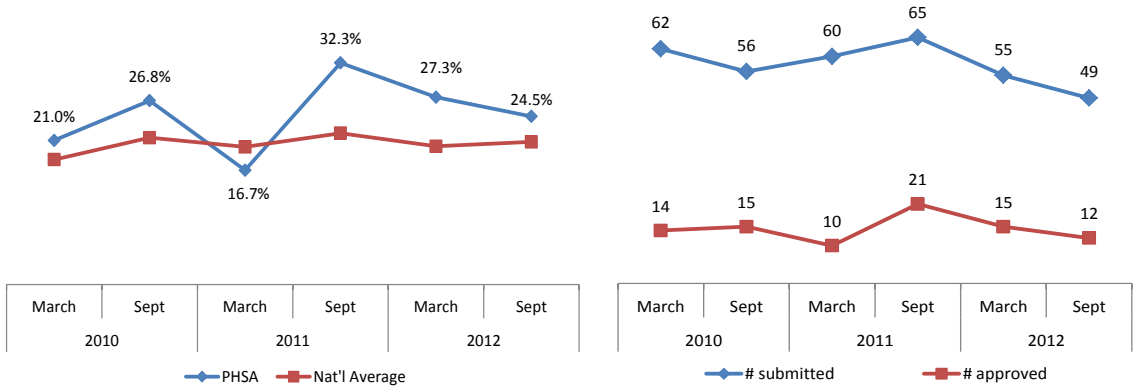


By Agency



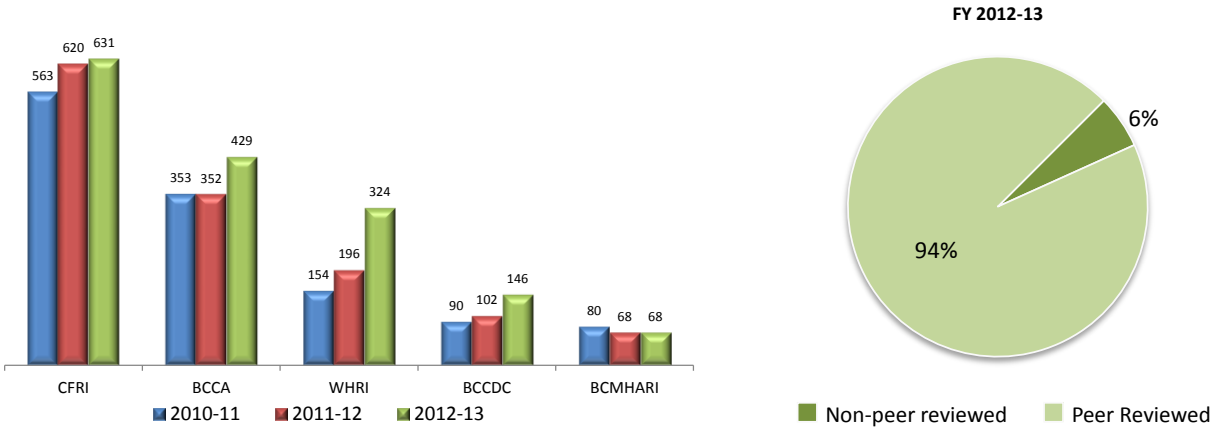
Again this year, PHSA researchers have achieved positive success rates in the two most recent CIHR operating grant competitions (March and September of 2012). PHSA researchers' success rates were better than the national average for both the March and September 2012 competitions. Figure 6 below shows the overall success rates based on revised competition results for the last three fiscal 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 the 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



Total # of publications is presented for the last three fiscal years. Publications were collected by research entities for the applicable fiscal year and meet the following criteria: Books, book chapters, peer-reviewed publications inclusive of published journal articles, case reports, essays, literature reviews, e-journals, monographs and reports produced for government. See Figure 7 for a breakdown of total publications by agency and category of peer-reviewed vs. non-peer reviewed. Peer review represents the gold standard for scientific credibility. 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 Percentage Peer vs. Non-peer Reviewed

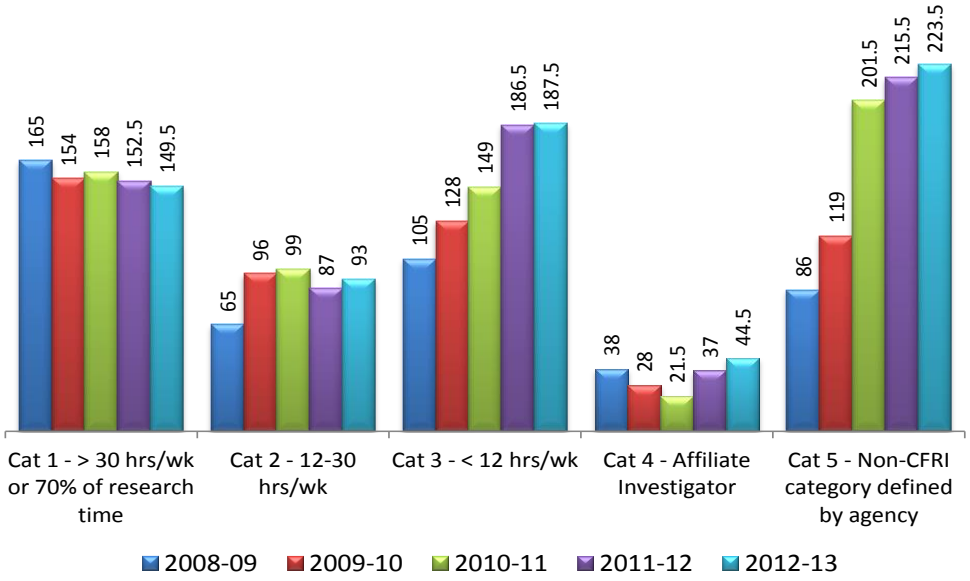


Building Research Capacity

PHSA research entities identified 653.5 researchers in categories 1 – 3 and 5 in FY 2012-13, up 12 from FY 2011-12 (see Figure 8). 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 44.5, up 7.5 from FY 2011-12. PHSA does not track category 4 members funding, publications or trainees. BCCA, BCMHARI 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



During FY 2012-13, PHSA researchers provided training and supervision to a total of 1,178 research trainees, an increase of 275 from FY 2011-12. 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

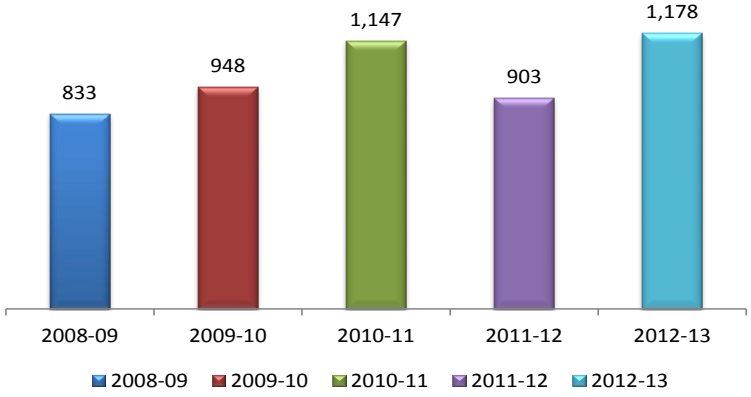
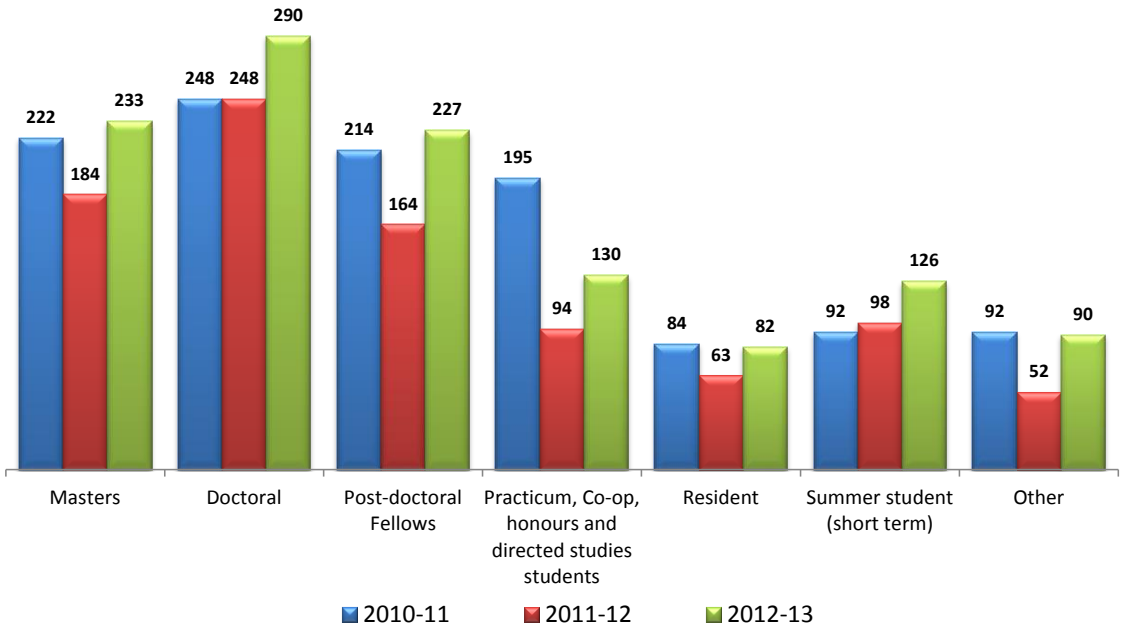


Figure 10
Total Number of PHSA Trainees by Type by Fiscal Year

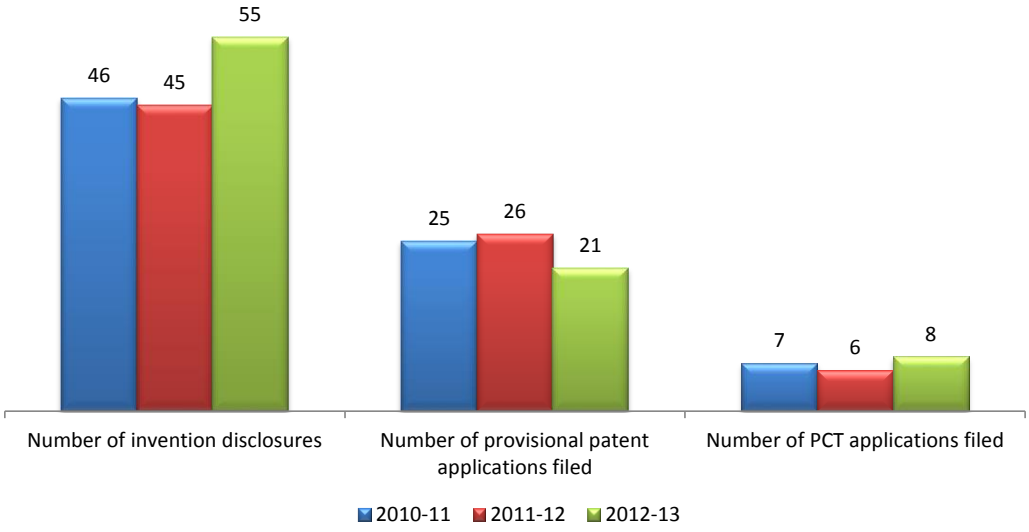


Achieving Economic Benefits and Innovation

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.

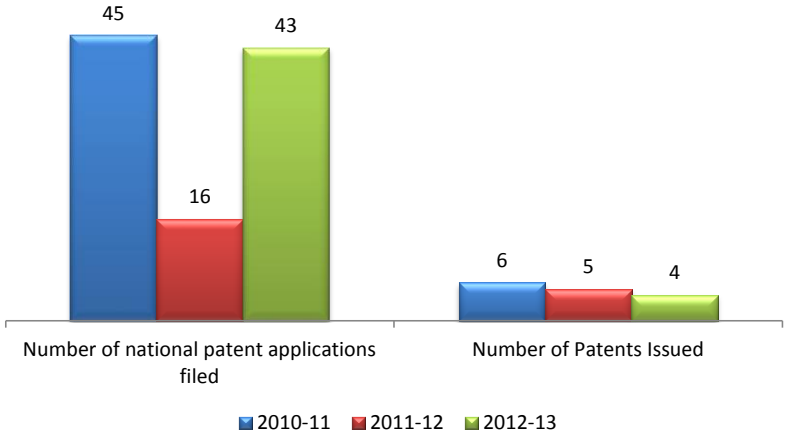
See Figure 11 for total number of invention disclosure, provisional patent and PCT applications filed by fiscal year. Invention disclosures are primarily internal BCCA documents, filed with TDO to inform the decision of whether or not to proceed with the patent process. The next stage in the patent process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

Figure 11
Total # of Invention Disclosures, Provisional Patent and PCT Applications Filed by Fiscal Year



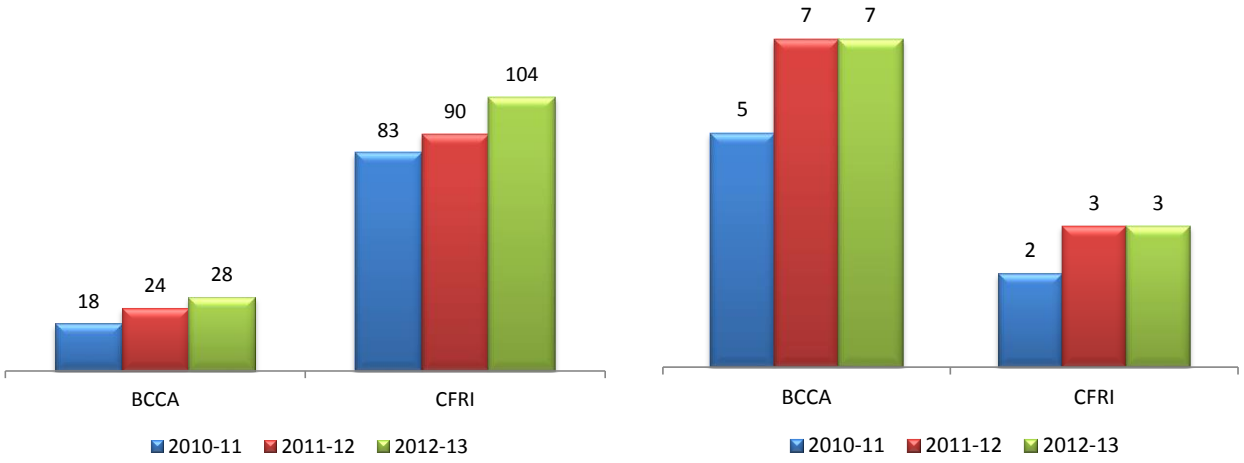
Patents are reported in Figure 12 below. Applications filed in a given year represent different applications than those which are approved in that same year (which typically are the result of applications in previous years).

Figure 12
Total # of National Provisional Patent Applications Filed by Fiscal Year



Licensing agreements have increased and the number of spin-off companies remained the same for FY 2012-13. (see Figure 13). Both License Agreements and Spin-off companies can expire during the fiscal year.

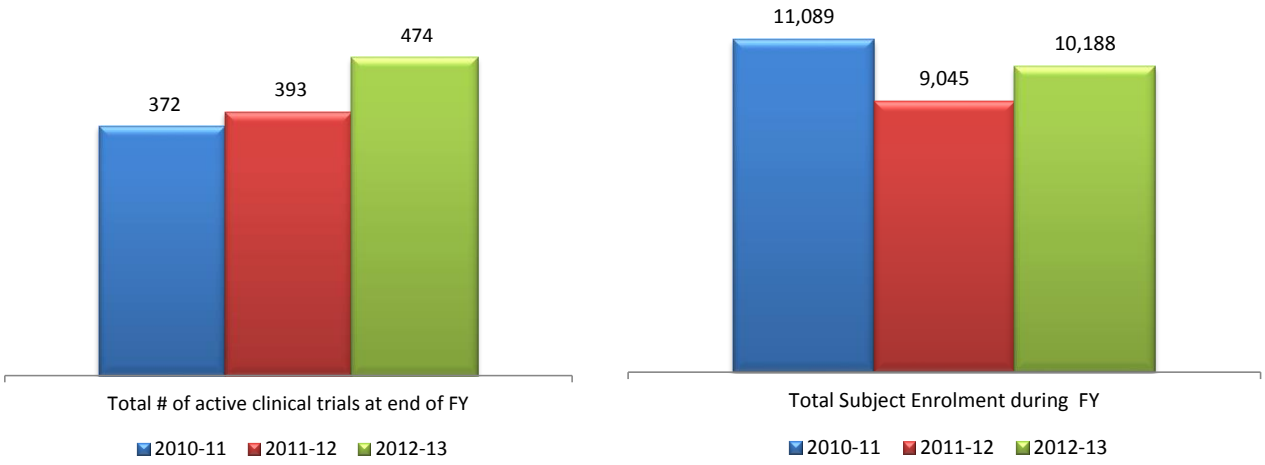
Figure 13
License/Assignment Agreements (left) and Spin-Off Companies (right) by Fiscal Year



Advancing Health and Policy Benefits

To measure advancement of health and policy benefits, PHSA is providing clinical trial data for three fiscal years. Collection of data is still challenging and inconsistent across sites. An increase in the number of clinical trials of 81 was experienced in FY 2012-13. Total subject enrolment in clinical trials across PHSA research entities during FY 2012-13 was 10,188 (see Figure 14). 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 Subject Enrollment by Fiscal Year



Achievements in advancing health and policy benefits were collected, for a fourth year, through a survey issued to all reporting entities. The survey asked respondents to identify guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2012-13 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. Specific survey responses are reported under each agency/reporting entity section and document important achievements in translational research.

BC Cancer Agency (BCCA)

Producing and Advancing Knowledge

In FY 2012-13, researchers affiliated with BCCA were awarded a total of $63,461,379 in research funding, an increase of 2.5% from FY 2011-12. The amount awarded as Operating Grants ($54,309,240) makes up 85.6% of total funding received. A breakdown of funding types and subtypes, including and excluding major CFI grants, can be found in Figures 15 and 16. Total funding, excluding major CFI grants, remained largely unchanged. BCCA's portion of the Indirect Costs Program grant for FY 2012-13 is $1, 187,612, but is not included in total research funding or the figures below.

Figure 15

Total BCCA Research Funding including Major CFI grants by Funding Type and Sub-type

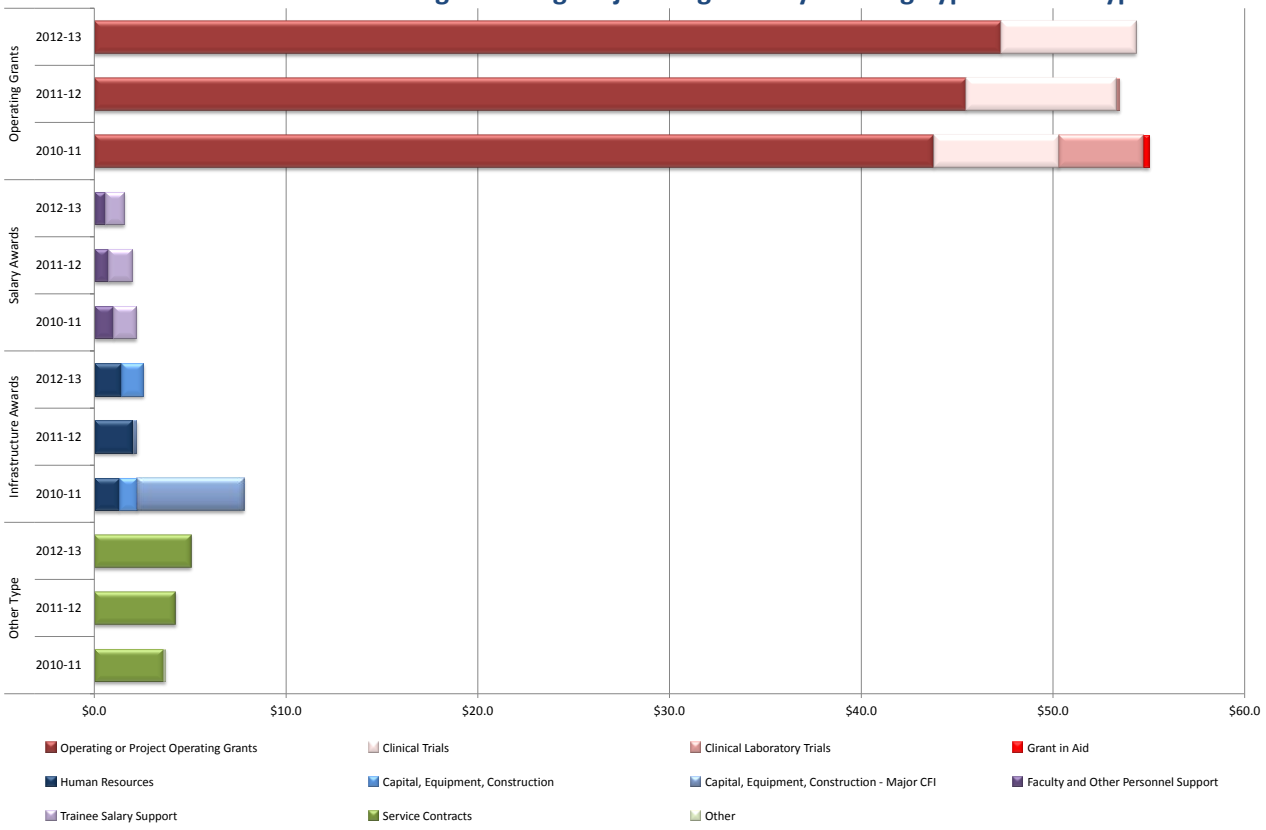
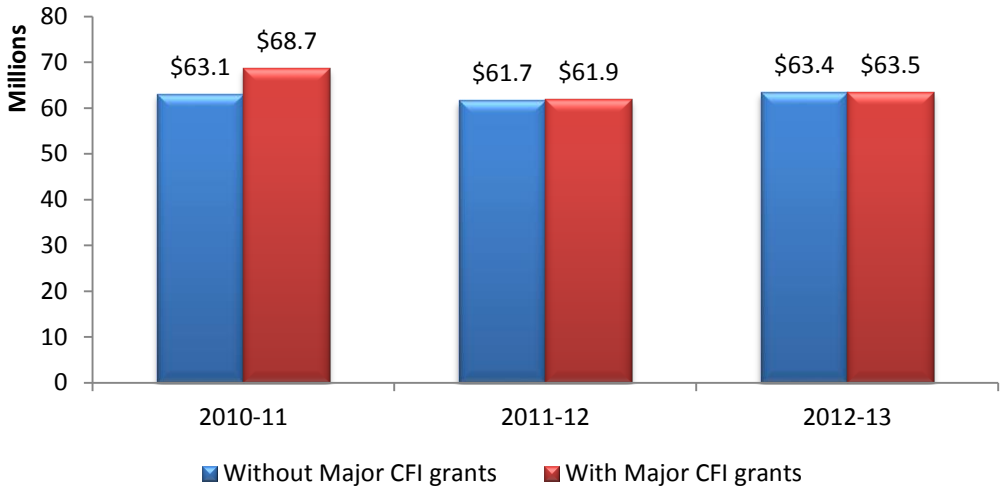


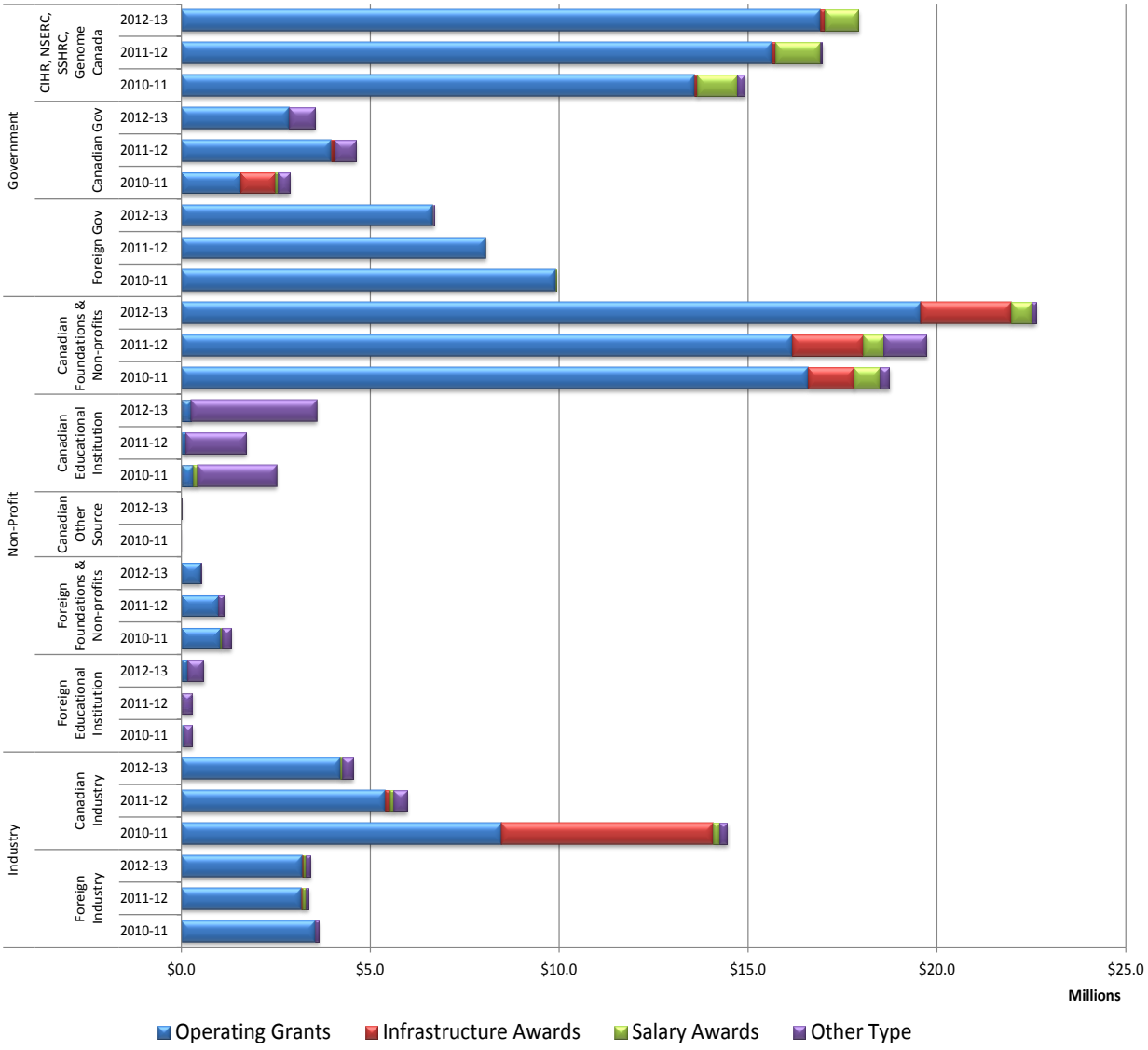
Figure 16

Total BCCA Research Funding Totals With/Without Major CFI Grants



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, NSERC, SSHRC and Genome Canada). Of note is the steady decrease in both Foreign Government and Canadian Industry funding types over the three-year period. Figure 17 details the major funding categories by funding type. Funding sources are detailed in Appendix 6.

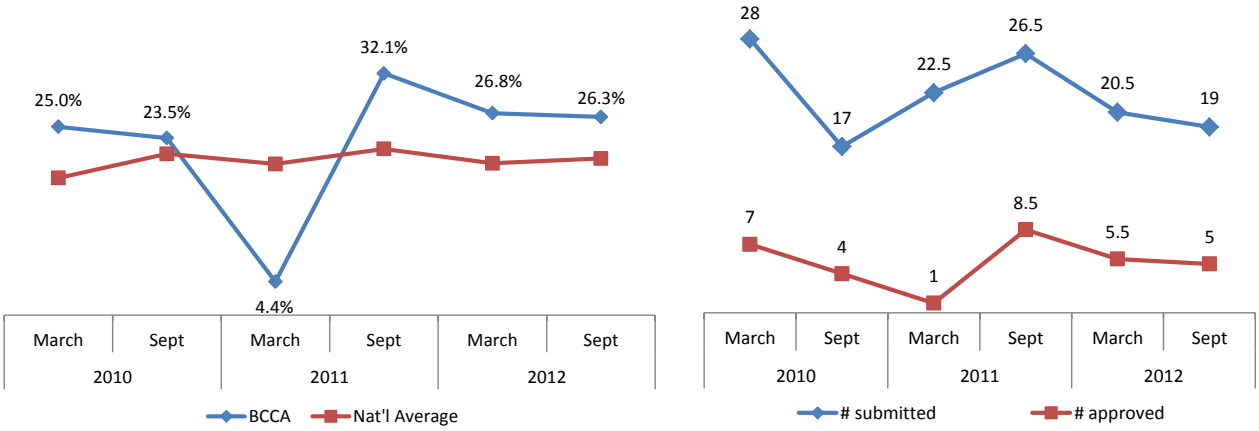
Figure 17
BCCA Research Funding, including Major CFI grants by RISe Sector and Funding Source Category by Type



BCCA has demonstrated success in recent CIHR operating grant competitions, exceeding the national average for both the March and September 2012 competitions. Figure 18 below shows CIHR grant application success rates for BCCA compared to the national average as well as number of applications submitted and approved.

Figure 18

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



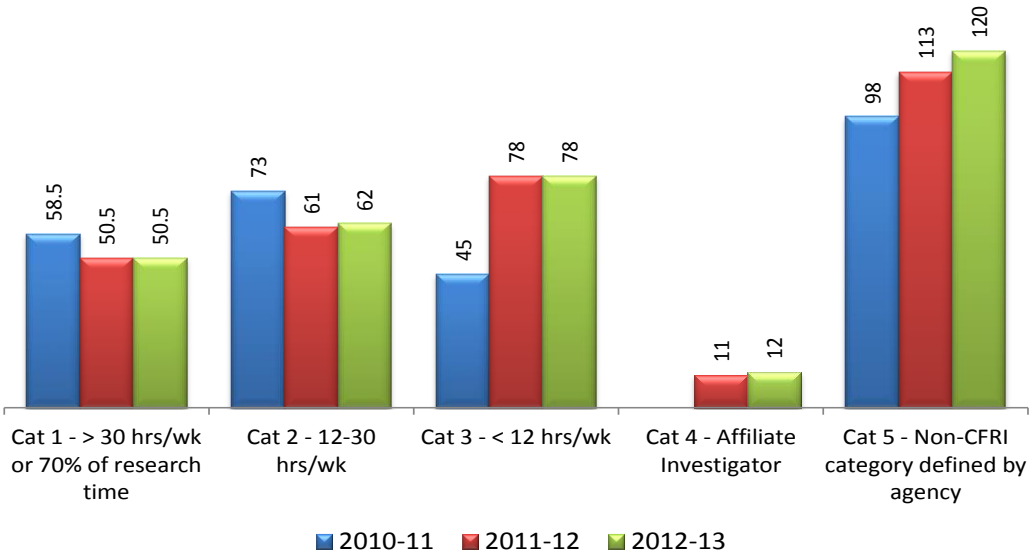
Total number of publications by type and category, is collected for a second year in FY 2012-13. BCCA reported a total of 429 published journal articles, an increase of 18% over last year, all of which are peer reviewed. Peer review represents the gold standard for scientific credibility. The agency total represents the number for 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.

Building Research Capacity

BCCA has a total of 310.5 researchers in FY 2012-13 in categories 1-3 and 5 (up 8 from FY 2011-12). While adoption of the CFRI category classifications is in place, a significant amount (120) 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 19 for the number of researchers by category.

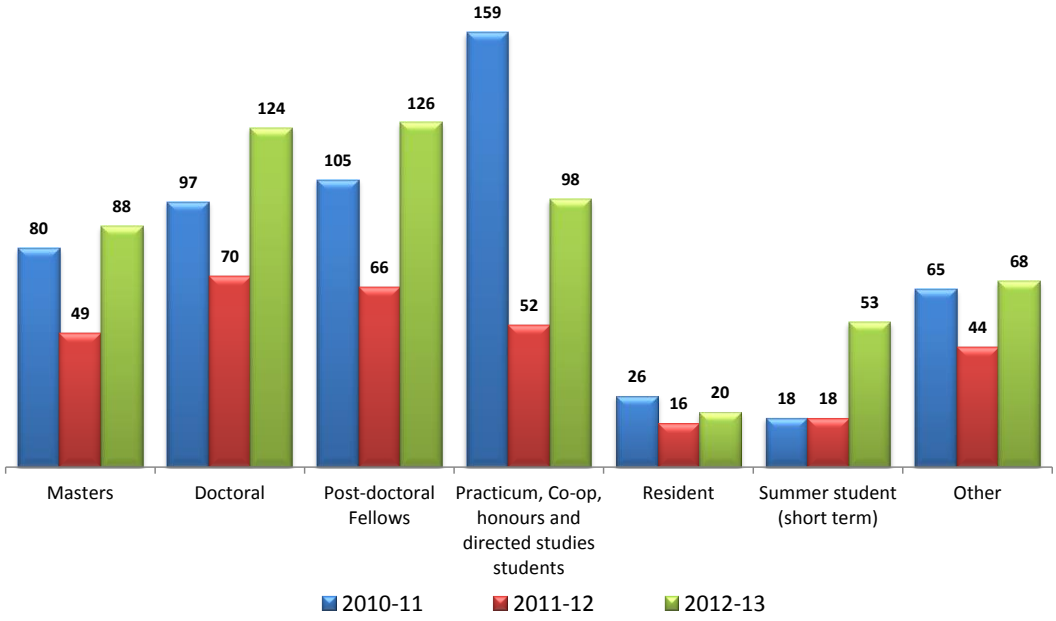
Figure 19

Total Number of BCCA Researchers by Category and Fiscal Year



During FY 2012-13, BCCA researchers provided training and supervision to a total of 577 trainees (up 262 from FY 2011-12 The Masters, Doctoral, Post-doc Fellow and Practicum, Co-op Students categories all increased more than 40%, while the largest increase was seen in the Summer Student category (66%). See Figure 20 for the number of trainees by type.

Figure 20
Total Number of BCCA Trainees by Type and Fiscal Year

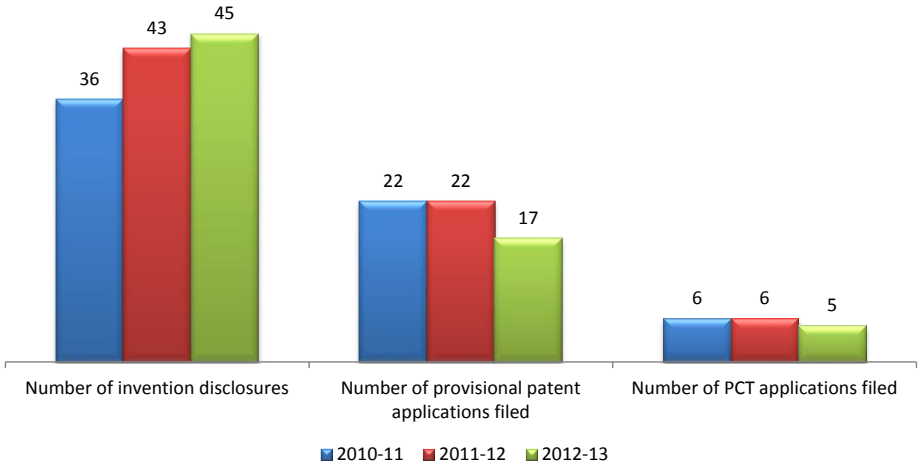


Achieving Economic Benefits and Innovation

BCCA Technology Development Office (TDO) Activities

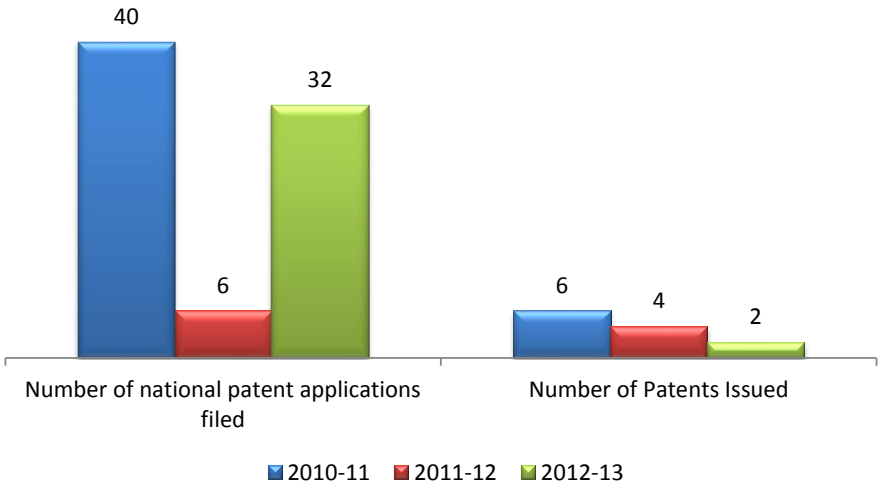
Patent Activity has remained relatively stable over the last three fiscal years. Invention disclosures are primarily internal BCCA documents, filed with TDO to inform the decision of whether or not to proceed with the patent process. The next stage in the patent process is to file provisional patent applications followed by patent cooperative treaties, or PCTs, which act as gateway world-wide patents. See Figure 21 for patent activity statistics.

Figure 21
BCCA TDO Invention Disclosures, Provisional Patent and PCT Applications by Fiscal Year



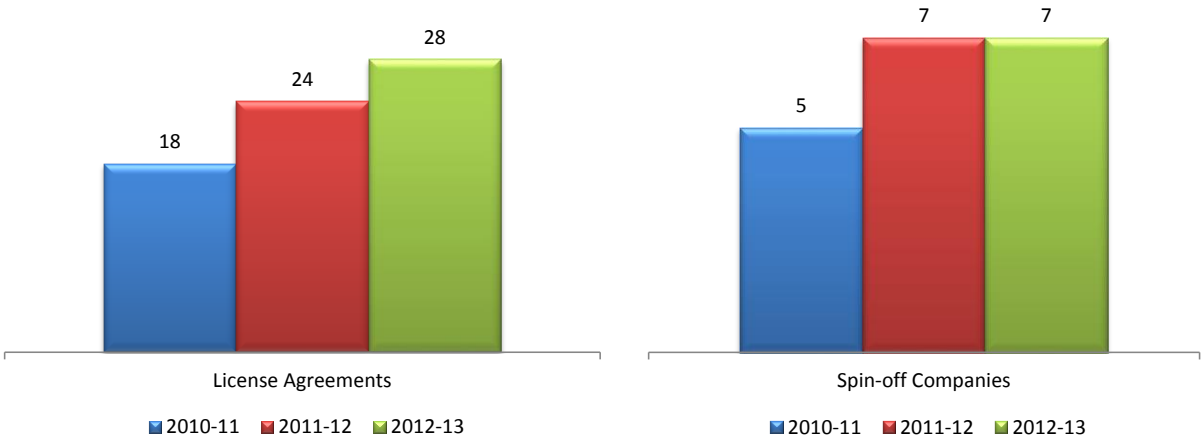
National patent applications are then filed with each step involving greater specificity. Patent applications filed in a given year represent different applications than those which are approved in that same year (which typically are the result of applications in previous years). The number of national patent applications filed last year included a number of new national phase applications relating to an earlier license for a skin cancer detection device (15 applications) and a new license for a HPV vaccine to a French company (15 applications). See Figure 22 for a breakdown by fiscal year.

Figure 22
BCCA TDO National Patent Activity by Fiscal Year



In FY 2012-13, there were 28 (up 4 from last year) active license agreements (see Figure 23). There was one new spin-off company created; Signal Chem Lifesciences. Other active Spin-off companies include Aquinox Pharmaceuticals, Essa Pharmaceuticals, Repeat Diagnostics, Upstream Biosciences, and Verisante.

Figure 23
BCCA License Agreements (left) and Spin-Off Companies (right) by Fiscal Year



In FY 2010-11 members of the Research Metrics working group re-defined the reporting of IP related revenue in accordance with UBC (University Industry Liaison Office UILO) definitions (see Glossary – Appendix 4). See Table 1 for a comparison of the last three fiscal years. 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 1
TDO IP Related Revenue

IP Related Revenue	FY 2010-11	FY 2011-12	FY 2012-13
Royalties	94,276.55	588,335.85	343,954.18
Equity Liquidated			36,177.85
License Fees	138,270.00		10,000.00
License Management			272,601.94
Option Fees			9,350.00
Technology Assignment			56,100.00
Gross Licensing Revenue (total)	**232,546.55**	**588,335.85**	**728,183.97**
Expenses for patenting, legal & related costs	121,570.00	233,109.39	493,311.77
Net Licensing revenue	**110,976.55**	**355,226.46**	**234,872.20**
Realized Revenue per distribution agreement	$21,585.04	$70,334.84	$75,519.33

Advancing Health and Policy Benefits

BCCA manually collects the total number of accrued (or enrolled) patients to clinical trials. Table 2 presents the numbers of patients accrued/enrolled in each of fiscal years 2010-11, 2011-12 and 2012-13. The # of trials increased by 22 and total subject enrollment decreased substantially due to the closure of several large studies.

Table 2
BCCA Clinical Trials

	10-11	11-12	12-13
Total Number of Clinical Trials active during the FY	252	280	302
Status of the Trial as of March 31 in the FY:			
Total Number of Active Trials	224	225	268
Total Number of Trials that closed during the FY	28	55	34
Enrolment Numbers:			
Expected Local Subject Enrolment (for the term of the study)	34,829	35,088	3,516
Total Subject enrolment to March 31 of the FY	23,382	28,082	29,473
Total Subject enrolment during the period April 1 to March 31 of the FY	8,934	5,639	1,189

Following are key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2012-13 as a result of research driven by BCCA researchers, and their corresponding benefits. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 3
BCCA Outcome Survey Responses

Guideline, drug, diagnostic agent, or device adopted or approved in FY 2012-13 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
BCCA Scientists have reclassified breast cancer into 10 subtypes grouped by common genetic features, which correlate with survival. They have also discovered several completely new genes that had never before been linked to breast cancer, and the relationship between these genes and known cell signalling pathways has been identified. This information will be available to scientists worldwide to boost drug discovery and development.	This new information could change the way breast cancer is diagnosed and form the basis of next-generation treatments. In the future, this information could be used by doctors to better tailor treatment to the individual patient.
In partnership with clinicians at The Hospital for Sick Children (SickKids) in Ontario and 46 cancer centres around the world, Scientists at the BCCA's Michael Smith Genome Sciences Centre (GSC) are obtaining a DNA-level understanding of medulloblastoma, the most common form of childhood cancer. The team has determined that medulloblastoma can be stratified into four distinct subgroups, each of which has a different prognosis when treated with chemotherapy, radiation and drug therapy.	Paediatric cancer patients are one step closer to being treated with new, less toxic and more precise drug therapies.
A BC research team, led by BCCA Scientist Miriam Rosin, has identified a set of molecular markers that can better determine whether individuals with oral pre-cancerous lesions are at high risk of having those lesions progress to oral cancer. Their analysis successfully identified a change in the DNA of genes in specific chromosomes that have been shown to be highly predictive of the development of oral cancer. The findings were published in *Cancer Prevention Research* and represent the only large-scale population study with long-term follow up of oral cancer.	There is now a way to differentiate low-risk from high-risk lesions, allowing clinicians to identify more appropriate procedures to use on patients and spare individuals with low-risk lesions the discomfort of aggressive treatment.
BCCA Scientist Aly Karsan developed a method to detect mutations in two genes, BRCA1 and BRCA2, using cutting-edge technology called next-generation sequencing. The test was transferred into the clinic through the BCCA Cancer Genetics Lab and the Centre for Clinical Genomics, which are the first labs in Canada to use this novel technology in routine clinical testing. The research was funded by Genome BC.	Individuals with BRCA1 or BRCA2 mutations have increased risk for developing breast, ovarian and other cancer. The test allows increased capacity of testing at a reduced cost (10% cheaper). The capacity afforded by using the new technology allowed the reduction of wait time for receiving test results from 14 months to 4 months, and it is expected to be reduced further to ~2 months. By identifying a mutation in one of these genes, family members of the individual with a mutation can also be tested, and, if positive, be counseled about preventive strategies, which include removal of the ovaries and fallopian tubes, mastectomy and/or better screening.
BCCA Scientists have helped to discover a new type of retinoblastoma. Most retinoblastomas are caused by mutations in the RB1 gene. The new findings, published in the journal *Lancet Oncology*, have	The significance of retinoblastomas caused by the MYCN mutation is that the mutation is not inherited, which means that there is no need to monitor the child's unaffected eye or investigate other family members for indications of the disease.

Guideline, drug, diagnostic agent, or device adopted or approved in FY 2012-13 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
identified retinoblastomas caused by changes in the MYCN gene. MYCN gene mutations, unlike those which can occur in RB1, are not inherited.	
The BCCA Cancer Genetics Lab (CGL) is now offering real-time PCR testing for BRAF V600 mutations in unresectable and metastatic melanoma. Treatment of patients with metastatic melanoma with BRAF inhibitors was approved by Health Canada in February 2012. Clinical trials have demonstrated significant improvements to overall survival rates and reduced risk of tumour progression for patients positive for BRAF V600E mutations who are treated with the BRAF inhibitor vemurafenib.	The assay developed by UBC, in collaboration with the Cancer Genetics Lab, has a lower limit of detection than commercial tests, a quicker turnaround and a lower cost.
BCCA Scientists have decoded the genetic make-up of triple negative breast cancer, which is defined by three missing cancer-causing proteins (the estrogen receptor, progesterone receptor and ERBB2 receptor). The study, published online in the international journal *Nature*, reveals that this form of cancer is an extremely complex and evolved tumour with an unprecedented range of mutations. Operating with the complexity of a mini ecosystem, triple negative breast cancers' evolution before diagnosis may explain its ability to evade current therapies, earning it the distinction as the deadliest form of breast cancer. The research team unmasked this evolving cellular "ecosystem" and can now estimate how the genetic mutations evolved prior to diagnosis.	This discovery could lead to more effective treatments of triple negative breast cancer.
BCCA Scientist Helena Daudt was a key collaborator on a national initiative co-lead by BCCA Scientist Peter Watson. She led the development of Education Modules on Biobanking for the CTRNEt (Canadian Tumour Repository Network). CTRNet launched a Certification Program nationally (recently endorsed by the International Society for Biological and Environmental Repositories -ISBER) on March 2013 and the Education Modules are integral to the Certification Program.	The Certification Program aims to: - Promote common standards across biobanks and support all bio specimen based translational research, - Provide educational resources for new and existing biobanks to facilitate adoption of these standards, and - Foster public confidence that biobanks strive to meet best practice standards in Canada. The Education Modules are key to facilitate the adoption of the common standards, thus contributing to foster public confidence in biobanking.
BCCA Scientist Richard Gallagher and Dr. John McLaughlin from Toronto conducted a major review of the relationship between solar and artificial ultraviolet radiation and skin cancer for Toronto Public Health. The review focused particularly on the relationship between use of indoor tanning equipment (sun beds, sunlamps, tanning booths) and the 3 principal types of skin cancer (melanoma, basal and squamous cell carcinoma). The review also examined potential positive effects of indoor tanning such as increasing serum levels of vitamin D. The report is being used by Toronto Public Health (and the Ontario Ministry of Health) as the scientific report buttressing the attempt	The report highlights the significant increase in risk for all 3 types of skin cancer inherent in indoor tanning. As noted, the report provides scientific basis for introduction of legislation in Ontario to control use of indoor tanning equipment by young people.

Guideline, drug, diagnostic agent, or device adopted or approved in FY 2012-13 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
to introduce legislation on use of indoor tanning equipment in Ontario	
The BCCA Vancouver Centre Radiation Oncology Department approved the Bayer 16216 Protocol: Radium-223 Dichloride (Alpharadin) in Castration-Resistant (Hormone-Refractory) Prostate Cancer Patients with Bone Metastasis.	This study will provide BCCA Vancouver patients who have castration-resistant prostate cancer with bone metastasis access to treatment with radium dichloride, an alpha omitting radiopharmaceutical that was not previously available as a treatment option at the BCCA. Demonstrated benefits of radium chloride in treating bone metastasis include decreased toxicities associated with treatment while improving treatment outcomes, specifically median overall survival.
BCCA Scientist Mira Keyes and her team recently published a study on the relationship of DNA ploidy in tumour biopsies to the predicted outcomes of prostate cancer. Dr. Keyes' team found that DNA ploidy may be a useful clinical marker for determining the aggressiveness of localized prostate cancer.	From a patient care perspective, this study shows that measuring DNA ploidy has the potential to predict prostate-specific antigen failure after prostate brachytherapy.
Chemo SmartBook is an innovative computer-based scheduling system developed by BCCA Scientist Scott Tyldesley and his Operational Research Team. It has been awarded an Excellence in BC Award from the Health Employers Association of British Columbia in the category of "Top Innovation – Health Authority". Chemo SmartBook automatically assigns patients to nurses, balances workloads, alerts pharmacists of daily patient schedules and considers patient appointment preferences. Its easy-to-use web-based interface allows schedulers to arrange and communicate patient appointments, often immediately after chemotherapy is prescribed; replacing a daunting paper-based scheduling system. Chemo SmartBook has been used daily at the Vancouver Cancer Centre for three years already and at the Centre for the Southern Interior for the last six months. Work is now underway to extend its use to the BCCA Abbotsford Cancer Centre, while several other cancer centres across Canada have expressed interest in Chemo SmartBook.	Since its June 2010 launch by the BC Cancer Agency at its Vancouver Centre, Chemo SmartBook has reduced the number of patients who receive fewer than seven days notice of an appointment by 58 per cent and decreased the number of waitlisted patients by 84 per cent. Patient surveys have confirmed heightened satisfaction with the appointment booking process, and staff feedback has reported improved nursing workload distribution and reduced stress levels.

Child & Family Research Institute (CFRI)

Producing and Advancing Knowledge

In FY 2012-13, researchers affiliated with CFRI were awarded a total of $53,539,943 in research funding, a 5% decline from last FY. The amounts awarded as Operating Grants ($36,645,617) and Salary Awards ($9,484,394) make up approximately 86% of total funding received. A breakdown of funding types and subtypes can be found in Figure 24. Figure 25 shows that Major CFI Infrastructure awards continue to decline as seen in previous years. CFRI's portion of the Indirect Costs Program grant totaled $1,824,514 for FY 2012-13 but is not included in total research funding or the figures below.

Figure 24

Total CFRI Research Funding including Major CFI grants by Funding Type and Sub-type

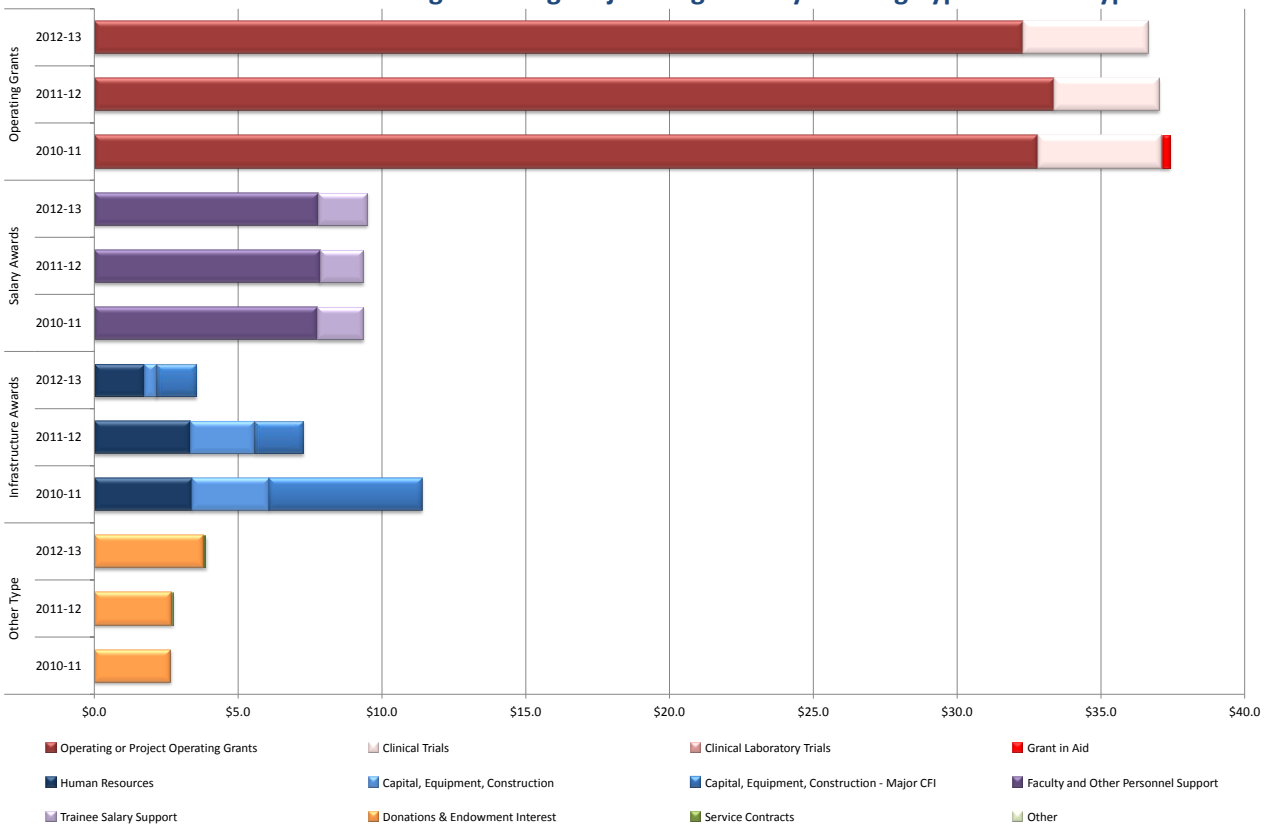
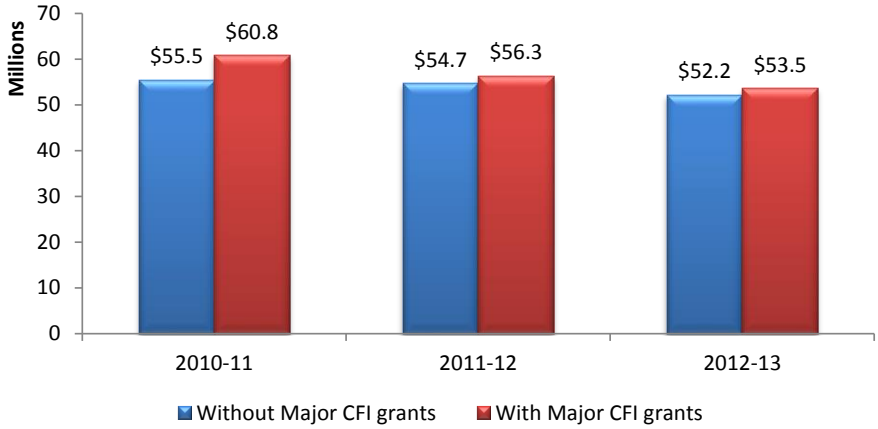


Figure 25

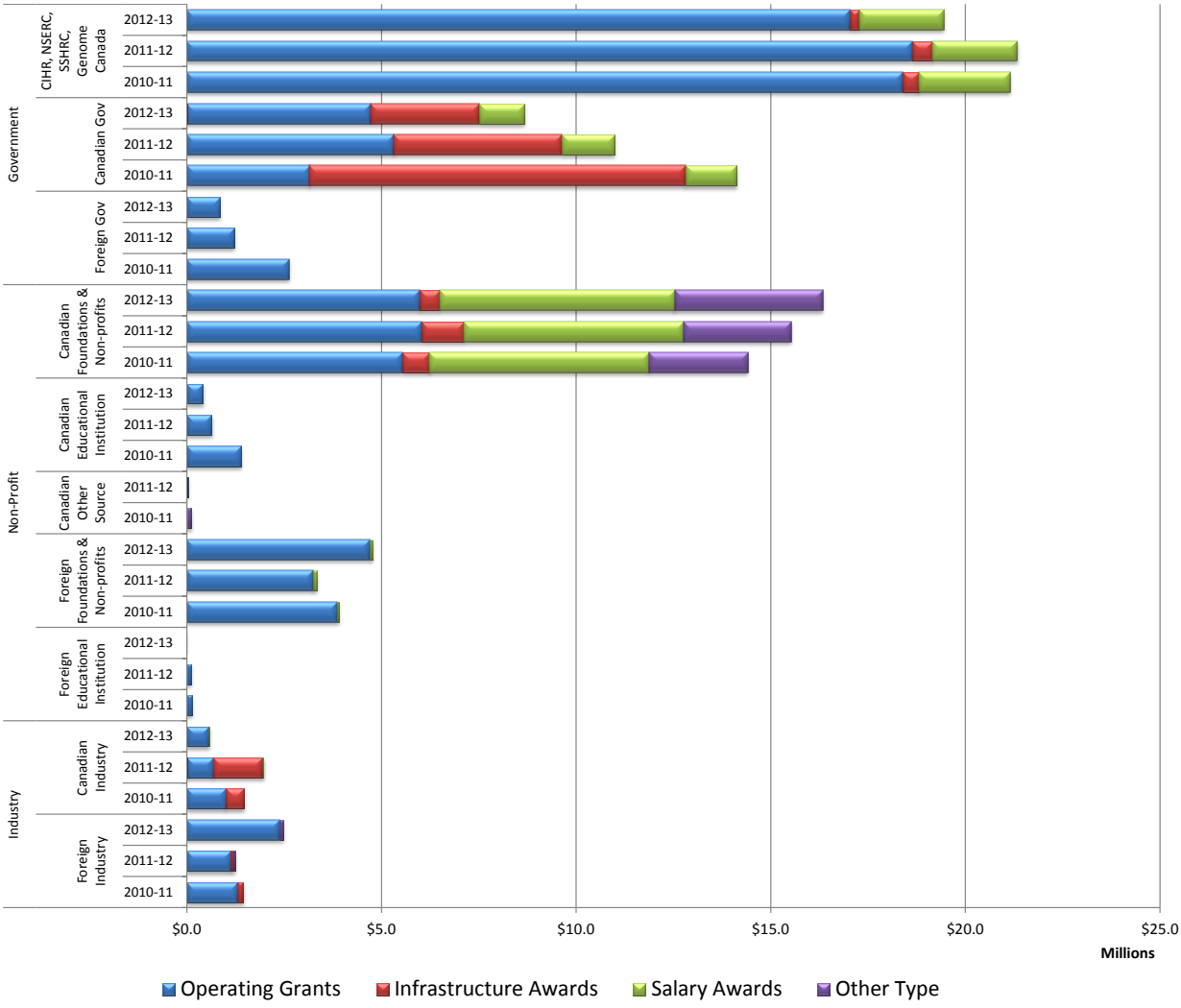
Total CFRI Research Funding Totals With/Without Major CFI Grants



The top three funding categories are Major Canadian Funding Entity (36%), Canadian Charity (31%) and Canadian Government (16%). Figure 26 details the RISe sector and funding categories by funding type. Funding sources are detailed in Appendix 7.

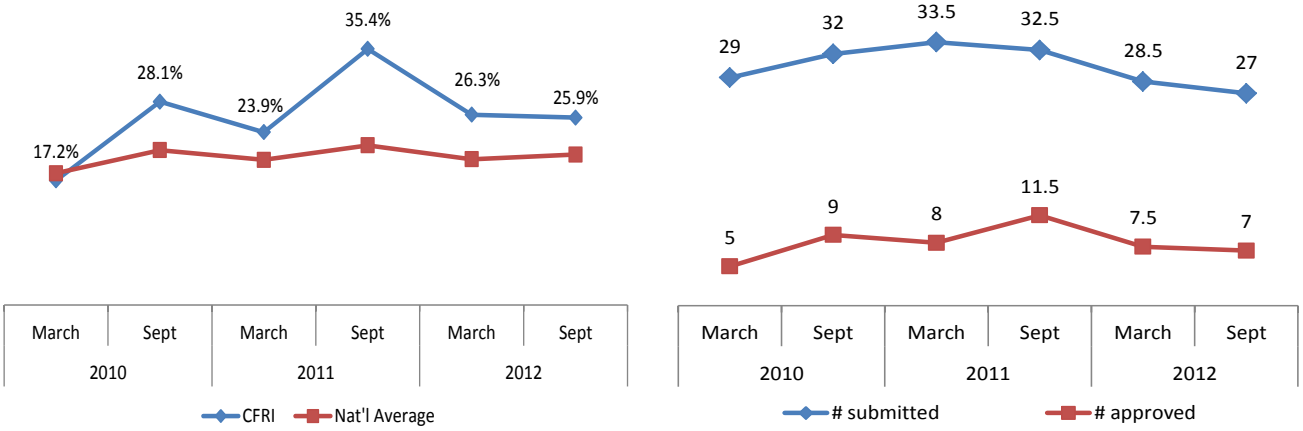
Figure 26

CFRI Research Funding, including Major CFI grants by RISe Sector and Funding Source Category by Type



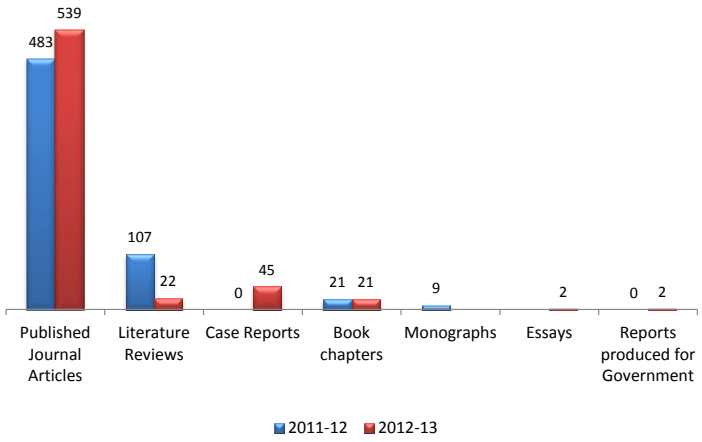
CFRI has demonstrated success in recent CIHR operating grant competitions, exceeding the national average in both competitions in FY 2012-13. Figure 27 below shows the revised competition results (which occur in instances when, after the initial funding announcement, one of the CIHR Institutes decides to support highly ranked applications that have just missed the cut-off by providing a bridging award) and number of applications submitted and approved.

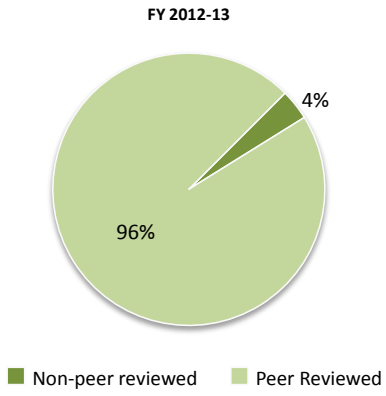
Figure 27
CFRI's CIHR Operating Grant Application Success Rate & Number of Applications Submitted/Approved



Total number of publications by type and category of peer vs. non-peer reviewed, is collected for the second year in FY 2012-13. See Figure 28 for a breakdown by type and category. 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 accepts case reports, essays, e-journals and government proceedings but they do not categorize them into these subcategories.

Figure 28
Total Number of CFRI Publications by Type and Category

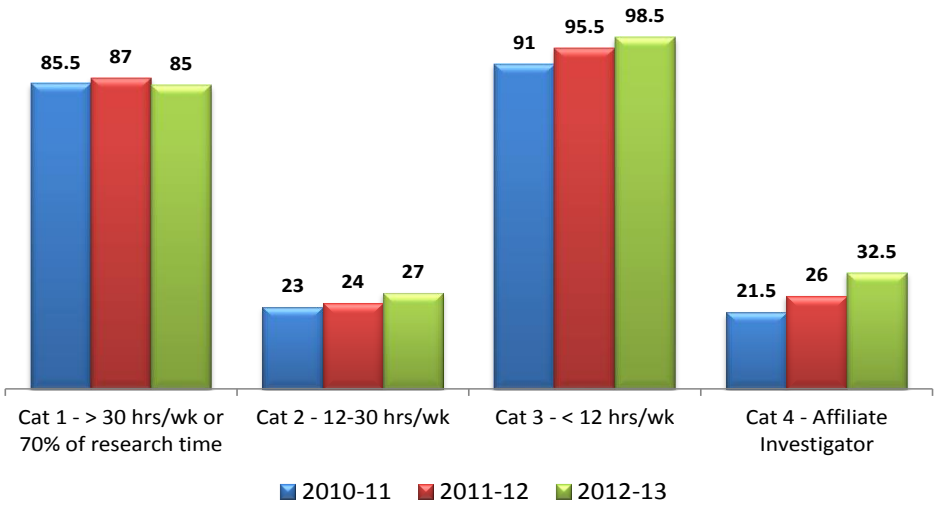




Building Research Capacity

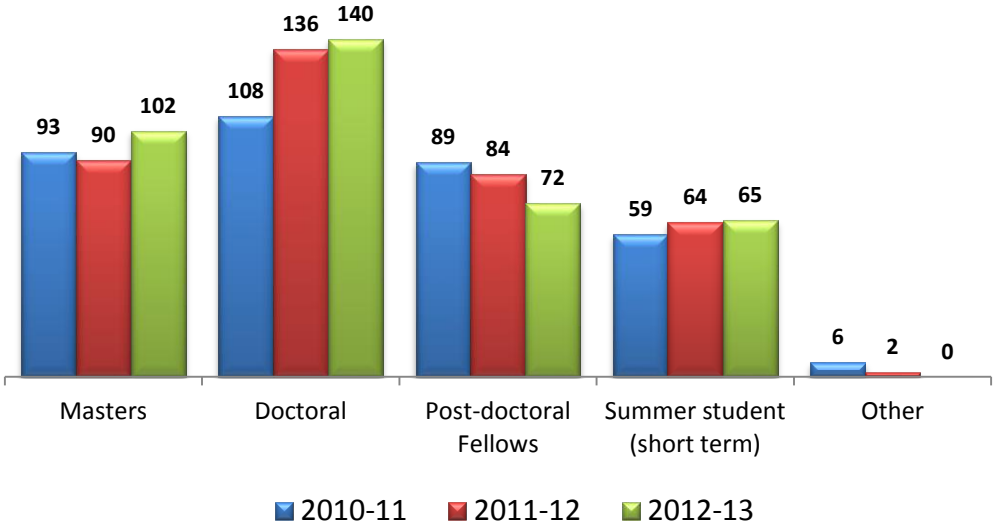
CFRI has a total of 210.5 researchers in categories 1-3. The distribution of these researchers is represented in Figure 29. Researchers in categories 1-3 are primarily based on the Children's & Women's Health Centre of BC campus with the largest proportion of the members being split between Category 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 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 29
Total Number of CFRI Researchers by Category



During FY 2012-13, CFRI researchers provided training and supervision to a total of 379 (up 3 from FY 2011-12) trainees. See Figure 30 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.

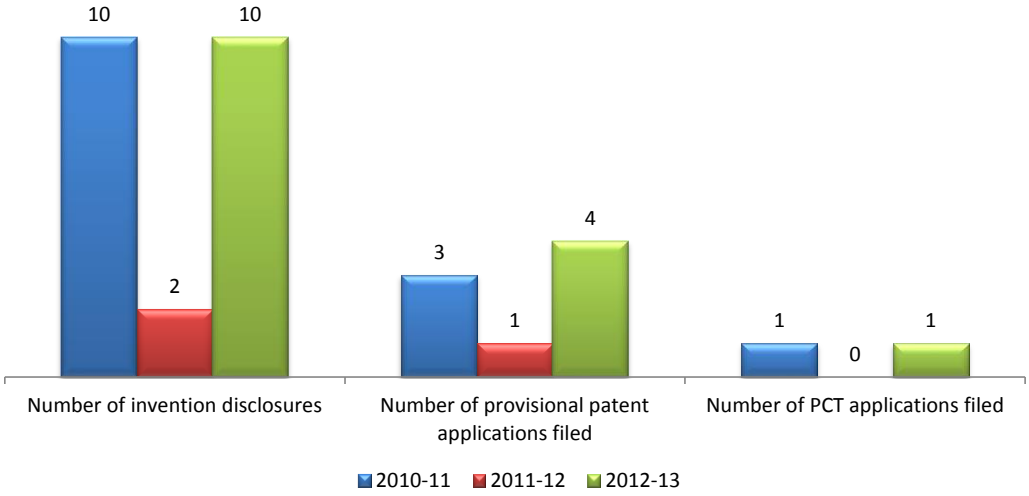
Figure 30
Total Number of CFRI Trainees by Type



Achieving Economic Benefits and Innovation

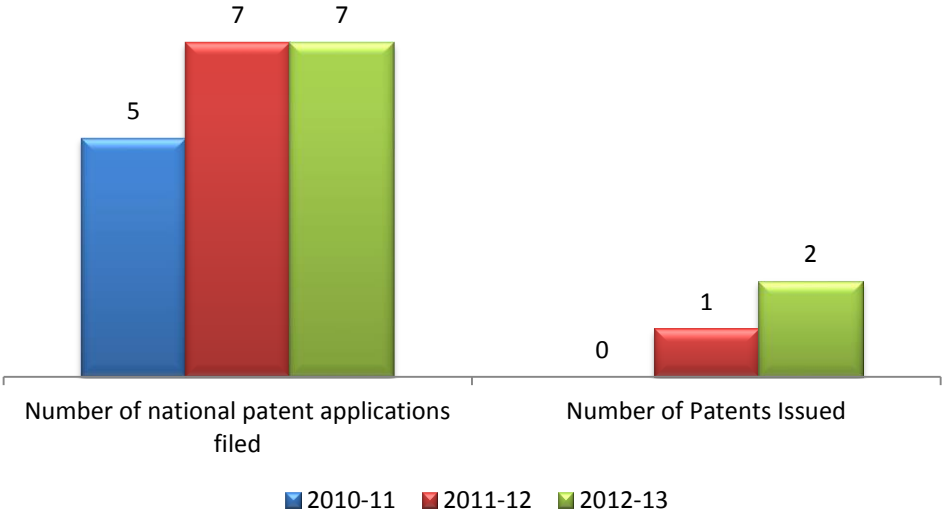
The number of invention disclosures, provisional patent and PCT applications filed by fiscal year are in Figure 31.

Figure 31
CFRI Invention Disclosures, Provisional Patent and PCT Applications Filed by Fiscal Year



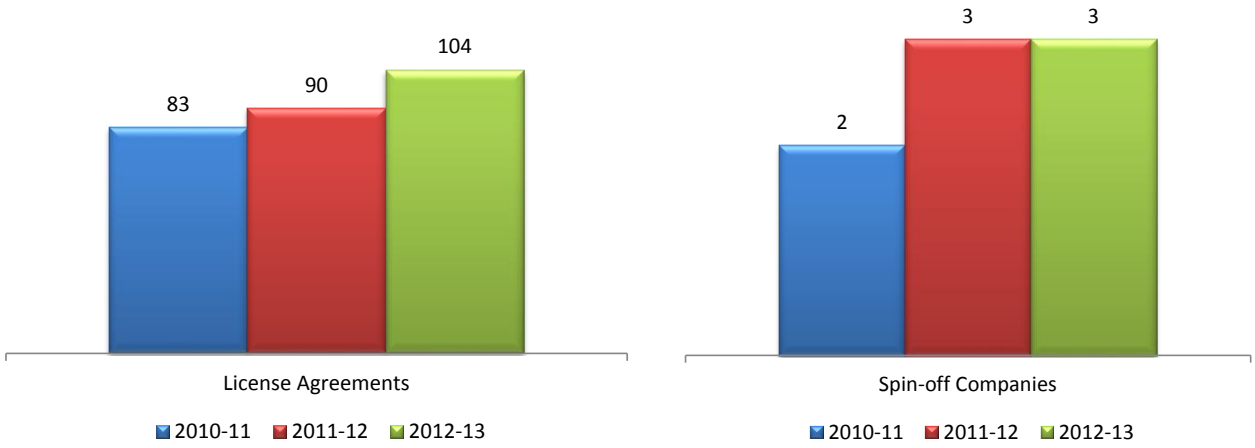
Patents are reported in Figure 32 below. Applications filed in a given year represent different applications than those which are approved in that same year (which typically are the result of applications in previous years). Data is collected and reported by the University of British Columbia University-Industry Liaison Office (UILO).

Figure 32
CFRI National Patent Activity by Fiscal Year



In FY 2012-13 there were 104 (up by 14) active license/assignment agreements in place (See Figure 33). Currently, three spin-off companies have been created. CFRI holds shares in four companies – Urodynamix Technologies (publicly traded), BCY Lifesciences (publicly traded), and Lions Gate Technologies., which became inactive in FY 12-13. Xenon Pharmaceuticals (private) is held in trust by UBC so is not included in the totals below.

Figure 33
CFRI License/Assignment Agreements (left) and Spin-off Companies (right) by Fiscal Year



In FY 2010-11, members of the Research Metrics working group re-defined the reporting of IP related revenue in accordance with UBC (University Industry Liaison Office UILO) definitions (see Glossary). See Table 4 for CFRI data by fiscal year. For CFRI, UILO covers all patent, legal and related costs prior to distribution of any revenue amounts. As a result, CFRI is only able to report net licensing revenue, per the distribution agreement, not gross. Until UBC has recovered all of their Patent and Legal costs on a file by file basis, there is no distribution of revenues to C & W.

Table 4
CFRI IP Related Revenue

IP Related Revenue	FY 2010-11	FY 2011-12	FY 2012-13
Royalties	7,833.33	5,617.00	71,896.00
Equity Liquidated			
License Fees			
License Management			
Option Fees			
Technology Assignment	24,723.66		
Gross Licensing Revenue (total)	**32,556.99**	**5,617.00**	**71,896.00**
Expenses for patenting, legal & related costs			
Net Licensing revenue	**32,556.99**	**5,617.00**	**71,896.00**
Realized Revenue per distribution agreement	$32,556.99	5,617.00	71,896.00

Advancing Health and Policy Benefits

The challenge in reporting clinical trial information is that there is no central mechanism to capture information about active clinical trials on the C&W site. For the purposes of this report, data are based on RISe database files that answered "yes" to question 7.11 (a) (Registration for Publication of Clinical Trials) on an application form. Research Coordinators and Managers (PIs, when necessary) were then contacted to obtain enrolment numbers. The majority of clinical trials are likely

included in this data (thanks to the network of coordinators/managers recently put in place) but it is possible that some trials have been missed (see Table 5).

Table 5
CFRI Clinical Trials

	10-11	11-12	12-13
Total Number of Clinical Trials active during the FY	161	174	208
Status of the Trial as of March 31 of FY			
Total Number of Active Trials	127	147	176
Total Number of Trials that closed during the FY	34	27	32
Enrolment Numbers:			
Expected Local Subject Enrolment (for the term of the study)	8,403	5,458	23,938
Total Subject enrolment to March 31 of the FY	4,105	4,015	22,867
Total Subject enrolment during the period April 1 to March 31 of the FY	1,172	2,075	8,642

The following table 6 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2012-13 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 6
CFRI Outcomes Survey Responses

Guideline, drug, diagnostic agent, or device adopted or approved in 2012-13 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
Supported by research at CFRI, new clinical guidelines were prepared and published in May 2013: "Perinatal Services BC: Antidepressant Use During Pregnancy: Considerations for the Newborn Exposed to SSRIs/SNRIs" link to Guidelines New clinical guidelines were published that describe how to care for newborns who were exposed to antidepressant medications (SSRIs and SNRIs) during pregnancy. The guidelines outline the standard for clinical practice in BC for the first 48 hours following the baby's delivery. CFRI researcher Tim Oberlander and post-doctoral fellow Gillian Hanley contributed their expertise on the effects of SSRIs and SNRIs during pregnancy to the committee that developed the guidelines. The guidelines cite publications by Oberlander and CFRI researcher Ron Barr's work on "Period of Purple Crying". CFRI research trainee Hanley and colleagues presented the Guidelines at BC perinatal nursing rounds, and at the annual clinical meeting of the Society of Obstetricians and Gynaecologists of Canada in June 2013.	The guidelines provide advice for health care professionals on monitoring, care, and follow up of newborns exposed to SSRIs or SNRIs during pregnancy. These new guidelines are effectively changing the way these babies are cared for in BC. They introduce non-invasive, easily administered tests to detect any possible complications of exposure earlier. They will hopefully result in earlier discharge of healthy newborns in some areas of the province (areas that were keeping SSRI/SNRI exposed infant in hospital longer) and better care for the infants that experience complications.
Supported by the research conducted at CFRI, six clinical practice guidelines have been finalized for the use of pharmacogenetic tests for six drugs: • Cisplatin – anti-cancer drug that can cause deafness • Anthracyclines – anti-cancer drugs that can cause heart damage and heart failure • Warfarin – a blood thinner used to treat dangerous blood clots and prevent strokes; genetic testing could identify a patient's optimal dose to reduce the risk of bleeding associated with the drug • Codeine – a pain reliever often used after surgery that can be deadly for some infants of breastfeeding mothers, and for children • Carbamazepine – an epilepsy drug that can cause dangerous skin conditions • Tamoxifen – a breast cancer drug that is very effective in some patients, and not effective in others The guidelines were presented to the Canadian Society of Pharmacology and Therapeutics in June 2012. The next steps include publishing the guidelines, and applying for a knowledge translation grant from the Canadian Institutes of Health Research to support developing smartphone and tablet apps for knowledge dissemination.	This work sets the stage for making genetic testing for complications associated with these six drugs more readily available in clinical settings. In this way, patient and physician collaboration will be brought to the next level where these groups work together to individually adapt the safest drug therapies based on genetic information.
Researchers with the Vaccine Evaluation Center at CFRI evaluated the different schedules for Meningitis C (MenC)	This research evaluating the effectiveness of MenC vaccination schedules across Canada will contribute to

Guideline, drug, diagnostic agent, or device adopted or approved in 2012-13 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
vaccine across Canada and found that BC's two-dose regime may be as effective as Alberta's three-dose regime in the short-term. This study was published in the June 2012 issue of *Vaccine.* The research was led by CFRI scientist Julie Bettinger. CFRI senior clinician scientist and head of the Vaccine Evaluation Center, David Scheifele, is a co-author on this study.	the development of more efficient and effective vaccine delivery. Fewer doses would result in substantive savings for the health care system and likely improve compliance rates. Typically, compliance rates are highest for vaccines given in the first year of life at 2, 4 and 6 months. Improving vaccine compliance would reduce the incidence of MenC and save health care resources by preventing visits to the doctor, diagnostic tests, hospital stays and death. This research also has an international impact. The United Kingdom has changed their MenC immunization schedule in infants based on the results from this study as well as research from Europe that showed similar results.
CFRI Clinical Investigator Rick Schreiber led a Canadian Institutes of Health Research (CIHR) funded research study piloting the use of novel, home-based screening for a biliary atresia (BA), a serious and often-fatal liver disorder. The study found that the colour cards of stool colour were highly utilized by the families and that it was a cost effective strategy for early diagnosis of BA. Due to this success, BC Perinatal Services will be implementing a BA Home Screening Program across BC starting in the summer of 2013 by distributing the infant stool colour card to moms following the birth of their baby in hospitals. The research study has been presented at several national and international medical science meetings.	Biliary atresia (BA) is a liver disorder that develops when the bile duct that drains bile from the liver becomes progressively blocked. It is the most common cause of liver failure and the leading reason for liver transplant in the pediatric population. Early diagnosis leading to early intervention is very important. Diagnosis is often delayed due to both the rarity of the condition and the fact that the early symptom, jaundice, is common and usually benign. By encouraging parents to monitor their child's stool colour, the program will lead to earlier diagnosis and earlier intervention which can preserve liver function, delay the need for a liver transplant, and save lives.
CFRI researcher Kirk Schultz led research at CFRI/BC Children's Hospital that contributed to the US Food and Drug Administration (FDA) approval, in January 2013, of a new drug treatment for childhood with a high risk type of blood cancer. Schultz's research was published in October 2009 and has since changed care for these children.	The study showed that adding the targeted drug imatinib mesylate to regular chemotherapy more than doubled the children's three-year survival rates from 30-35 per cent to 87 per cent; the addition of imatinib to chemotherapy caused no serious side effects. This finding supported the FDA change in treatment for imatinib to treat children newly diagnosed with a specific type of acute lymphoblastic leukemia.
Through research and in collaboration with the World Health Organization as part of PIERS on the Move, CFRI researchers audited the essential medicine lists (EMLs) of 144 low- and middle-income countries (identified by the World Bank) that provide comprehensive coverage of pre-eclampsia pharmacotherapy.	While a minor outcome of a much larger project, intended to prevent maternal and infant mortality as a result of preventable complications during pregnancy and birth, these EMLs are currently being used as advocacy tools to ensure the availability of these pre-eclampsia therapies in hospitals in each country.

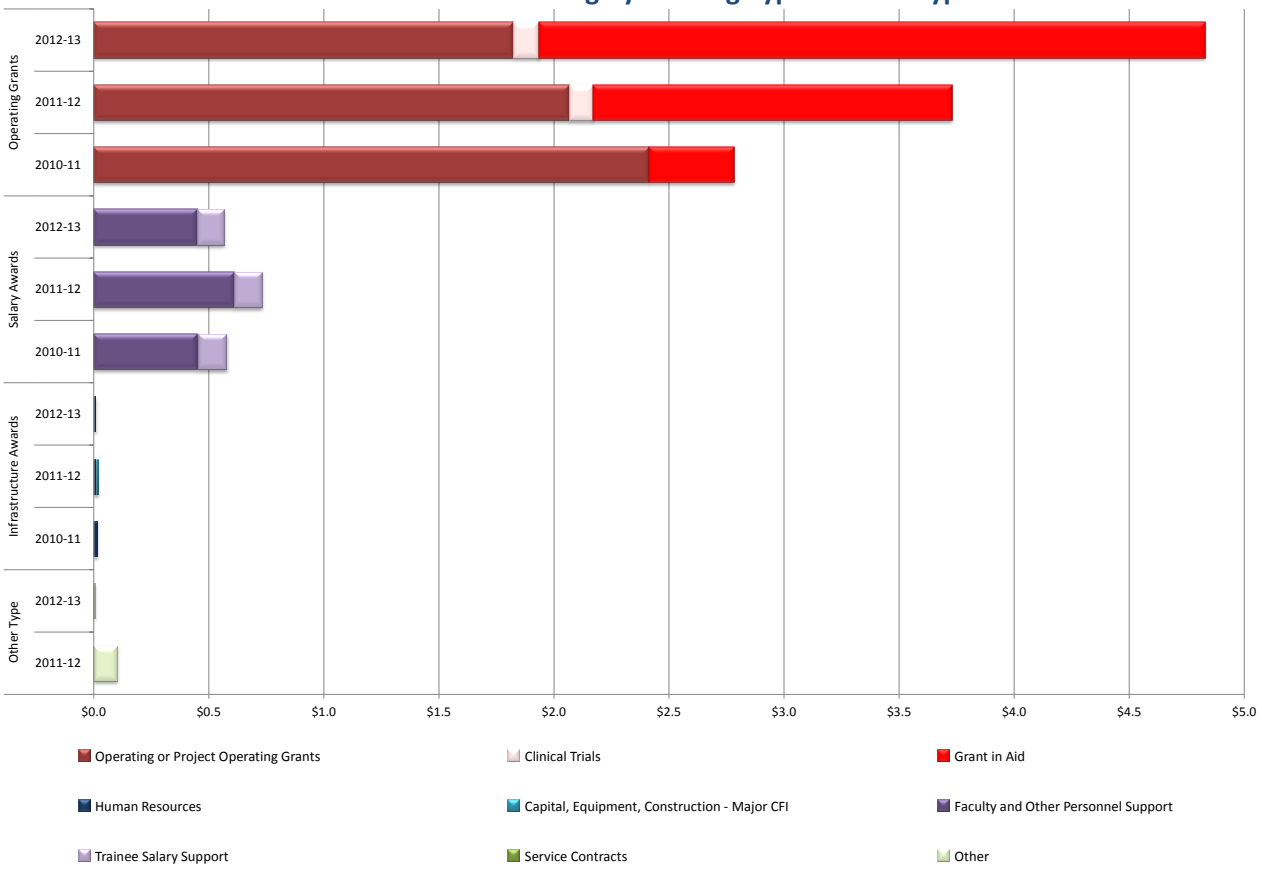
BC Mental Health and Addictions Research Institute (BCMHARI)

Producing and Advancing Knowledge

In FY 2012-13, researchers associated with BCMHARI were awarded a total of $5,407,503 an increase of 15% from FY 2011-12. The increase was the result of a continued increase in grants in aid. Included in this were several sizable grants, including funding support to study maternal variables influencing childhood development and risk for developing psychiatric illness, obsessive compulsive disorder (OCD) research, and drug development and pharmacokinetics in psychiatry. The amount awarded as Operating Grants ($4,829,599) and Salary Awards ($565,584) in FY 2012-13, make up 99.8% of total funding received. A breakdown of funding types and subtypes can be found in Figure 34. BCMHARI's portion of the Indirect Costs Program grant totaled $157,681 for FY 2012-13 but is not included in total research funding or the figures below.

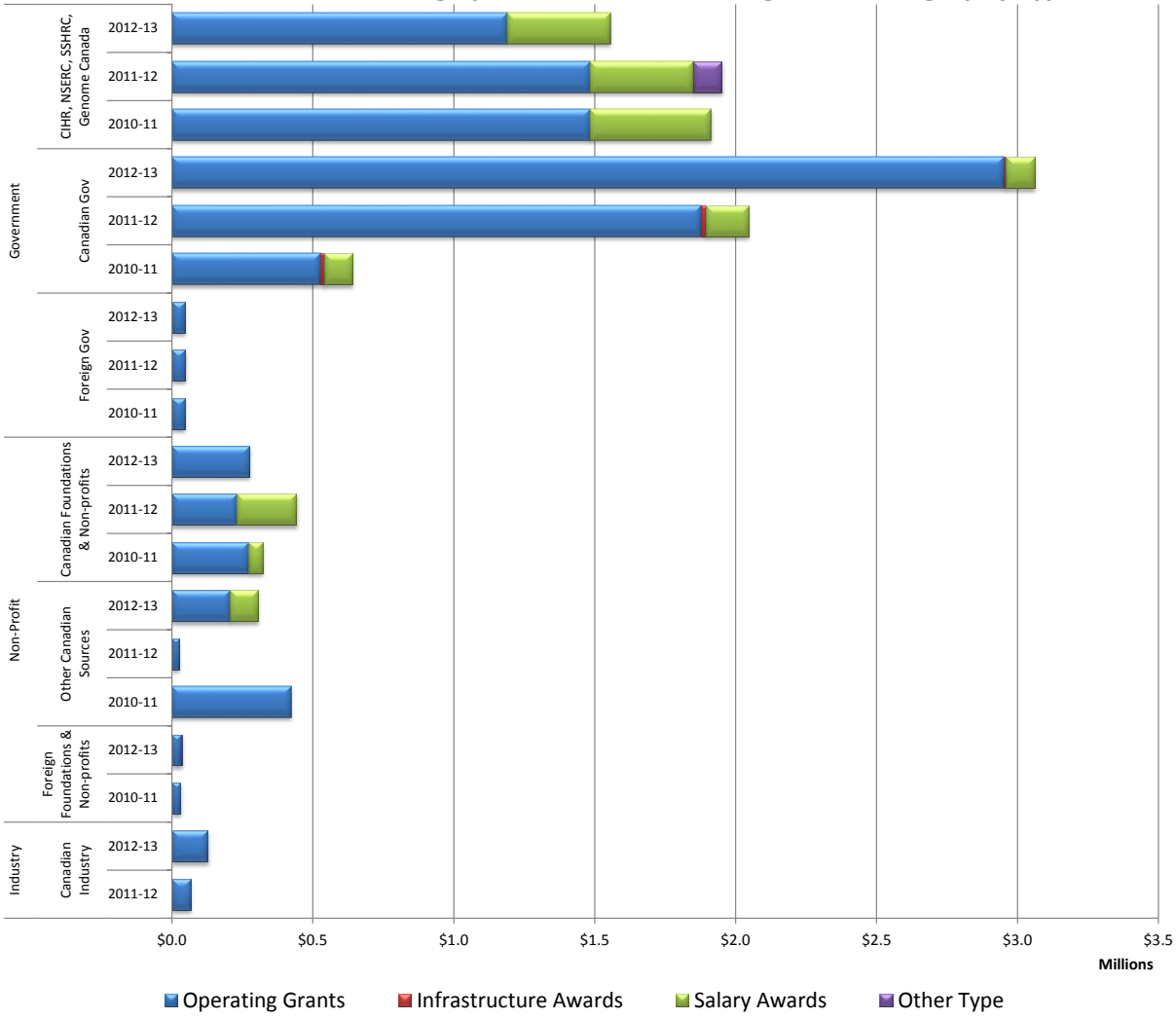
Figure 34

BCMHARI Research Funding by Funding Type and Sub-type



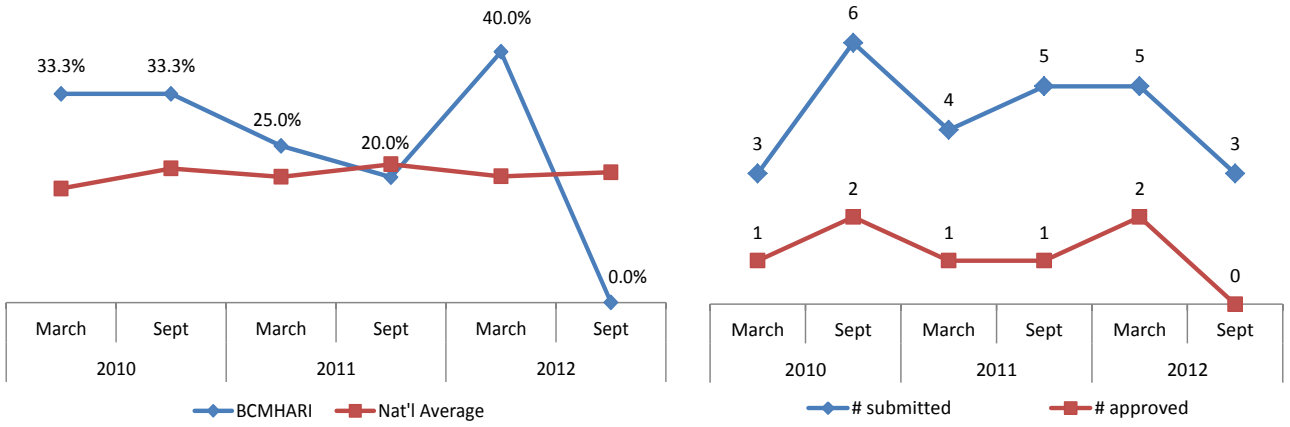
The top two funding categories are Canadian Government (57%) and Major Canadian Funding Entity (29%). Figure 35 details the major funding categories by RISe sector, funding source and funding type. A complete list of funding sources is detailed in Appendix 8.

Figure 35
Total BCMHARI Research Funding by RISe Sector and Funding Source Category by Type



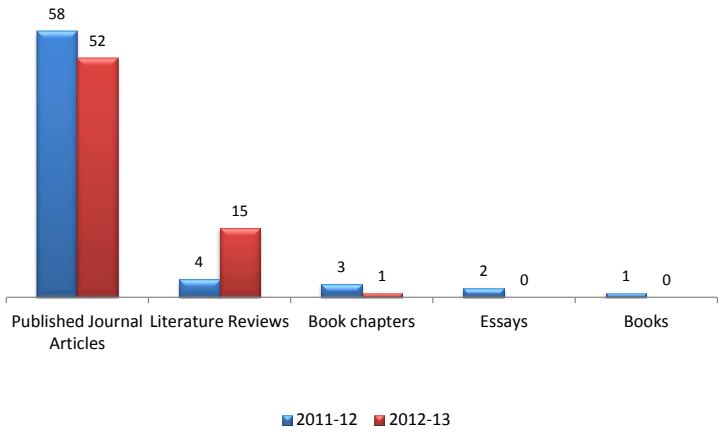
BCMHARI has demonstrated success in recent CIHR operating grant competitions, exceeding the national average in the March operating competition. Figure 36 below shows competition success rates and number of applications submitted and approved.

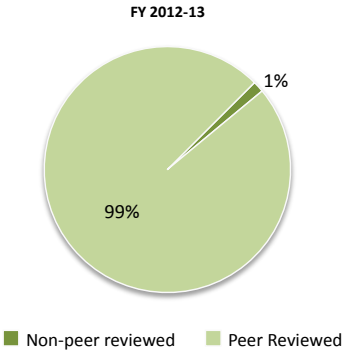
Figure 36
BCMHARI's CIHR Operating Grant Application Success Rate & Number of Applications Submitted/Approved



Total number of publications by type and category (peer vs. non-peer reviewed) is collected for a second year. Peer reviewed represents the gold standard for scientific credibility. BCMHARI is reporting 68 distinct publications in FY 2012-13; the same number reported in FY 2011-12. See Figure 37 for a breakdown by type and category. 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 37
Total Number of BMHARI Publications by Type and Category

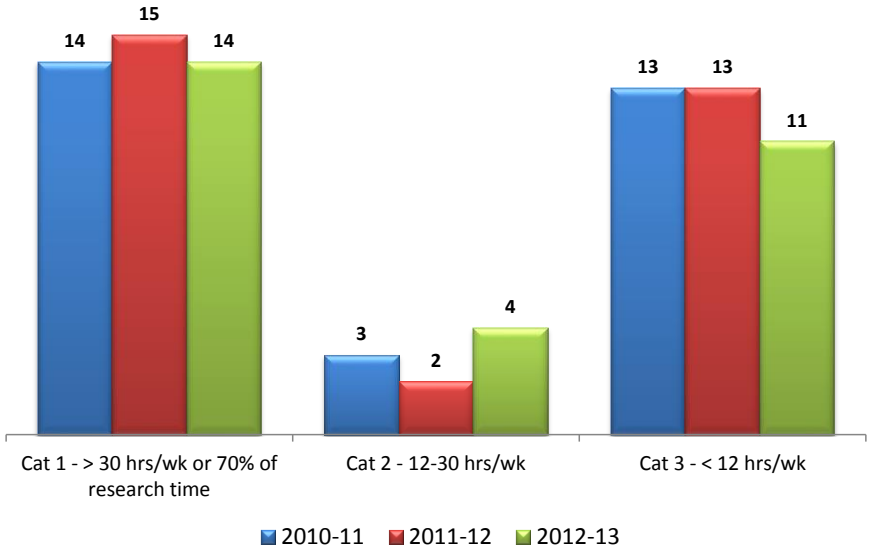




Building Research Capacity

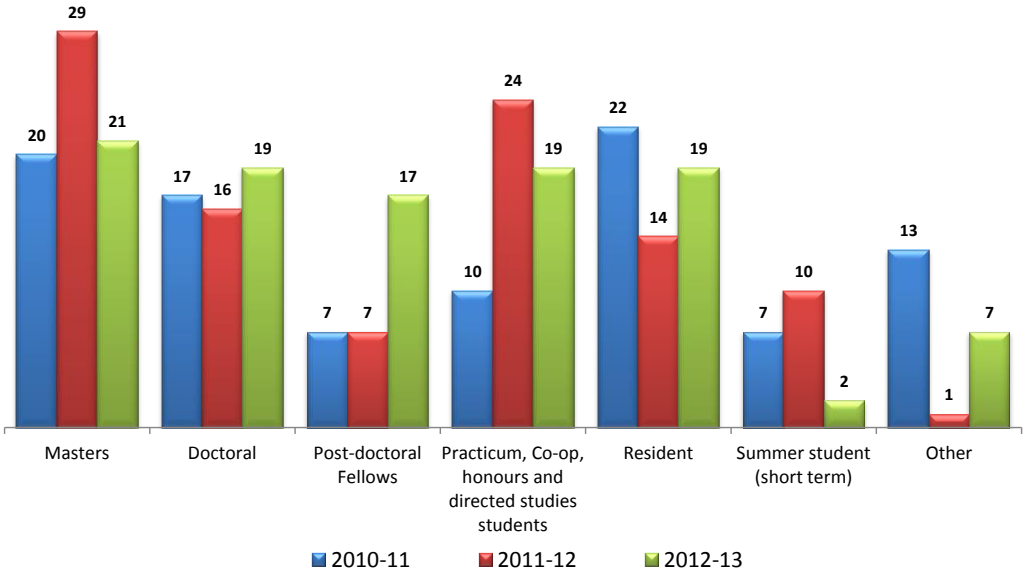
BCMHARI had a total of 29 researchers in FY 2012-13, with 14 having greater than 30 hours or 70% protected research time per week (Figure 38). BCMHARI continues to attract nationally and internationally recognized researchers to its research facility situated on the third floor of the Translational Research Building located on the Children's & Women's Health Centre of British Columbia (C&W) campus. BCMHARI 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 BCMHARI, many clinicians and front line staff also participate in research programs.

Figure 38
Total Number of BCMHARI Researchers by Category



During FY 2012-13, BCMHARI researchers provided training and supervision to a total of 104 trainees (up by 3 trainees from FY 2011-12). The largest increase was seen in the Post-doctoral category, from 7 in FY 2011-12 to 17 in FY 2012-13.

Figure 39
Total Number of BCMHARI Trainees by Category



Advancing Health and Policy Benefits

There were eight BCMHARI clinical trials active during FY 2012-13; over the course of the fiscal year, four of these clinical trials closed. Expected local subject enrolment (for the term of the four studies) was 195. (see Table 7).

Table 7
BCMHARI Clinical Trials

	10-11	11-12	12-13
Total Number of Clinical Trials active during the FY	4	2	8
Status of the Trial as of March 31 in the FY:			
Total Number of Active Trials	3	1	4
Total Number of Trials that closed during FY	1	1	4
Enrolment Numbers:			
Expected Local Subject Enrolment (for the term of the study)	395	195	195
Total Subject enrolment to March 31 in the FY	322	133	193
Total Subject enrolment during the period April 1 to March 31 during FY	67	12	48

Table 8 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2012-13 as a result of research driven by BCMHARI researchers, and their corresponding benefits. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 8

BCMHARI Outcomes Survey Responses

Please describe any guideline, drug, diagnostic agent or device adopted or approved in FY 2012-13 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.**
Four articles, in three languages, co-authored by a PHSA researcher, were published reviewing and explaining the rationale for Metacognitive training/therapy (MCT). Although antipsychotic medication has been the most widely used and efficacious treatment in ameliorating the symptoms of psychosis, there has been a growing realization that pharmacological treatment has limitations, which has led to development of novel non-pharmaceutical interventions. Metacognitive training/therapy (MCT) is a non-pharmaceutical intervention which has been shown to improve symptomatology and functioning in individuals with psychosis. It focuses on increasing the individuals understanding of the psychological mechanisms associated with delusions and hallucinations, and helping them develop strategies to improve reality testing and belief evaluation.	The increased uptake of MCT will improve patient quality of life through symptom reduction and will improve the quality of patient care by reducing medication side effects. Cost savings related to pharmaceutical use may also be realized.
PHSA researchers produced a report of receptor antagonism effects of antipsychotic medications on neuropsychological functioning in persons with first episode psychosis. The findings indicate that most of the cognitive impairment in patients with first episode psychosis is related to the illness, but another component is related to the characteristics of the antipsychotic medication prescribed.	Antipsychotic medications are a critical part of the treatment of first episode psychosis, and optimizing the specific medication to the cognitive signature of the illness may limit the side effects patients' experience.
PHSA researchers produced a report of the response profile and time course of symptom change in persons with schizophrenia treated with clozapine. Clozapine is an antipsychotic drug reserved for patients that have a poor response to other medications. To our surprise, the time course of clozapine response was similar to other antipsychotics, with the bulk of improvement in the first four weeks.	Since there are few alternatives for this group of patients, a longer trial of clozapine is likely necessary before determining if the patient will benefit from this unique medication.
Results were released of a 19 month long intervention studying the effects of a patient engagement program in a forensic psychiatric hospital. Although the study findings did not demonstrate an impact on outcomes, strengthening patient engagement was found to contribute towards an improved patient experience	Uptake of these findings can improve patient experiences in a traditionally challenging care setting (forensic psychiatric hospitals).
A PHSA researcher participated in a study designed to inform genetic counselling practices by exploring mother's perspectives of their child's mental illness compared to other complex disorders. The study findings have implications for genetic counsellors in terms of the psychosocial supports that are offered.	The uptake of these study findings has implications for genetic counsellors in their practice. There is an opportunity to improve the supports offered by genetic counsellors to families impacted by serious mental illness. Additionally, there is an opportunity to identify families who can benefit from genetic counselling related to mental illness regardless of whether this is their primary reason for referral.
PHSA researchers co-authored a report "Health Information Preference among Youth and Caregivers related to Second-Generation Antipsychotic Treatment" in the journal *Canadian Academy of Child and Adolescent Psychiatry*. The findings of this study support the inclusion of youth and caregivers in the development of educational resources related to medications.	The uptake of these report findings will improve the reach and applicability of health literacy strategies.

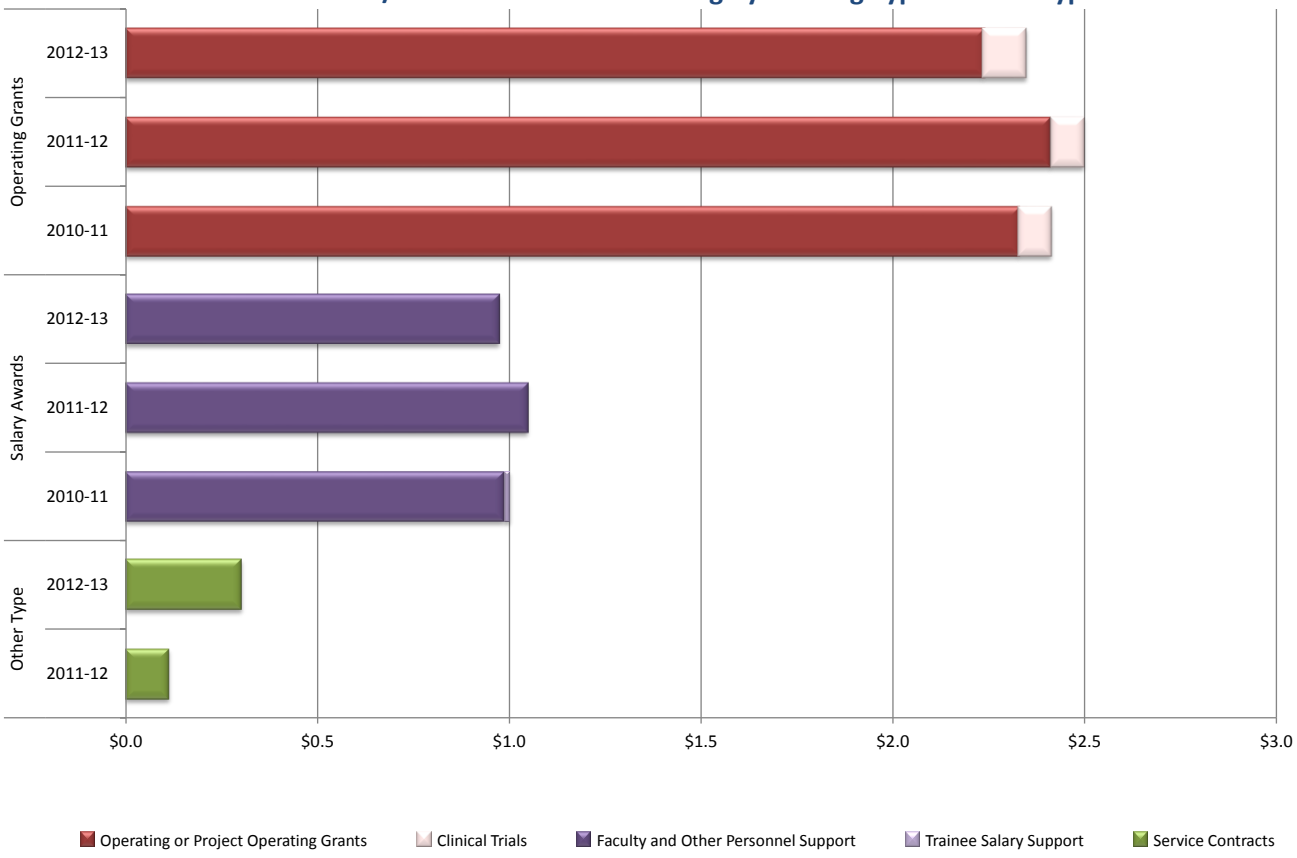
Please describe any guideline, drug, diagnostic agent or device adopted or approved in FY 2012-13 as a result of research driven by PHSA researchers.	**Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.**
PHSA researchers studied the implementation of a Metabolic Monitoring Training Program in a BC health authority and reported improved monitoring rates and a decrease in second generation antipsychotic prescriptions for the population studied.	The uptake of these report findings will improve the quality of patient care by reducing medication side effects. Cost savings related to pharmaceutical use will also be realized.
In 2011/12, BCMHARI reported the Short Term Assessment of Risk & Treatability (START) as a research outcome. START had been recognized as a leading practice by Accreditation Canada in 2011 and received an excellence in quality award from the BC Patient Safety & Quality Council in the category of "Living with Illness". In the 2012/13 fiscal year, the reliability and validity of the START was supported in *Psychological Assessment*, a journal focused on empirical research on measurement and evaluation related to clinical psychology.	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.
Building on the success of the Short Term Assessment of Risk & Treatability (START), a version of the tool for adolescent populations was developed (START:AV) and subsequently implemented in three juvenile correctional facilities in the United States as a pilot project.	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.
2012/13 saw the launch of a ½ day training program in Obsessive Compulsive Disorder (OCD) Cognitive Behavioural Therapy (CBT) for BC Children's Hospital and University of British Columbia psychology students. The training program was grounded in the research of and developed by a PHSA researcher.	There is an underrepresentation of CBT-trained treatment providers for OCD. This knowledge translation activity resulted in increased capacity for the BC health care system to provide empirically proven CBT for this patient population.
A PHSA researcher co-authored a report on the assessment and medication management of paediatric obsessive compulsive disorder (OCD). The report findings were further disseminated, and included in a chapter on paediatric OCD and obsessive-compulsive spectrum disorders in a book focused on OCD across the lifespan.	Uptake of these findings can improve community and hospital-based patient care for OCD, which is often under-diagnosed and characterized by subtherapeutic dosage levels.
The *Journal of the American Academy of Child and Adolescent Psychiatry* reported on rage in youth with OCD. The report drew attention to this common but underreported problem in this population.	Uptake of this report will result in decreased misdiagnosis of OCD comorbidities among youth.
Release of results from two large genome wide association studies indicating enrichment of top gene findings with brain tissue.	These results represent the largest global studies to date in search for OCD and Tourette Syndrome vulnerability genes, which when identified, can be used to develop new treatment approaches.

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

Producing and Advancing Knowledge

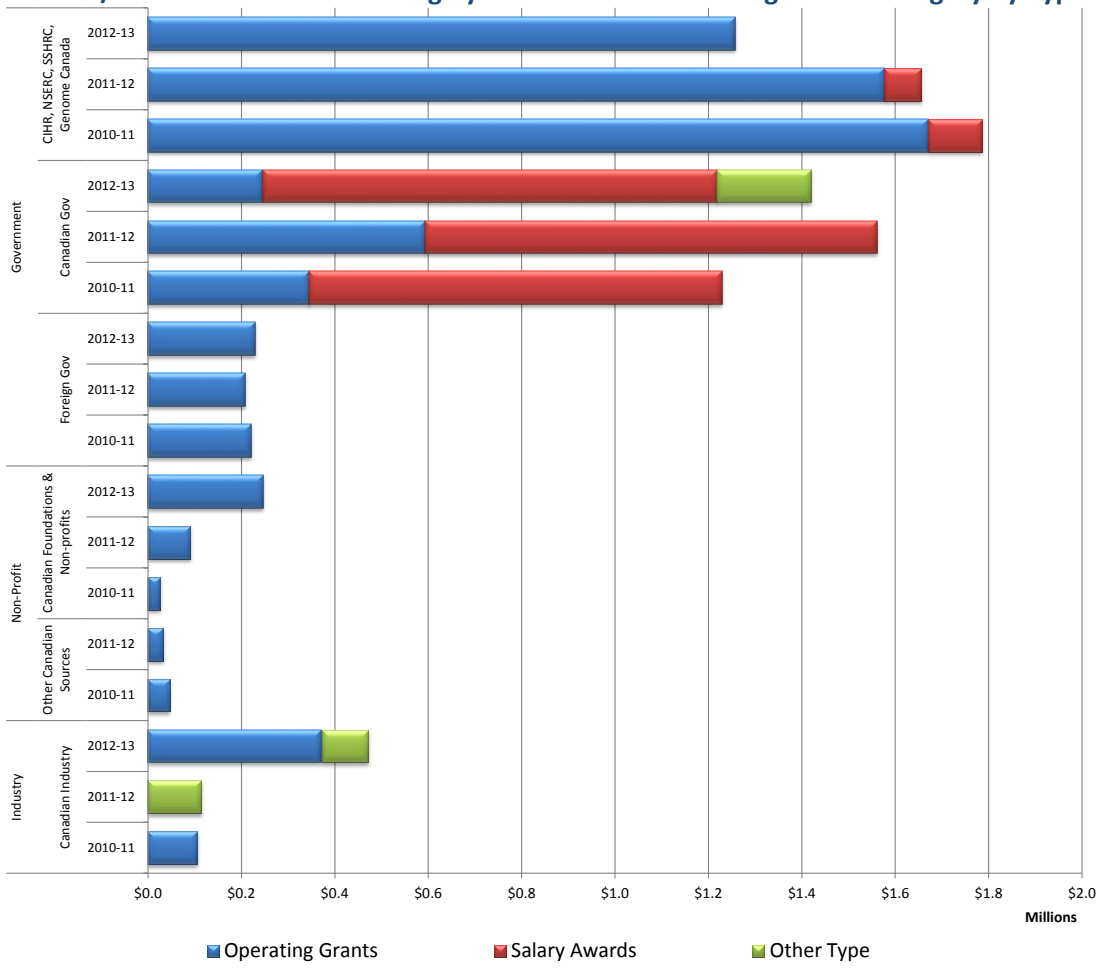
In FY 2012-13, researchers affiliated with BCCDC/UBC CDC were awarded a total of $3,622,736 in research funding. The amount awarded as Operating Grants ($2,348,499) makes up 65% of total awards. A breakdown of funding types and subtypes can be found in Figure 40. BCCDC's portion of the Indirect Costs Program grant totaled $190,168 for FY 2012-13 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 40
Total BCCDC/UBC CDC Research Funding by Funding Type and Sub-type



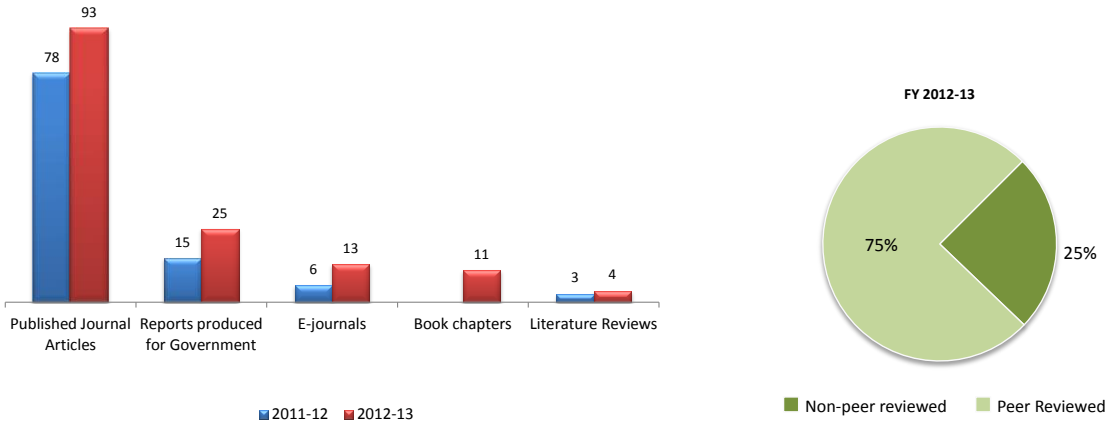
The top two funding categories are Canadian Government (39%) and Major Canadian Funding Entity (35%). Figure 41 details the RISe sector and major funding categories by funding type. A complete list of funding sources is detailed in Appendix 9.

Figure 41
Total BCCDC/UBC CDC Research Funding by RISe Sector and Funding Source Category by Type



Total number of publications by type and category (peer vs. non-peer reviewed) is collected for a second year. Peer review represents the gold standard for scientific credibility. See Figure 42 for a breakdown by type and category. 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 42
Total Number of BCCDC/UBC Publications by Type and Category

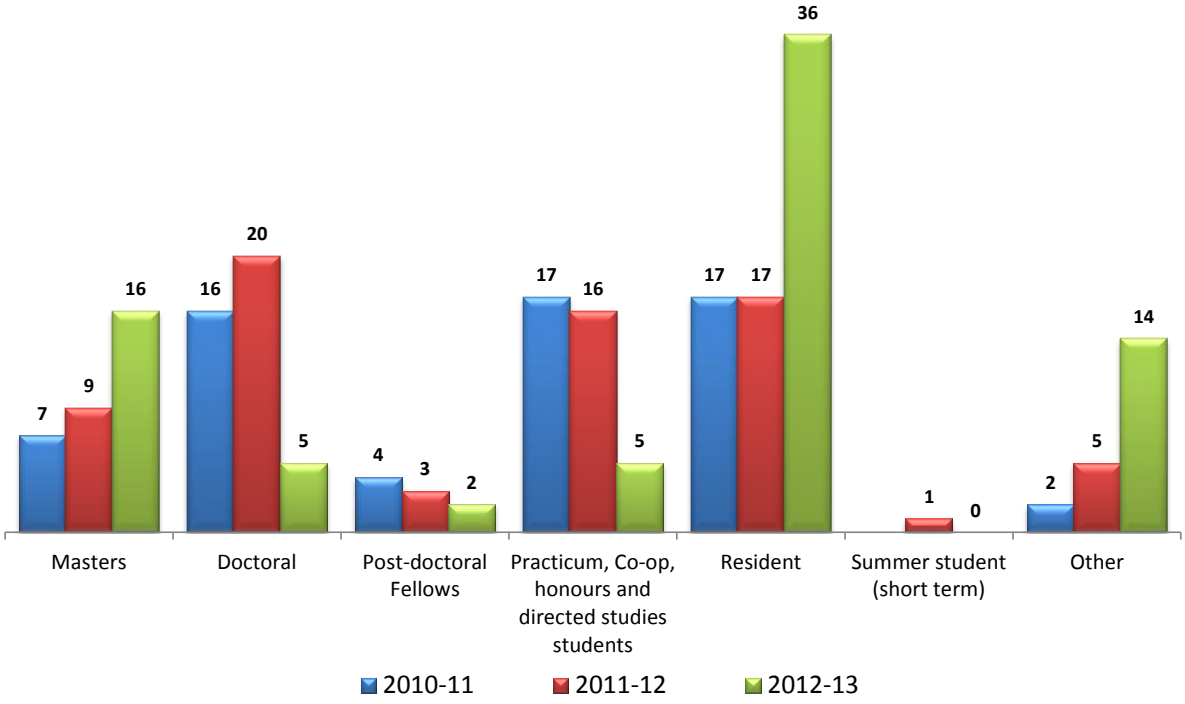


Building Research Capacity

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 32 researchers meeting this definition in FY 2012-13.

During FY 2012-13, BCCDC/UBC CDC researchers provided training and supervision to a total of 78 (up 7 from FY 2011-12) trainees (see Figure 43). The largest increase is seen in the resident and other categories.

Figure 43
Total Number of BCCDC/UBC CDC Trainees by Type



Achieving Economic Benefits and Innovation

For FY 2012-13 BCCDC had three (3) Provisional Patent Applications (related to the Chlamydia vaccine), and three (3) National Patents filed.

Advancing Health and Policy Benefits

Table 9 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2012-13 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 9
BCCDC/UBC CDC Outcomes Survey Responses

Guideline, drug, diagnostic agent or device adopted or approved in 2010/11 as a result of research driven by PHSA researchers	**Benefits to patients, population health, and/or health system sustainability of the items identified**
Antigenic proteins in Chlamydia trachomatis that engender protective immune responses were identified using genomic and proteomic techniques by PHSA/UBC CDC researchers and commercialized by PREVENT, a nonprofit NGO dedicated to vaccine development. The subunit vaccine was recently identified by WHO as suitable for expedited human trials.	Chlamydia trachomatis is the most common reported communicable infection in BC with over 12,000 infections detected last year alone. Untreated infection is an important cause of infertility in women. A seek and treat infection control program was launched in BC over 20 years ago but has not reduced spread of the infection. Annually the Chlamydia control program costs the BC heath care system nearly $10,000,000. A vaccine is the most cost effective solution.
In November 2012, the Provincial Communicable Disease Policy Committee approved a program to offer anonymous HIV testing, based in part on an original analysis of survey data demonstrating that gay men with concerns about privacy are delaying getting tested in BC.	Reduces barriers to HIV testing for individuals with privacy concerns that impedes testing
The Influenza and Emerging Respiratory Pathogens team of the BC Centre for Disease Control published 17 papers during the 2012-2013 period, several of which had immediate impact on response to influenza and other emerging or re-emerging respiratory pathogens and prevention/control programs.	Benefits include: 1. Real-time measure of 2012-2013 influenza vaccine effectiveness, published in expedited fashion as interim estimates in an open access peer-reviewed journal and leading to recommendations for adjunct control measures in Canada and abroad. 2. Analysis of the number needed to vaccinate (NNV) associated with the proposed "cocoon immunization" approach for prevention of pertussis in infants, underscoring the inefficiency of this approach and leading to the emphasis of other control measures during recognized outbreaks in BC, Canada and elsewhere. These findings were published in the peer-reviewed journal Clinical Infectious Diseases. 3. Sero-survey to assess population susceptibility to the emerging swine-origin influenza A/H3N2v strain, applying these findings further in a contact network model to inform pandemic potential of that virus in BC and Canada. These findings directly informed risk assessment in Canada and further indicated that current vaccine components do not induce serologic response to the emerging swine-origin H3N2v and also thereby contributed to discussions about swine worker vaccine recommendations through the National Advisory Committee on Immunization. 4. Findings from our team also contributed to the World Health Organization's meta-analysis of pandemic H1N1 attack rates as well as to publication of a meta-analysis in the Lancet reporting influenza vaccine effectiveness. Our team also contributed to publications related to the largest measles outbreak in Canada in a decade (in Quebec) highlighting increased risk of measles infection with earlier first of two-dose immunization in infancy - a finding with substantial implications for the Canadian goal of measles elimination. All of the above have been published in international peer-reviewed journals.

Guideline, drug, diagnostic agent or device adopted or approved in 2010/11 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
The Do Bugs Need Drugs Program (BCCDC) distributed the updated Bugs and Drugs antibiotic treatment guidelines to all physicians, medical trainees, residents, pharmacies and to allied health professionals with a role in prescribing. The guidelines were developed by Blondel-Hill (IHA, formerly of PHSA) and Fryters (Alberta Health Services) with collaborators throughout the PHSA.	Improved guidance on antibiotic use will reduce unnecessary prescribing. A measurable reduction in unnecessary antibiotic prescribing can reduce the pressure for selection of antibiotic resistant organisms and reduce costs. Less selection of resistant organisms means that we may see a more sustained benefit from antibiotic therapy in our population.
The genomic epidemiology approach to outbreak investigation, pioneered by BCCDC researchers in 2010/11, was adopted by the USFDA and CDC as a tool for foodborne illness outbreak investigation and was included as a line item in the 2014 US federal budget.	This demonstrates the important impact this technique is having on international public health practice, with other jurisdictions following our lead in using genomics as a tool for investigating disease transmission.
2012-13: A provincial Hepatitis C guideline was developed based on evidence and leading practices for the Communicable Disease Control Manual. This guideline was developed in order to meet the needs of BC health professionals who follow-up individuals who have been newly identified with hepatitis C virus (HCV) infection.	This document provides public health personnel with a guide for standardized follow-up of newly identified hepatitis C cases that is flexible to the needs of the Regional Health Authorities and the communities they serve. Follow-up may occur directly with a client or indirectly through a liaison who is already engaged with the client.
The BC Public Health Microbiology Reference Laboratory Team at the BCCDC Site, co-lead by Dr. J. Isaac-Renton and Dr. P. Tang with Project Lead, Dr. Natalie Prystajecky, was successful in obtaining a Genome Canada/Genome BC grant and a Canadian Water Network grant for total of $3.5 Million. The purpose of the project overall is to apply metagenomics and genomics to fresh water sources for drinking, to identify and assess new water pollution assessments bio-markers and to develop better pipelines for introducing molecular methods into laboratories. The assembled Team from across Canada includes molecular microbiologists, environmental microbiologists, public health workers, social scientists and bio-informatics experts. This Team was one of three passing 'without" report in its Genome Canada/Genome BC Interim External Review; its international Scientific Advisory Board are laudatory regarding work to date.	We have developed new methods for assessing the health of watersheds and engaged stakeholders to improve methods for protecting our natural sources of water.
We have conducted a multi-centre national review of antibiotic resistance and use surveillance.	The report will inform a revised national focus on antibiotic resistance at the Public Health Agency of Canada.
Developed Clinical Guidelines for Interferon Gamma Release Assay Testing for the Diagnosis of Latent Tuberculosis Infection (LTBI).	These guidelines help target resources toward those who would benefit most from LTBI treatment.

Women's Health Research Institute (WHRI)

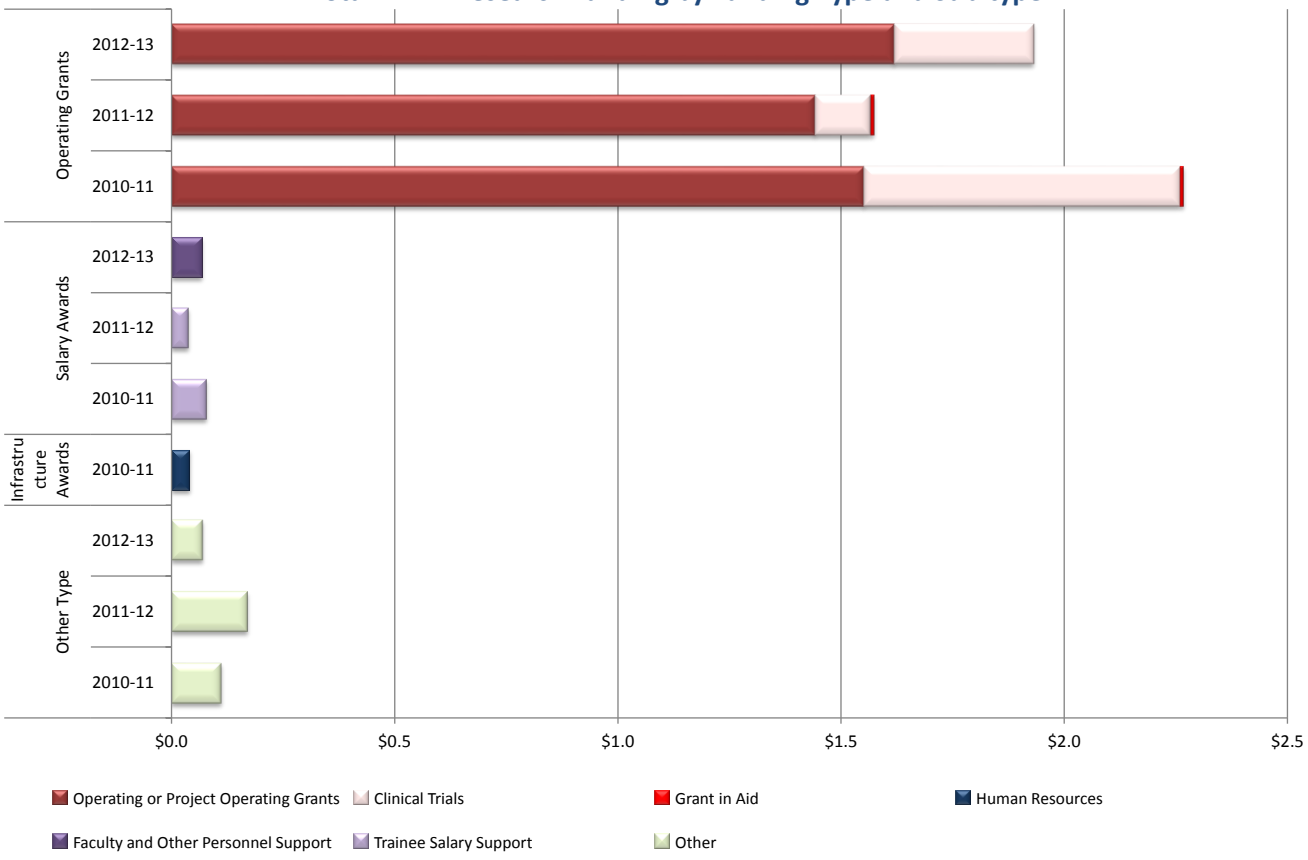
Producing and Advancing Knowledge

WHRI was created in 2005 by the BC Ministry of Health and the PHSA with a mandate to build and develop women's health research for the PHSA and for British Columbia. The WHRI is unique as the focus is on nimble response to clinically driven research questions. It provides broad-based support to member researchers.

In FY 2012-13, researchers affiliated with WHRI were awarded a total of $2,069,213 in research funding, which represents a 14% increase over last year. The amount awarded as Operating Grants ($1,932,042) makes up 93% of total awards. A breakdown of funding types and subtypes can be found in Figure 44. WHRI's portion of the Indirect Costs Program grant totaled $85,543 for FY 2012-13 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.

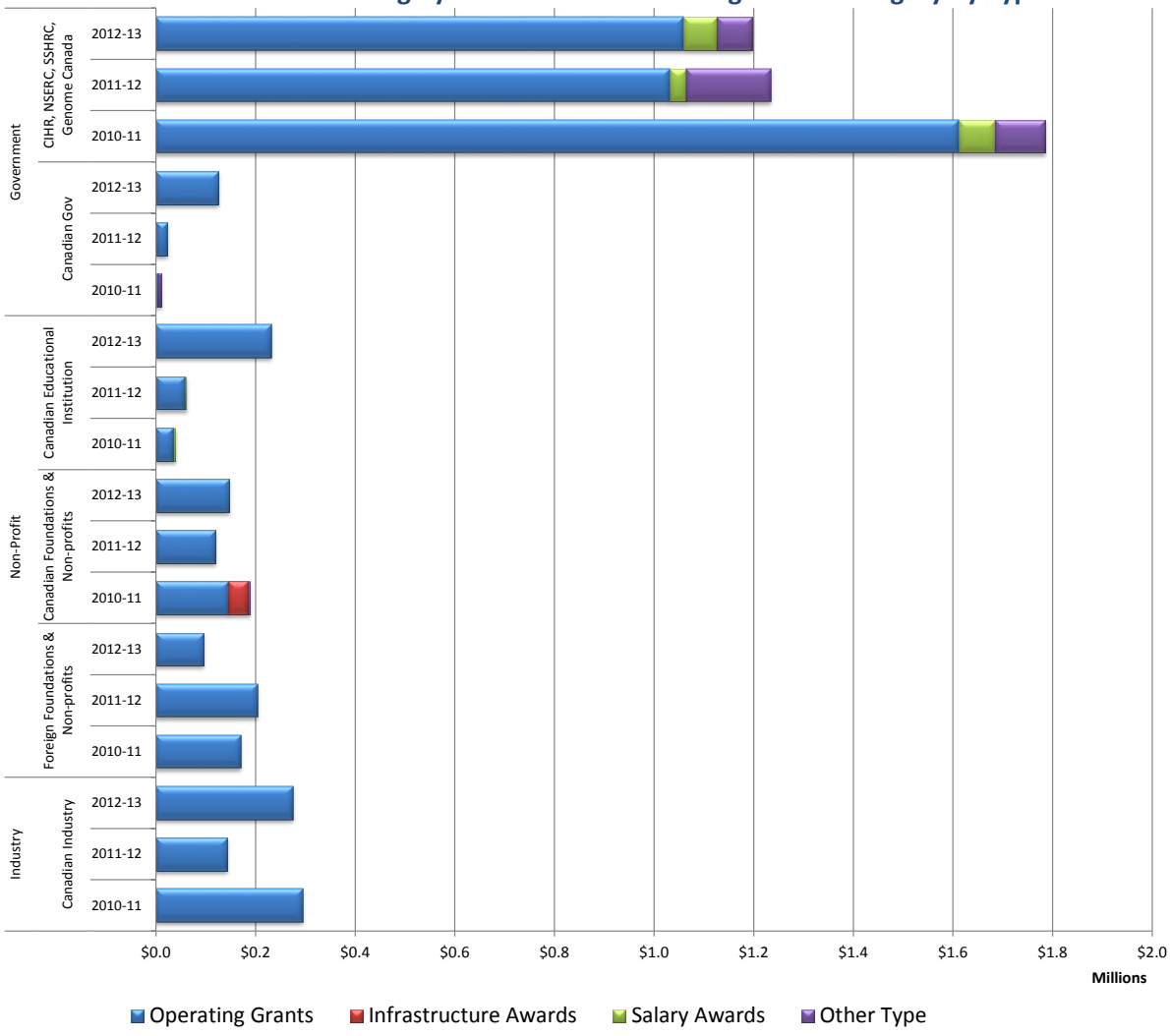
Figure 44

Total WHRI Research Funding by Funding Type and Sub-type



In FY 2012-13, the top two funding categories are Major Canadian Funding Entity (58%) and Canadian Industry (13%). Figure 45 details the major funding categories by funding type. A complete list of funding sources is detailed in Appendix 10.

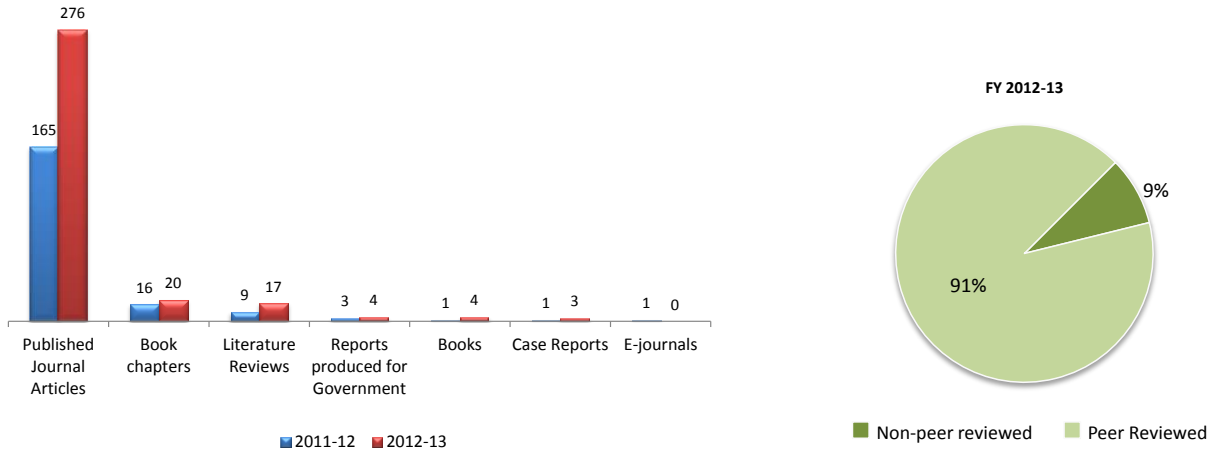
Figure 45
Total WHRI Research Funding by RISe Sector and Funding Source Category by Type



WHRI had one application submitted in the March CIHR operating grant competition. 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.

Total number of publications by type and category (peer vs. non-peer reviewed) is collected for a second year. Peer review represents the gold standard for scientific credibility. See Figure 46 for a breakdown by type and category. 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.

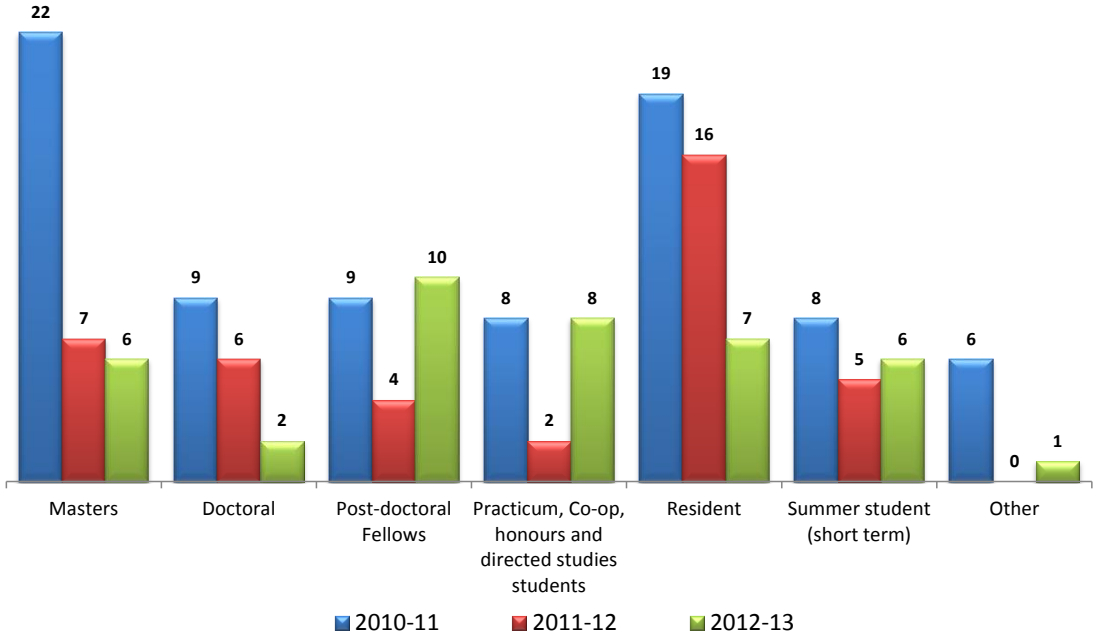
Figure 46
Total Number of WHRI Publications by Type and Category



Building Research Capacity

In FY 2012-13, WHRI researchers provided training and supervision to a total of 40 trainees, the same as last FY. The total number of trainees for FY 2011-12 has been restated to include only those who are WHRI members and primary supervisors of the trainees (see Figure 47).

Figure 47
Total Number of WHRI Trainees by Type



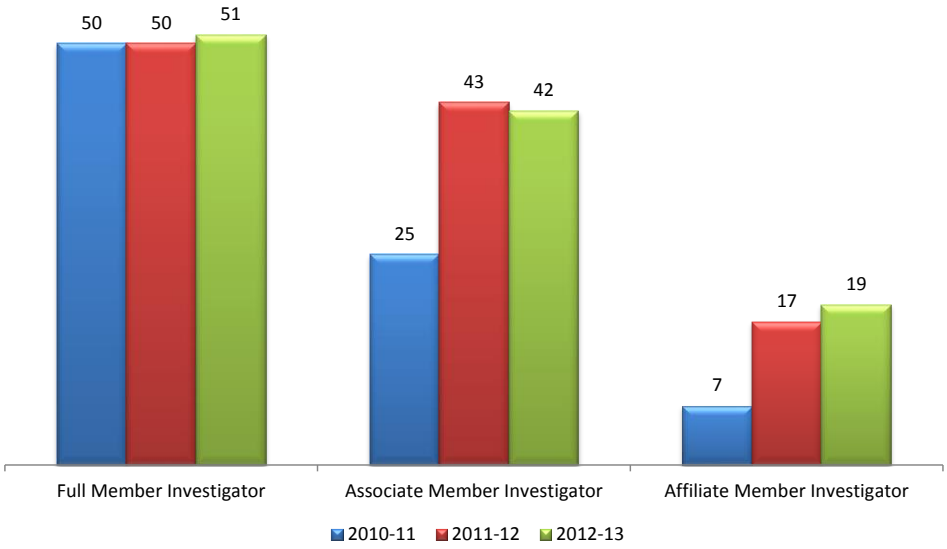
In an effort to show WHRI's activities, their membership statistics are shown (see Figure 48). In FY 2012-13, the number of members remained stable in all categories. The membership categories are as follows:

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 48
Total WHRI Membership by Category



Advancing Health and Policy Benefits

The challenge in reporting clinical trial information is that there is no central mechanism to capture information about active clinical trials on the C&W site. For the purposes of this report, data are based on RISe database files that answered "yes" to question 7.11 (a) (Registration for Publication of Clinical Trials) on an application form. Research Coordinators and Managers (PIs, when necessary) were then contacted to obtain enrolment numbers. The majority of clinical trials are likely included in these data (thanks to the network of coordinators/managers recently put in place) but it is possible that some trials have been missed (see Table 10).

Table 10
WHRI Clinical Trials

	10-11	11-12	12-13
Total Number of Clinical Trials active during FY	25	22	26
Status of the Trial as of March 31 in the FY:			
Total Number of Active Trials	18	20	26
Total Number of Trials that closed during FY	7	2	0
Enrolment Numbers:			
Expected Local Subject Enrolment (for the term of the study)	1,981	2,582	2,609
Total Subject enrolment to March 31 in FY	1,171	2,098	2,073
Total Subject enrolment during the period April 1 to March 31 in the FY	916	1,319	309

Table 11 reflects a sample of key guidelines, drugs, diagnostic agents, or devices adopted or approved in FY 2012-13 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 11
WHRI Outcomes

Guideline, drug, diagnostic agent, or device adopted or approved in FY 2012-13 as a result of research driven by PHSA researchers	**Benefits to patients, population health, and/or health system sustainability of the items identified**
WHRI researchers participated in policy change removing restrictions on contraceptive devices for women and girls with First Nations and Inuit status.	Improved health care sustainability due to increased access to more cost effective contraception methods, that have also been shown to be more effective at preventing unintended pregnancies and associated high rates of abortion and high-risk pregnancies.
Hospital-based guideline revised to remove the requirement for family physicians to obtain a consult from an obstetrician above an arbitrary cut-off of oxytocin augmentation during delivery.	Patient outcomes improved through streamlining of processes and shorter time to delivery, cost savings to the health care system through increased efficiencies.
Dissemination of knowledge translation materials on the Optimal Birth BC website, which were developed based on 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.
Implementation of infant stool color cards to screen for biliary atresia in newborns as a result of research supported by CFRI/WHRI.	Improved patient outcomes through early intervention and prevention of liver failure due to biliary atresia. Reduced costs to the health care system due to cheap screening methodology (visual comparison of infant stool colour to colour reference cards) and prevention of complications and adverse outcomes.
WHRI researchers validated best clinical practice specifically in the context of pregnancy: ultrasonographic testing and Doppler imaging are reliable methods of ruling out blood clots in the legs of pregnant women, and therefore, physicians can feel confident in safely withholding anticoagulation therapy based on imaging results.	Pregnancy is associated with high rates of blood clots and potentially life threatening complications; blood thinners (anticoagulants) are used to treat blood clots, but can also be associated with high rates of complications. Appropriate use of diagnostic tools (ultrasound and Doppler imaging) to tailor therapy and the choice to use blood thinners will decrease costs to the health care system and improve patient outcomes.
National clinical guideline published: The Diagnostic and Statistical Manual – Version 5 (The ultimate reference guide for psychiatric diagnosis)	Improved mental health outcomes with updated diagnostic criteria to better reflect patient experiences and allow for more nuanced treatment.
WHRI researcher assisted in the drafting of the national clinical guideline: Canadian HIV pregnancy planning guidelines.	Improved maternal and child patient outcomes, including reduction of horizontal and vertical transmission of HIV, and increased access to pregnancy planning and fertility services.
National clinical guideline published: Emergency Contraception.	Decreased costs to the health care system and improved patient outcomes due to prevention of unintended pregnancies through increased awareness and use of emergency contraception.
WHRI/CFRI researcher was one of principal authors for national clinical guideline published: Current Status in Non-Invasive Prenatal Detection of Down Syndrome, Trisomy 18, and Trisomy 13 Using Cell-Free DNA in Maternal Plasma.	Cost savings in limiting the use of novel technology to situations of maximal benefit to patient outcomes.
WHRI and BCCA researchers participated in clinical practice gynaecology committee that led to the development of the national clinical guideline: Surgical Safety Checklist in Obstetrics and Gynaecology.	Improvement in patient outcomes: patient safety, decrease in complications and mortality.

Guideline, drug, diagnostic agent, or device adopted or approved in FY 2012-13 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
WHRI and BCCDC researchers participated in the development of national clinical guideline: Antibiotic Prophylaxis in Gynaecologic Procedures.	Cost savings when antibiotic use is unnecessary, as well as avoidance of associated harms to patient. Conversely, when antibiotic use is appropriate, patient outcomes are improved, e.g. decreased infection and complication rates.
WHRI and BCCDC researchers participated in the development of national clinical guideline: Toxoplasmosis in Pregnancy: Prevention, Screening, and Treatment.	Improved patient outcomes, both maternal and fetal, including avoidance of unnecessary procedures with associated risks and prevention of fetal infection where possible.

Registries & Datasets

Advancing Health and Policy Benefits

Data stewards for a total of thirteen PHSA registries or data sets, were invited to participate in a survey designed to assess registry/dataset purpose, access statistics, nature of research activities, and research benefits. Of the 13 Registries, 4 did not respond to the survey this fiscal year (BC Cardiac Registry, PROMIS – Transplant, PROMIS – Renal, and PICNET). 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 is 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 purpose

The Primary Purpose of each registry/dataset is listed below. For those registries that completed the survey last year, the primary purpose has not changed.

Registry/Dataset	Primary Purpose
BC Cancer Registry	Monitoring the Burden of Disease.
BC Cardiac Registry	Provides information for monitoring, planning and evaluation.
BC Perinatal Database Registry	The Registry is used to evaluate outcomes, care processes and resources through partnerships and collaboration in building a high quality system of care across the continuum. This ultimately leads to the optimizing of pregnancies and birth outcomes as a foundation for a healthy population.
BC Trauma Registry	To support the impact of the quality of care of the trauma patient.
Central Transfusion Registry	Blood/Patient Safety (Lookback, Traceback as per the Krever Commission) and Blood and Blood product utilization.
Cervical Cancer Screening Database	Clinical System for cervical cancer screening program patient as well as a lab system for all gynaecological cytology performed by the Provincial lab
PREDICT	Acts as a source of information for research involving BCCA patients.
PROMIS -Transplant	Monitors program effectiveness. Supports patient care.
PROMIS-BC Renal Agency	Clinical, administrative and research management of chronic kidney disease.
Screening Mammography Database	Clinical system for scheduling, reporting and tracking of screening mammography exams.
Surgical Patient Registry	Assists in the management of waitlists.
Tumour Tissue Repository	Acts as a source of information for research.

When asked to describe additional uses of the datasets, data stewards also consistently identified the following top two key purposes:

- a source of information for research
- for future planning and to plan program(s)

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 datasets above are categorized in Figure 49. Access requests are summarized in Figure 50. For examples of the types of research questions posed by researchers using the above data sets, please see Appendix 1.

Figure 49
Breakout of Predominant Nature of Research Questions Using Data from the Registries or Datasets

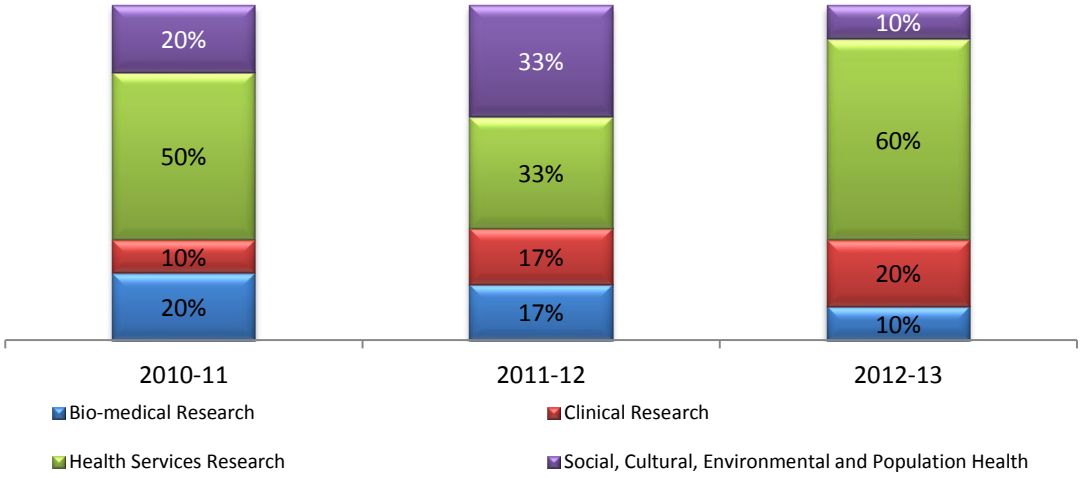
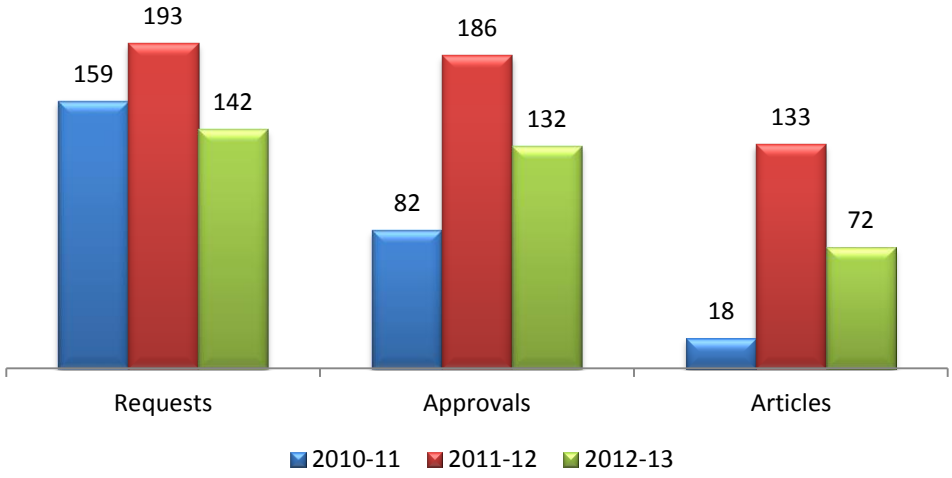


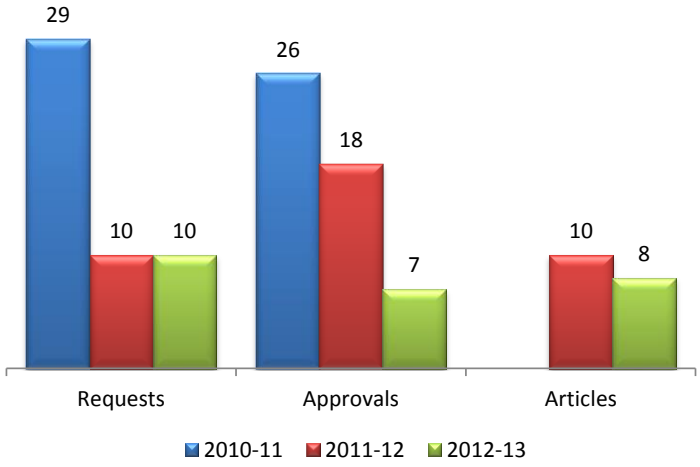
Figure 50
Research Requests and Approvals from Registry Research Resources by Fiscal Year



In addition to the below Registries, BC Emergency Health Services, 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 result are 4 distinct data sets; Cardiac Clinical Trials, Trauma Clinical Trials, Cardiac Arrest Registry and Trauma Registry. See Figure 51 for FY 2012-13 access requests statistics for these data sets. BC Emergency Health Services is mainly a health service delivery agency whose mandate includes the production of knowledge in the patient populations they serve.

Figure 51

Total number of ROC Research Requests/Approvals and Published Articles



Research Benefits

The total number of scholarly articles that were published during FY 2012-13 that resulted from, or reported on, access to data from PHSA registries or datasets was 72. The reliability of this data is in question as survey responses were often incomplete. A sample of patient and/or system benefits that were quantified, identified, or attained in FY 2012-13 that resulted from research based on the registry or dataset is excerpted below.

BC Perinatal Database Registry (Perinatal Health Program)	• One study looked at early term elective repeat cesarean in BC. We have found that this practice was common across a wide range of maternal, care provider, and institutional characteristics, suggesting that most obstetrical care settings would benefit from quality-improvement programs to reduce elective repeat cesarean deliveries before 39 weeks. This research informed the selection of an indicator for early elective repeat CS before 39 weeks as one of the 5 indicators which will be publicly reported and shared with the Health Authorities planned for the Fall of 2013. • Another study found that the increases in pregnancy terminations were responsible for the increases observed in stillbirth rates and were associated with declines in the prevalence of congenital anomalies among live-born infants. Further work will continue to study how the current system of stillbirth registration can be improved to better track stillbirths that are not related to pregnancy termination.
PREDICT	• PREDICT has engaged over 1000 patients attending the BCCA Vancouver Island center in research during the reporting period. Between April 1, 2012 and March 31, 2013 PREDICT approached 1364 patients (43% of all new patients), of whom 1295 (95%) chose to participate and provide permission to be contacted for research in the future and a blood sample. • PREDICT has facilitated staff involvement in training x3 research interns in the reporting period who have then chosen to apply for and obtained positions for higher training in health disciplines (occupational therapy and medical school). • PREDICT continues to serve as the prototype model for training and development of other similar platforms across BCCA and PHSA and other health centers in BC including the successful launch of the program at the BCCA SAHCSI center in Kelowna.

BC Trauma Registry	• For the purposes of improving patient care registry data from both the Trauma and Burn registries have been used to support quality initiatives within the programs by looking at trends and themes in areas such as complications, performance indicators, informing systems from pre-hospital to inpatient care, as well as monitoring and assessing the trauma patients within regions.
BC Cancer Registry	• Many of the projects that use the registry data or clinical data captured by Data Quality and Registry attempt to assess patient outcomes for BC patients treated under certain protocols (Outcomes research). I am aware of a number of these projects now that are being reviewed by journals that have a question related to the safety of treating patients according to a specific radiotherapy protocol used in BC and assessing long-term patient outcomes. The studies are showing that the care delivery used in BC is safe from a long-term patient outcome point of view. • I am aware of two other projects using our data that are examining questions related to staging of certain populations of patients and whether current staging systems correctly characterize the risk for certain cancers by examining subgroups of patients and their outcomes (both are being reviewed by journals and have been presented at international oncology meetings). These types of studies have the potential to create discussions on appropriate staging guidelines for patients and have a potential to impact direct patient care).
BC Transfusion Registry	• Provincial IVIg Rheumatology Screening program - cost avoidance for BC (net $6.6 million since 2009/10 implementation). • CSTM (Canadian Society of Transfusion Medicine) conference poster presentations - 3 posters accepted in FY 12/13 and being presented this week in Edmonton, Alberta.
BCEHS/ROC	• We utilize this database as part of our cardiac arrest data collection towards the reporting of EMS response times and patients survival to hospital discharge rate.

Appendix 1 - Example Research Questions by Registry/Dataset

Tumour Tissue Repository	• What are the prognostic subtypes of triple negative breast cancer? • What are the mechanisms of lung cancer development in never smokers? • Are bacterial organisms associated with risk of colorectal cancer? • Can colon cancer susceptibility genes be identified to improve screening for colorectal cancers? • What are the clinical outcomes of genetic changes seen in neuroendocrine tumours of the small bowel and lung? • How can tumour permeability to immune cells enhance immunotherapies for cancer? • How does the tumour environment influence estrogen receptor regulation in breast cancer?
BC Perinatal Database Registry (Perinatal Health Program)	• A comparison of the neonatal and maternal outcomes following mid-pelvic instrumental vaginal delivery and cesarean delivery • Teratogenicity associated with the use of antiepileptic medications in utero in British Columbia • Psychotropic drug use in pregnancy: Patterns of use and neonatal and infant outcomes
PREDICT	• What are the gaps in care experienced by BCCA patients? • Can small RNA species in plasma be used as an early lung cancer detection tool? • What is the prevalence of PD-L1 in serum of patients with pancreatic cancer?
Surgical Patient Registry	• What are the surgical waits for prostate cancer patients, by Health Authority, including distance to nearest surgical facility and wait for specialized treatment modality? • What are the different treatment practices for prostate cancer patients, e.g. radiation, surgery, and brachytherapy? • What is the volume of blood used for all surgical cases - both adults and pediatrics - for a five year period, by Health Authority and surgeon specialty?
BC Cancer Registry	• Impact on clinical outcomes of time from diagnosis to time of curative-intent chemotherapy in Hodgkin Lymphoma • Exploring bottlenecks in the diagnostic and treatment pathway for vulnerable populations in Northern British Columbia • An examination of body weight, diet, and physical activity information needs to inform service provision for rural breast cancer survivors in Northern British Columbia • Population-based validation of improved overall survival with docetaxel chemotherapy from time of first palliative radiotherapy in men with prostate cancer in British Columbia • HRV Biofeedback for Psychological Distress in Survivors of Primary Brain Tumour • Risk of brain cancer from exposure to radio frequency fields from wireless telecommunication devices in childhood adolescence (Mobi-Kids) • Survival Outcomes in Patients with Lymphoma by Location of Residence and Cancer Care • British Columbia Metis Health and Well-Being: Metis cancer incidence and experiences with the BC Cancer Agency • CONCORD-2 Study: Global Surveillance of Cancer Survival. This is an international study comparing cancer survival for more than 10 cancers across 200+ cancer registries around the world. • International Incidence of Childhood Cancer Study, vol III. This is an international study led by the WHO examining incidence patterns of cancers in children around the world.
BC Trauma Registry	• Rate of Pulmonary Embolism in Trauma Patients • Benefits of laparoscopic washout following splenic artery embolization in blunt abdominal trauma patients • Operative vs. non-Operative Management of Flail Chest • Assessment and management of neuropathic pain in patients with burn injury - a retrospective chart audit • The Early Development Instrument (EDI): Translating School Readiness Assessments into Injury Prevention • Neuropathic Pain Treatment Guidelines and SCI • Pressure Ulcer Prevention Guidelines and SCI • Canadian Burn Epidemiology Study • Incidence of Venous Thromboembolism in Burn Patients Receiving Chemoprophylaxis • Nosocomial Infections and Burn Patients
Screening Mammography	• Do General Practitioner letters improve screening mammography participation rates? • Cumulative breast Density and breast cancer incidence • Use the Gail model to determine if the 5 year cancer detection rate for the subpopulation of women in the SMPBC with high risk will have a higher cancer detection rate than the average lower risk female population.

Cervical Cancer Screening Program	• Cost of Cervical Cancer Treatment in British Columbia • Childhood/Adolescent/Young Adult Cancer Survivor Research Program
BC Transfusion Registry	• Which surgical specialties used blood and blood products? • Is there a provincial or regional variability in blood use within and between surgical specialties? • Which surgical specialties utilize the most RBC's and could be targeted for education? • How have RBC utilization practices in surgical sub specialties changed over time? • What blood utilization trends in surgery in BC can be identified to forecast future demand? • How will the aging population impact future transfusion utilization rates in surgery in BC?
BCEHS/ROC	• Which method of CPR (30:2 or continuous compressions) will result in a greater percentage of patients surviving to hospital? • In VF/VT arrest, where a patient has received one or more shocks, is survival to hospital discharge improved with early therapeutic administration of amiodarone compared to placebo.

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 including ARIF (average relative impact factor)
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*

Julie Wei
Manager, Quality Analytics, BC Emergency Health Services

Ellen Chesney
Chief Administrative Officer - Research, PHSA

Ognjenka Djurdjev
Corporate Director, Performance Measurement & Reporting, PHSA

Nur Eisma
UBC/C&W Coordinator Pre & Post Awards

Kristy Kerr, BSc, MPH-HP
Associate Director, Development and Research Promotion
BCCDC Foundation for Population and Public Health

Catriona Hippman MSc, CGC
Senior Research Manager, Women's Health Research Institute (WHRI)

Karin Jackson
Director, Research Administration & Performance Improvement
BC Mental Health & Addiction Services

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

Bonnie Barrett
Executive Assistant, Research & Education Services, Child & Family Research Institute

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

Beth Palacios
Consultant, Performance Measurement & Reporting, PHSA

Priscilla Vuong
Research Development Unit Manager, BC/UBC Centre for Disease Control

Sameera Wazir
Manager, Office of Research Services, UBC

*As of September, 2013

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, BCMHARI 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, 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).

Glossary

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)	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 definitions from FY 2010-11 forward. **Definitions:** **Gross licensing revenue** = Royalties + Equity Liquidated + Option Fees + License Fees + License Management + Technology Assignment; **Net Licensing revenue** = (above – expenses for patenting, legal & related costs) * distribution % per distribution arrangement The net revenue distribution varies by entity and will be noted in the narrative. **Royalty, equity liquidated and licensee fees** 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. **Option Fees** 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. **Technology Assignment** 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.
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

Glossary

Term	Description
	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 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)

Glossary

Term	Description
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.
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.

Glossary

Term	Description
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, 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.
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 Masters 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)

Glossary

Term	Description
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).
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).
OTHER	
Fiscal Year 08-09 Fiscal Year 09-10 Fiscal Year 10-11 Fiscal Year 11-12 Fiscal Year 12-13	April 1, 2008 – March 31, 2009 April 1, 2009 – March 31, 2010 April 1, 2010 – March 31, 2011 April 1, 2011 – March 31, 2012 April 1, 2012 – March 31, 2013