PHSA Research Metrics

3rd Annual Report

Fiscal Year 2010-11

Prepared For: PHSA Research Committee
Prepared by: Ellen Chesney, Chief Administrative Officer - Research
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 1). 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.

Table of Contents

Table of Contents 3
PHSA Research Metrics Fiscal Year Summary – PHSA Overall 5
Executive Summary 6
PHSA Aggregate Analysis 8
- Producing and Advancing Knowledge 8
  - Total PHSA Research Funding, including Major CFI Grants by Funding Type and Sub-Type 8
  - Total PHSA Research Funding With/Without Major CFI Grants 9
  - Total PHSA Research Funding without Major CFI Grants by Fiscal Year and Type 9
  - Percentage of PHSA Research Funding, including Major CFI grants by Funding Source Category by FY 10
  - PHSA CIHR Application Success Rate 11
  - Total Number of Publications by Agency 11
- Building Research Capacity 12
  - Total Number of PHSA Researchers by Category and Agency 12
  - Total Number of PHSA Researchers by Category 13
  - Total Number of PHSA Trainees by Fiscal Year 13
  - Total Number of PHSA Trainees by Type by Fiscal Year 14
- Achieving Economic Benefits and Innovation 14
  - Total # of Invention Disclosures, Provisional Patent and PCT Applications Filed by Fiscal Year 15
  - Total # of National Provisional Patent Applications Filed by Fiscal Year 15
  - License/Assignment Agreements (left) and Spin-Off Companies (right) by Fiscal Year 15
- Advancing Health and Policy Benefits 16
  - Total # of Clinical Trials and Total Subject Enrollment by Fiscal Year 16

BC Cancer Agency (BCCA) 17
- Producing and Advancing Knowledge 17
  - Total BCCA Research Funding including Major CFI grants by Funding Type and Sub-type 17
  - Total BCCA Research Funding Totals With/Without Major CFI Grants 18
  - BCCA Research Funding, including Major CFI grants by Funding Source Category and Type 19
  - BCCA's CIHR Operating Grant Application Success Rate 20
- Building Research Capacity 20
  - Total Number of BCCA Researchers by Category and Fiscal Year 20
  - Total Number of BCCA Trainees by Type and Fiscal Year 21
- Achieving Economic Benefits and Innovation 21
  - BCCA TDO Invention Disclosures, Provisional Patent and PCT Applications by Fiscal Year 21
  - BCCA TDO National Patent Activity by Fiscal Year 22
  - BCCA License Agreements (left) and Spin-Off Companies (right) by Fiscal Year 22
  - TDO IP Related Revenue for FY 2010-11 23
- Advancing Health and Policy Benefits 23
  - BCCA Clinical Trials 23
  - BCCA Outcome Survey Responses 24

Child & Family Research Institute (CFRI) 25
- Producing and Advancing Knowledge 25
  - Total CFRI Research Funding including Major CFI grants by Funding Type and Sub-type 25
  - Total CFRI Research Funding Totals With/Without Major CFI Grants 26
  - CFRI Research Funding, including Major CFI grants by Funding Source Category and Type 27
  - CFRI's CIHR Operating Grant Application Success Rate 28
- Building Research Capacity 28
  - Total Number of CFRI Researchers by Category 29
  - Total Number of CFRI Trainees by Type 30
- Achieving Economic Benefits and Innovation 30
  - CFRI Invention Disclosures, Provisional Patent and PCT Applications Filed by Fiscal Year 30
  - CFRI National Patent Activity by Fiscal Year 31

CFRI License/Assignment Agreements (left) and Spin-off Companies (right) by Fiscal Year 32
CFRI IP Related Revenue for FY 2010-11 32
Advancing Health and Policy Benefits 32
CFRI Clinical Trials 33
CFRI Outcomes Survey Responses 34
BC Mental Health and Addictions Research Institute (BCMHARI) 35
Producing and Advancing Knowledge 35
BCMHARI Research Funding by Funding Type and Sub-type 35
Total BCMHARI Research Funding by Funding Source and Type 36
BCMHARI's CIHR Operating Grant Application Success Rate 37
Building Research Capacity 37
Total Number of BCMHARI Researchers by Category 38
Total Number of BCMHARI Trainees by Category 38
Advancing Health and Policy Benefits 38
BCMHARI Clinical Trials 39
BCMHARI Outcomes Survey Responses 39
BC Centre for Disease Control/UBC Centre for Disease Control (BCCDC/UBC CDC) 41
Producing and Advancing Knowledge 41
Total BCCDC/UBC CDC Research Funding by Funding Type and Sub-type 41
Total BCCDC/UBC CDC Research Funding by Funding Source and Type 42
Building Research Capacity 43
Total Number of BCCDC/UBC CDC Trainees by Type 43
Advancing Health and Policy Benefits 43
BCCDC/UBC CDC Outcomes Survey Responses 44
Women's Health Research Institute (WHRI) 47
Producing and Advancing Knowledge 47
Total WHRI Research Funding by Funding Type and Sub-type 47
Total WHRI Research Funding by Funding Source and Type 48
Building Research Capacity 49
Total Number of WHRI Trainees by Type 49
Total WHRI Membership by Category 50
Advancing Health and Policy Benefits 50
WHRI Clinical Trials 50
WHRI Outcomes 51
Registries & Datasets 52
Advancing Health and Policy Benefits 52
Breakout of Predominant Nature of Research Questions Using Data from the Registries or Datasets 54
Research Requests and Approvals from Registry Research Resources by Fiscal Year 54
Appendix 1 - Framework for PHSA Research Metrics 56
Appendix 2 - Research Metrics Working Group Membership* 57
Appendix 3 - Glossary 58

PHSA Research Metrics Fiscal Year Summary – PHSA Overall

Indicator		Key Measure Description	FY 2008-09 Value	FY 2009-10 Value	FY 2010-11 Value
Producing & Advancing Knowledge	1a	**Total Annual Grant Awards by Type (excluding Major* CFI Infrastructure grants)**	**96,387,301**	**114,975,373**	**127,823,436**
		Salary Awards	11,613,680	12,773,593	13,169,936
		Infrastructure Awards – HR & Minor CFI	5,451,742	7,670,729	8,353,900
		Operating Grants	74,625,991	90,062,320	99,851,648
		Other	4,695,888	4,468,731	6,447,951
		Total Annual Grant Awards including Major CFI Infrastructure grants (see 2d below)	**96,387,301**	**151,677,259**	**138,721,931**
	1b	**Total Annual Grant Awards by Major Funding Source (excluding Major* CFI infrastructure grants)**			
		Major Canadian Funding Entity	50,616,290	57,305,640	49,656,972
		Other Canadian Sources	32,139,570	41,383,666	54,496,024
		Other Foreign Sources	13,630,501	16,286,067	23,670,439
	1c	Annual Grant Application Success Rate – CIHR March Competition – PHSA Overall/Nat'l Rate	N/A	27.7%/21.7%	21.0%/18.2%
	1c	Annual Grant Application Success Rate – CIHR Sept Competition – PHSA Overall/Nat'l Rate	N/A	41.3%/18.3%	26.8%/21.4%
	1d	Total # of Publications with Agency Author			
		CFRI			563
		BCCA			353
		WHRI	N/A	N/A	154
		BCCDC			90
		BCMHARI			80
		BCAS			4
Building Research Capacity	2a	Total # of Research Trainees	833	948	1,147
	2c	Total # of Researchers	463	526	633
	2d	Infrastructure Investment – Major CFI Infrastructure Grants	N/A	36,701,886	10,898,496
Achieving Economic Benefits & Innovation (BCCA & CFRI only)	3a	# of Invention disclosures	37	51	46
		# of Provisional Patent applications filed	18	30	25
		# of PCT applications filed	8	8	7
		# of Patents Filed/Issued	9/4	3/2	45/6
	3b	# Active License Agreements	20	101	101
		# of Spin-off Companies	4	7	7
		IP related revenue (net licensing revenue) – Future reporting for PHSA Overall	N/A	N/A	N/A
Advancing Health & Policy Benefits	4a	**Clinical Trials**			
		# active trials as of FY close	N/A	122	372
		Total Subject Enrollment		2,016	11,089
	4b,c,d	**Registries as Research Resources**			
		# of Research Requests/Approvals	167/41	159/119	159/83
		# of scholarly articles published	120	49	18

*see definition of Major CFI grants in Glossary – Appendix 3

Executive Summary

This is the third annual Research Metrics Report, based on the Framework for PHSA Research Metrics previously approved by the PHSA Research Committee (see appendix 1). All previously reported qualitative and quantitative metrics have been updated to include data for FY 2010-11 in the Framework's four categories; Producing & Advancing Knowledge, Building Research Capacity, Achieving Economic Benefits & Innovation, and Advancing Health & Policy Benefits. In addition, this year saw the introduction of one new metric; Total Number of Publications in the category of Producing & Advancing Knowledge. This is an important metric in that it recognizes the excellence of peer-reviewed, current research efforts, some of which are in the area of basic/discovery research and which are important for priming the pipeline of discovery to generate future translational research.

Given the scope of collected data, three-year results for each metric are provided, for the first time, 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, British Columbia Ambulance Services (BCAS). Given its relatively low level of research activity, BCAS 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, annual external grant awards, numbers of researchers, and number of research trainees, have all increased from 2009-10 levels. Application success rate has remained above the National Average. Total Annual Grant Awards, without Major CFI (Canada Foundation for Innovation) grants, increased by $12,848,063 to a three-year high of $127,823,436. Major CFI Infrastructure grants (see definition in the glossary) are reported separately under research capacity, indicator 2d, because these large-scale infrastructure grants 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.

While the total number of CIHR applications for the March and September operating competitions (indicators 1c) decreased from 39 to 29, PHSA's success rates have again, surpassed the national rates for both competitions. 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.

In addition, initial reporting of Indicator 1d, Total number of Publications, has been achieved in this year's report. This includes books, book chapters, peer-reviewed publications inclusive of published journal articles, case reports, essays, literature reviews, and e-journals. It excludes abstracts, editorials, summaries, letters to the Editor, epubs, in press and submitted publications. 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 second 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 BCMHARI. Data across PHSA agencies for disclosures, PCT and Provisional Patent applications remained relatively stable, while the number of National Patent Applications issued and filed, saw increases. Work was done this year to create a consistent approach to capturing IP related revenue in accordance with UBC criteria. Upon data collection, comparisons cannot accurately be made across research entities, but agency specific data are presented in each agency/institute's section and further work to provide consistency for next year is underway.

For Indicator 4: Advancing Health and Policy Benefits, a survey was issued for a second year, asking respondents to identify any guideline, drug, diagnostic agent or device adopted or approved in 2010/11 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, resulting data highlight some of the key products resulting from PHSA research that are improving outcomes and system sustainability. For a third year, a sample of patient and system benefits that were quantified, identified or attained in FY 2010-11 that resulted from research based on a registry or data set is also provided. For datasets and registries, a decline from FY 09-10 levels is seen for the # of research

requests/approvals, and number of scholarly articles published as a result of research utilizing PHSA Databases and Registries. This is due to lower survey response rate and cannot be accurately trended from previous years.

In addition, Indicator 4 information related to clinical trial activity shows an increase in both the number of active trials (from 122 to 372) and in total subject enrollment (from 2,016 to 11,089). 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.

As a follow-up to this report, outcomes that help "tell the story" of how research is advancing health will again be reported separately in a web-based outcomes report.

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 3) that guided data collection.

The following report was prepared with the assistance of a working group comprising representatives of each of the PHSA research entities and PHSA Performance Measurement and Reporting (see Appendix 2). The individuals within this group worked extremely hard to develop consistent definitions and approaches to collecting data which has served to further strengthen the consistency and clarity of the collected metrics and their efforts are greatly appreciated. It is recognized that the ability to report on all metrics included in the PHSA's research metrics framework is an iterative process and metrics will be refined further in future reports.

PHSA Aggregate Analysis

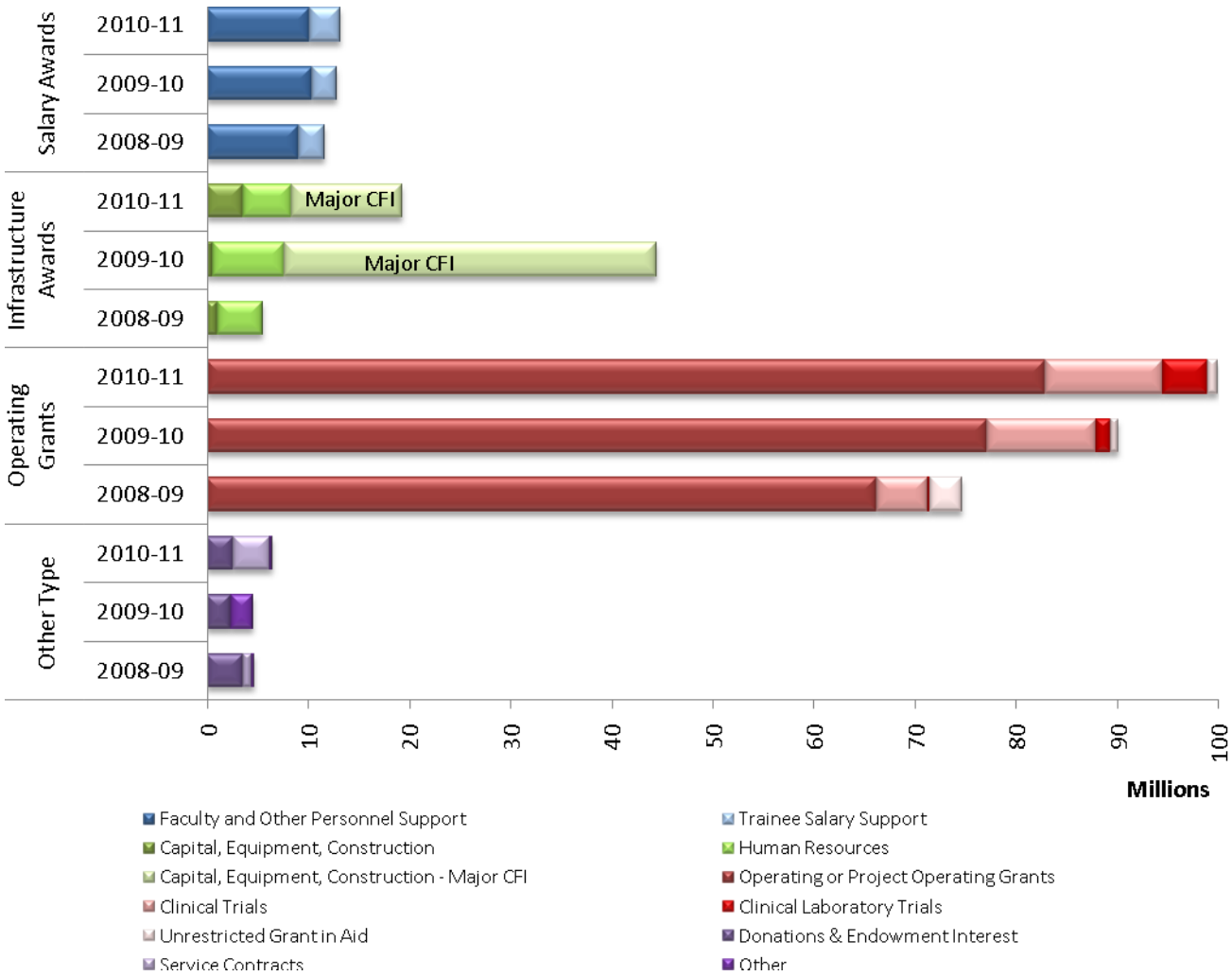
Producing and Advancing Knowledge

In FY 20010/11, researchers affiliated with PHSA were awarded a total of $138,721,932 including major CFI infrastructure grants. Operating Grants ($99,851,648) continued to make up the largest portion (72%) of total funding received. Operating grants support specific, time-limited research projects. While operating grants are the "bread and butter" of research grants, salary awards are important to provide researchers with the protected time to successfully compete for operating grants; salary awards have experienced a small but steady increase from FY 2008/09 – FY 2010/11.

A breakdown of funding types and subtypes by fiscal year can be found in Figure 1. As seen in all three years, the sub-types of Operating or Project Operating Grants, Faculty and Other Personnel Support, and Capital, Equipment and Construction continue to garner the largest portion of research funding [in their type categories of Operating Grants, Salary Awards and Infrastructure Awards respectively]. The large increase in Clinical Trials funding, from FY 2008-09 – FY 2010-11 going from approximately 5.0 million to 11.6 million is a reflection of better reporting and was under-reported in FY08-09. The Other Type category is comprised of mostly Service Contracts and Donations & Endowment Interest (see glossary for definitions).

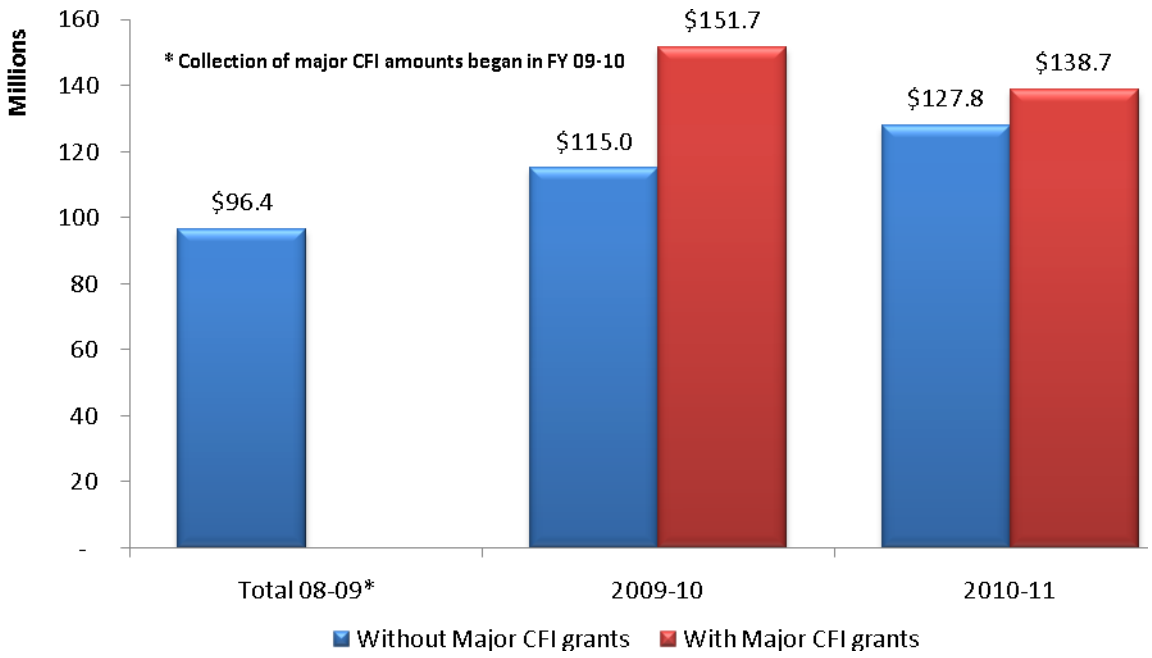
Figure 1

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



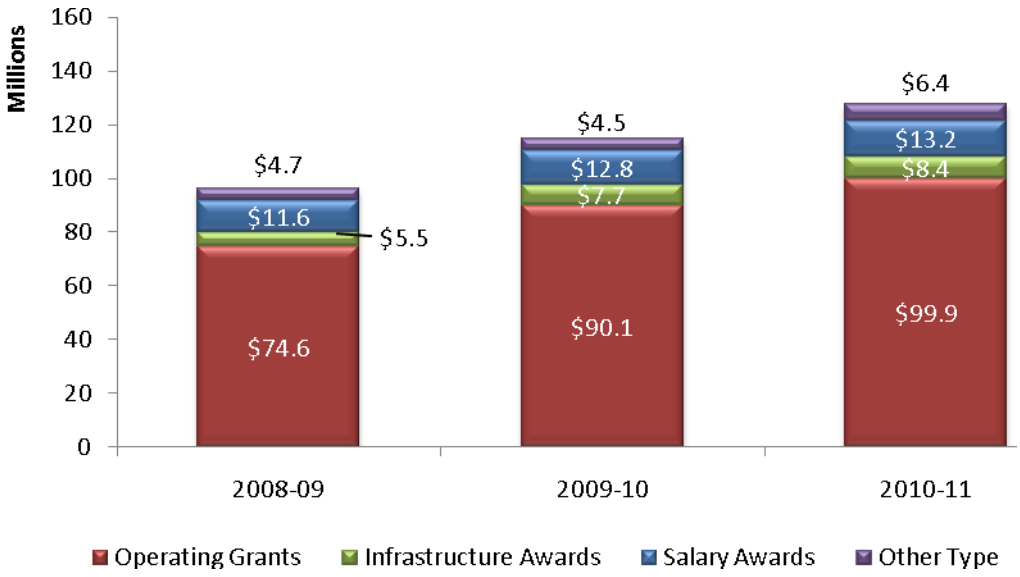
Total Funding, excluding major CFI infrastructure grants ($127,823,436), increased by 11.2% or $12,848,063. Total infrastructure grants decreased $25,803,339 compared to FY 2009/10 due to the fact that large-scale CFI infrastructure grants are not offered every year, are multi-year in duration, and full grant amounts are recorded in the year budgets are established. 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 is shown in Figure 3. This clearly shows an increase across all award types.

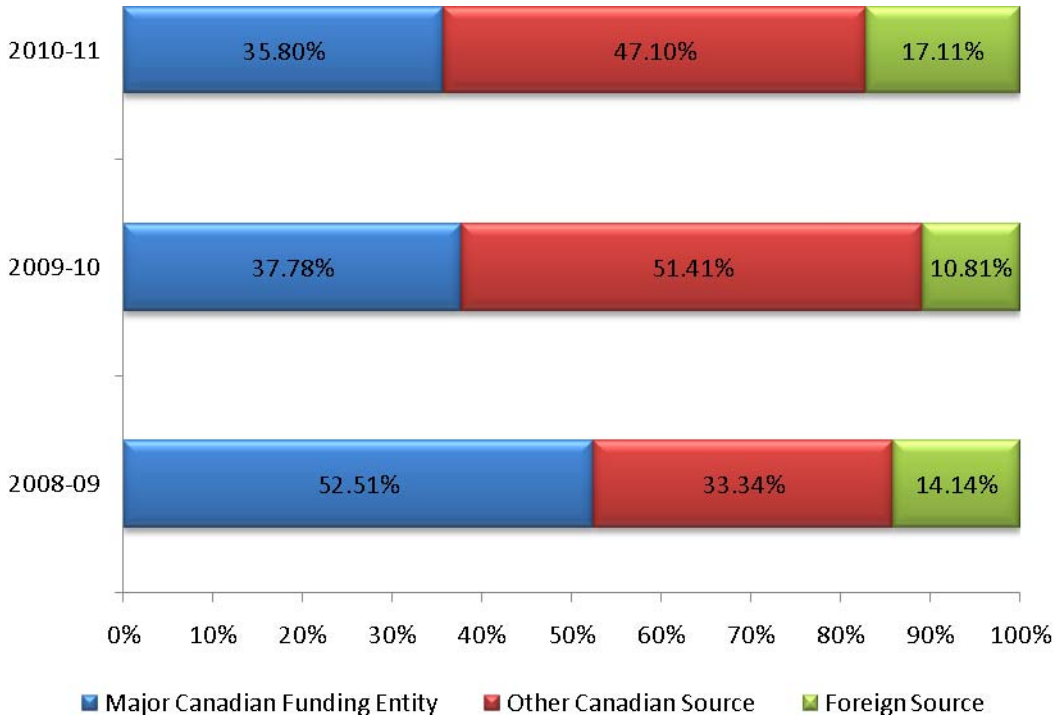
Figure 3
Total PHSA Research Funding without Major CFI Grants by Fiscal Year and Type



A comparison of total funding source by source category 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. This data includes Major CFI grants. Of note is the continued decrease (13.3%) in total funding from the Major Canadian Funding Entities. Major Canadian Funding entities include CIHR, NSERC, SSHRC, MSFHR, and Genome Canada & Agencies. This category had dropped from a high of 52.2% of total Funding in FY 08-09 to 35.8% in FY 2010-11. The decrease in this fiscal year is mostly due to a reduction in funding from Genome Canada/BC (57.4% decrease) and MSFHR (43.9% decrease). Funding source categories are detailed in Appendix 4.

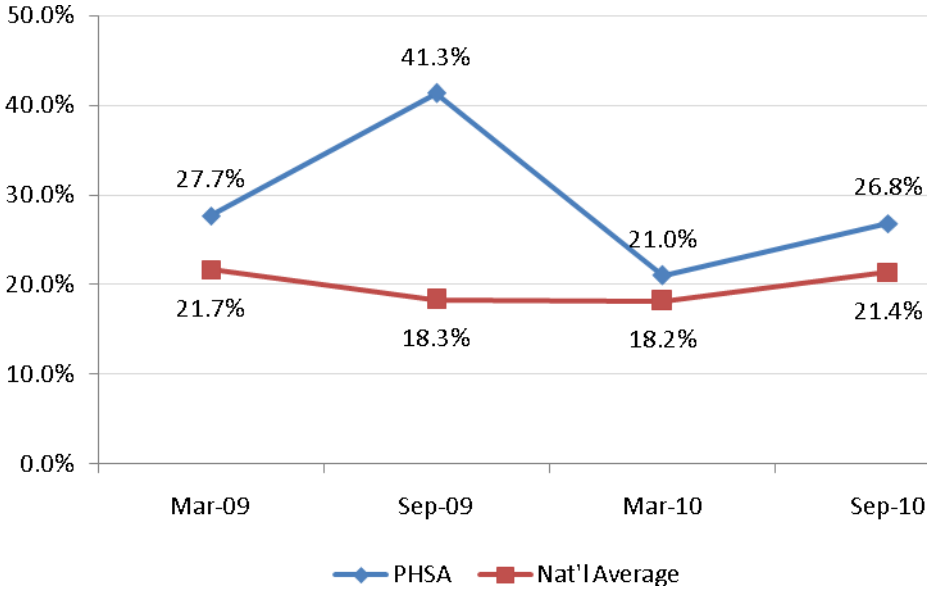
Figure 4

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



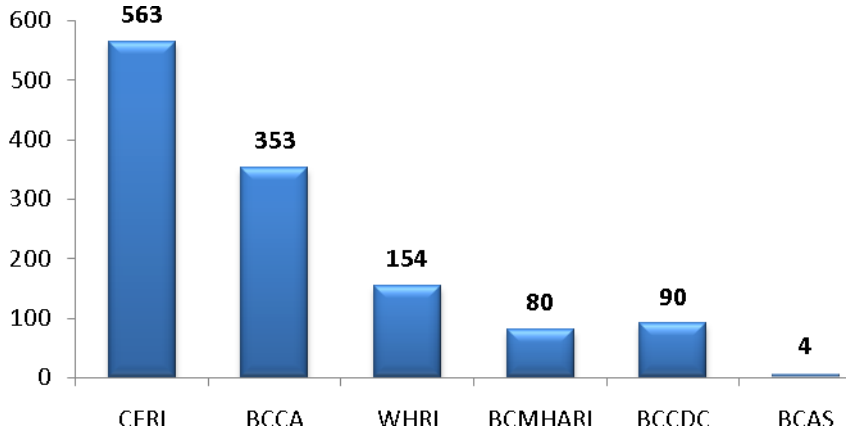
Again this year, PHSA researchers have achieved positive success rates in the two most recent CIHR operating grant competitions (March 2010 and September 2010). In both competitions, PHSA researchers' success rates were better than the national averages. Figure 5 below shows the overall success rates based on revised competition results for the last two 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 also presented for comparison.

Figure 5
PHSA CIHR Application Success Rate



Efforts to measure production and advancement of knowledge are expanded in this year's report with the addition of baseline Total # of Publications data. 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, and e-journals. See Figure 6 for a breakdown by agency. 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.

Figure 6
Total Number of Publications by Agency



Building Research Capacity

PHSA research entities identified 633 researchers in 2010/11 (up 107 from 2009/10) (see Table 1 and Figure 7). BCCA, BCMHARI and CFRI are able to report their researchers utilizing CFRI definitional categories, which highlight the amount of time protected for research purposes. Two changes to these categories were made in FY 2010-11. First, CFRI introduced a shared membership sub-category, available to those in Cat 1, 2 or 3. This new category allows individuals to formally declare their alignments (including percentage affiliation) with more than one organization. A total of 7 CFRI researchers are in this category and share with either another PHSA research entity or SFU. In addition, they removed all Emeritus faculty from category 4 which leaves only affiliate investigators that are not based on site but who collaborate with CFRI members.

BCAS, 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.

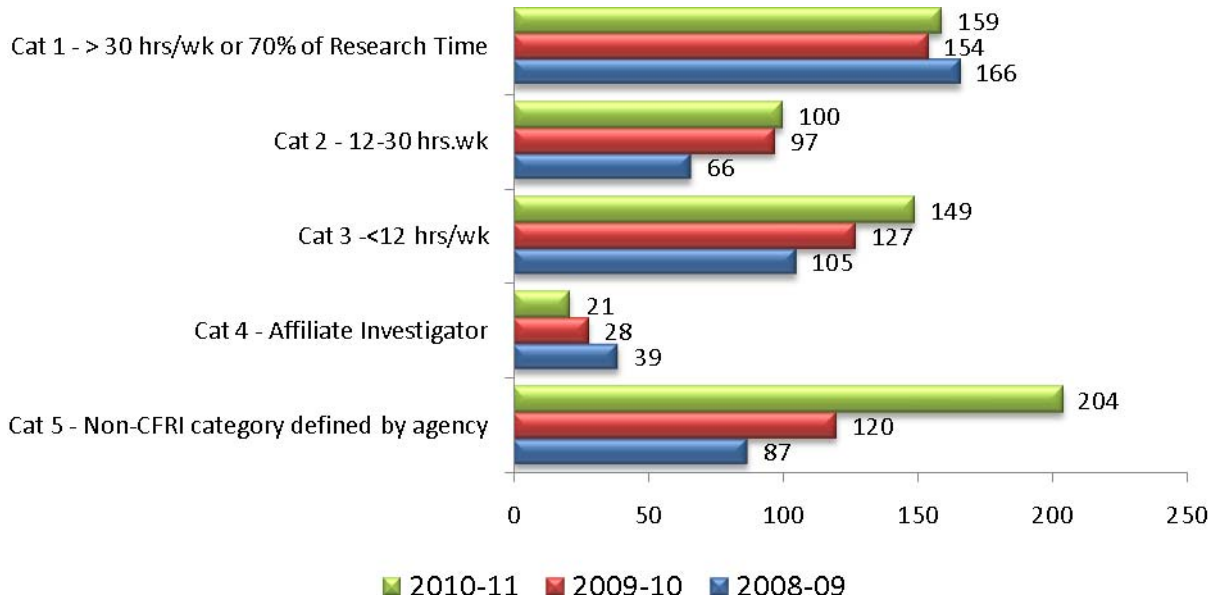
Table 1
Total Number of PHSA Researchers by Category and Agency

	BCAS*		BCCA			BCCDC			BCMHARI			CFRI			WHRI			Grand Total		
	09-10	10-11	08-09	09-10	10-11	08-09	09-10	10-11	08-09	09-10	10-11	08-09	09-10	10-11	08-09	09-10	10-11	08-09	09-10	10-11
Cat 1 - > 30 hrs/wk or 70% of Res. Time			69	556.5	58.5				15	13	14	81	84.5	86.5	1			166	154	159
Cat 2 - 12-30 hrs/wk			40	74	74				3	4	3	23	19	23				66	97	100
Cat 3 -<12 hrs/wk			19	32	45				12	14	13	72	81	91	2			105	127	149
Cat 4 - Affiliate Investigator			3									26	28	21	10			39	28	21
Cat 5 - See agency definition	3	3	25	26	100	20	26	32							42	65	69	87	120	204
Grand Total	**3**	**3**	**156**	**188.5**	**277.5**	**20**	**26**	**32**	**30**	**31**	**30**	**202**	**212.5**	**221.5**	**55**	**65**	**69**	**463**	**526**	**633**

*Category 5 definition for BCAS: BCAS Investigators do not have research appointments with a university. BCAS investigators partner with university affiliated investigators (categories 1-4) in an effort to meet mutually beneficial knowledge generation goals.

Figure 7

Total Number of PHSA Researchers by Category



During FY 2010-11, PHSA researchers provided training and supervision to a total of 1,147 research trainees and increase of 21% (or 199) from FY 2009-10. Post-doctoral fellows (214), and Practicum, Co-op, honours and directed studies students (195) increased by more than 25%. Residents (84) increased 37%. Since several of PHSA's research entities are small and in a phase of rapid growth, increases of this nature are expected. As the number of investigators increases, they are able to take on more training. This is a significant metric because the training of 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 comprise a critical workforce within research as they conduct much of the actual research under the supervision of Principal Investigators. See Figure 8 and 9 for the number of trainees by type and fiscal year for PHSA overall.

Figure 8
Total Number of PHSA Trainees by Fiscal Year

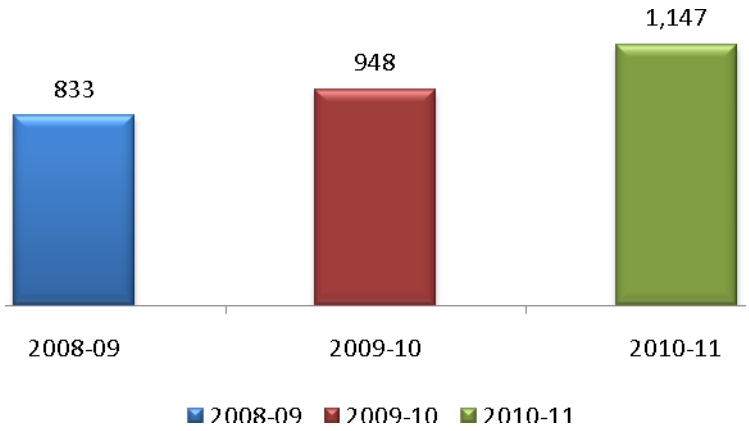
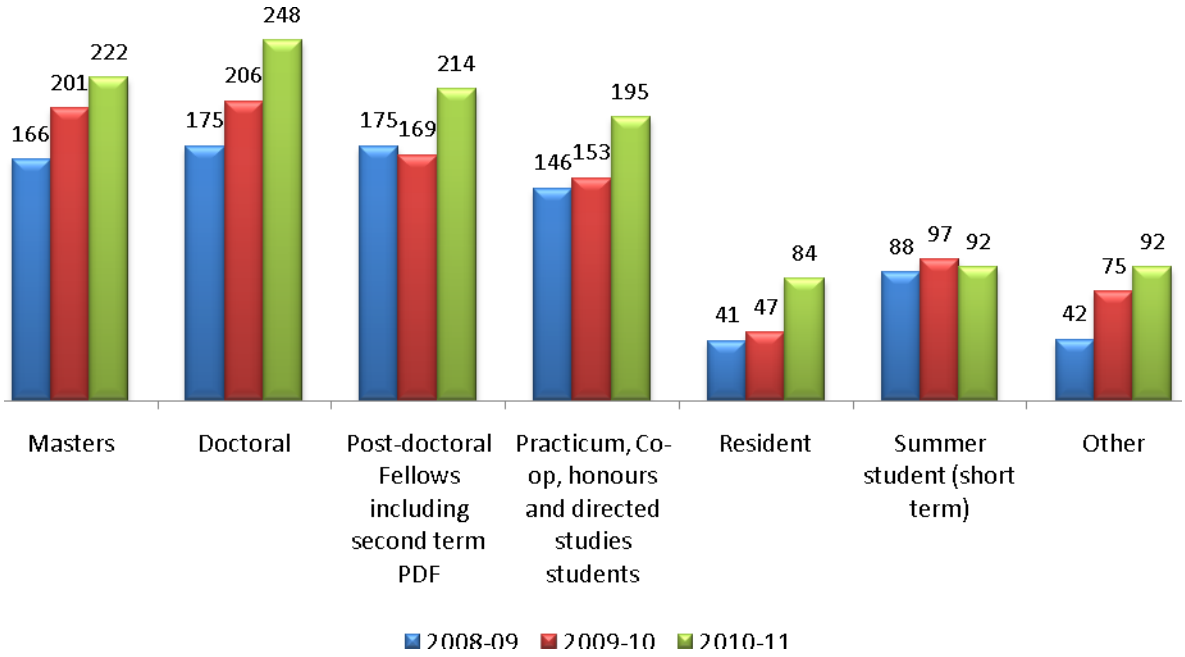


Figure 9

Total Number of PHSA Trainees by Type by Fiscal Year



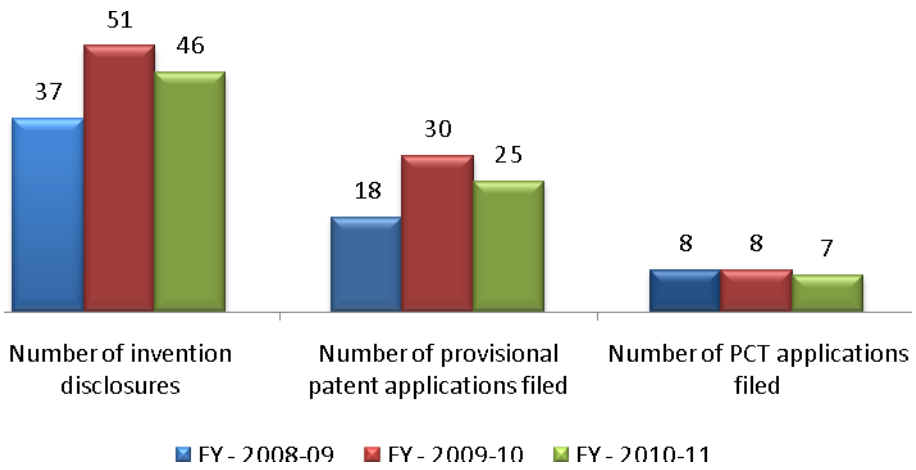
Achieving Economic Benefits and Innovation

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. Both BCCA, since FY 2008-09 (through the Technology Development Office (TDO)) and CFRI, since FY 2009-10 (through UILO) have been able to report patent, licensing and spin-off data. Further work is underway to more clearly define revenues resulting from discoveries to report PHSA overall data. Agency specific IP related revenue data is provided in agency sections.

See Figure 10 for total number of invention disclosure, provisional patent and PCT applications filed by fiscal year. Note that 2008-09 totals are for BCCA only. 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.

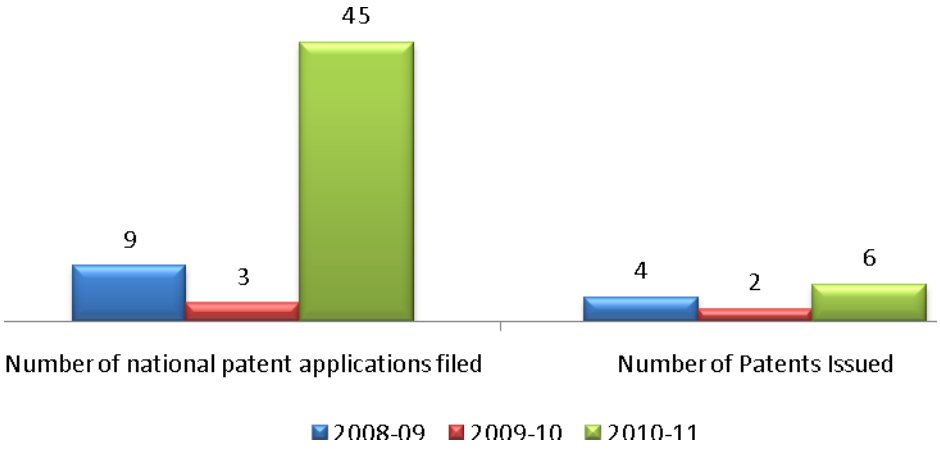
Figure 10

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



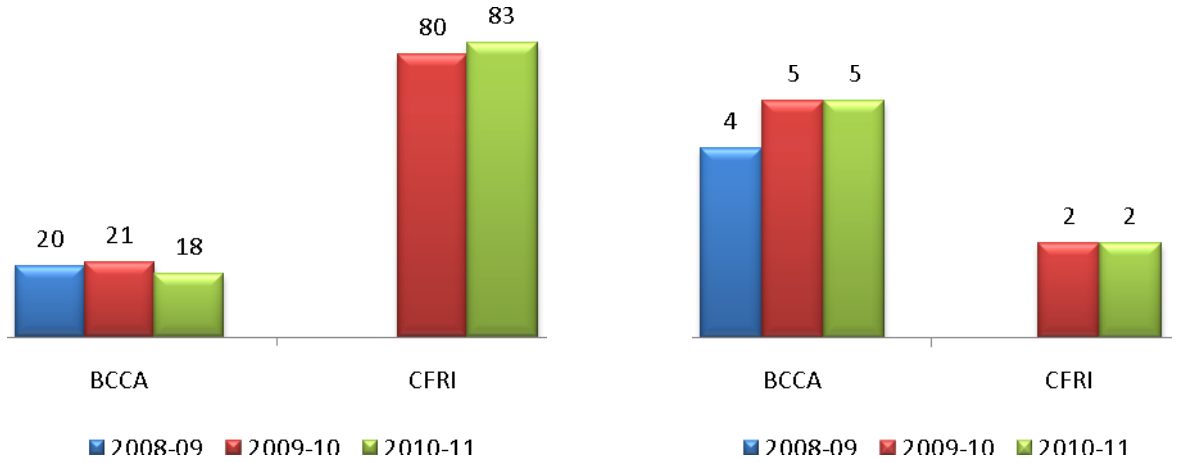
Patents are reported in Figure 11 below. Applications filed in a given year represent different applications than those which are approved in that same year (which typically are the result of applications in previous years). The large increase seen in applications filed in FY 2010-11 is the result of BCCA forming a spinoff company, Essa Pharmaceuticals (for the development of prostate cancer drugs). Thirty-two (32) of the 45 Patent applications filed were the result of extensive worldwide patenting of the compounds.

Figure 11
Total # of National Provisional Patent Applications Filed by Fiscal Year



Licensing agreements, as well as # of spin-off companies have remained relatively stable from year to year (see Figure 12). Both License Agreements and Spin-off companies can expire during the fiscal year.

Figure 12
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 again providing clinical trial data. Collection of data is still challenging and inconsistent across sites but is provided for two fiscal years. A total of 11,089 patients (see Table 3) were enrolled in clinical trials across the Children's & Women's Oak Street site and the BC Cancer Agency during FY 2010-11. The increase in the number of clinical trials in FY 2010-11 is most likely due to better data collection methodologies and the inclusion of the HPV Focal study from BCCA this year. The opportunity to participate in clinical trials is an important metric because it offers patients the highest possible quality of care through access to new evidence-based treatments that are not yet standard care. 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.

Table 2
Total # of Clinical Trials and Total Subject Enrollment by Fiscal Year

	CFRI		WHRI		BCMHARI		BCCA		PHSA Total	
	09-10	10-11	09-10	10-11	09-10	10-11	09-10	10-11	**09-10**	**10-11**
Total Number of active Clinical Trials	118	161	20	25	4	4		252	**142**	**442**
Total Number of Active Trials at end of FY	104	127	15	18	3	3		224	**122**	**372**
Total Number of Trials that closed during FY	14	34	5	7	1	1		28	**20**	**70**
Expected Local Subject Enrolment (for the term of the study)	4,338	8,403	2,287	1,981	403	395		34,829	**7,028**	**45,608**
Total Subject enrolment to end of FY	1,974	4,105	925	1,171	277	322		23,382	**3,176**	**28,980**
Total Subject enrolment during the period April 1 to March 31 of FY	684	1,172	351	916	82	67	899	8,934	**2,016**	**11,089**

Achievements in advancing health and policy benefits were collected, for a third 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 2010/11 as a result of research driven by PHSA researchers. 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 2010/11, researchers affiliated with BCCA were awarded a total of $68,679,238 in research funding, a decrease from FY 2009-10, attributable to the impact of Major CFI grants. The amount awarded as Operating Grants ($54,999,877) makes up 80.1% of total funding received. A breakdown of funding types and subtypes, including and excluding major CFI grants, can be found in Figures 13 and 14. Total funding, excluding major CFI grants, increased by more than 7 million from the previous year.

Figure 13

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

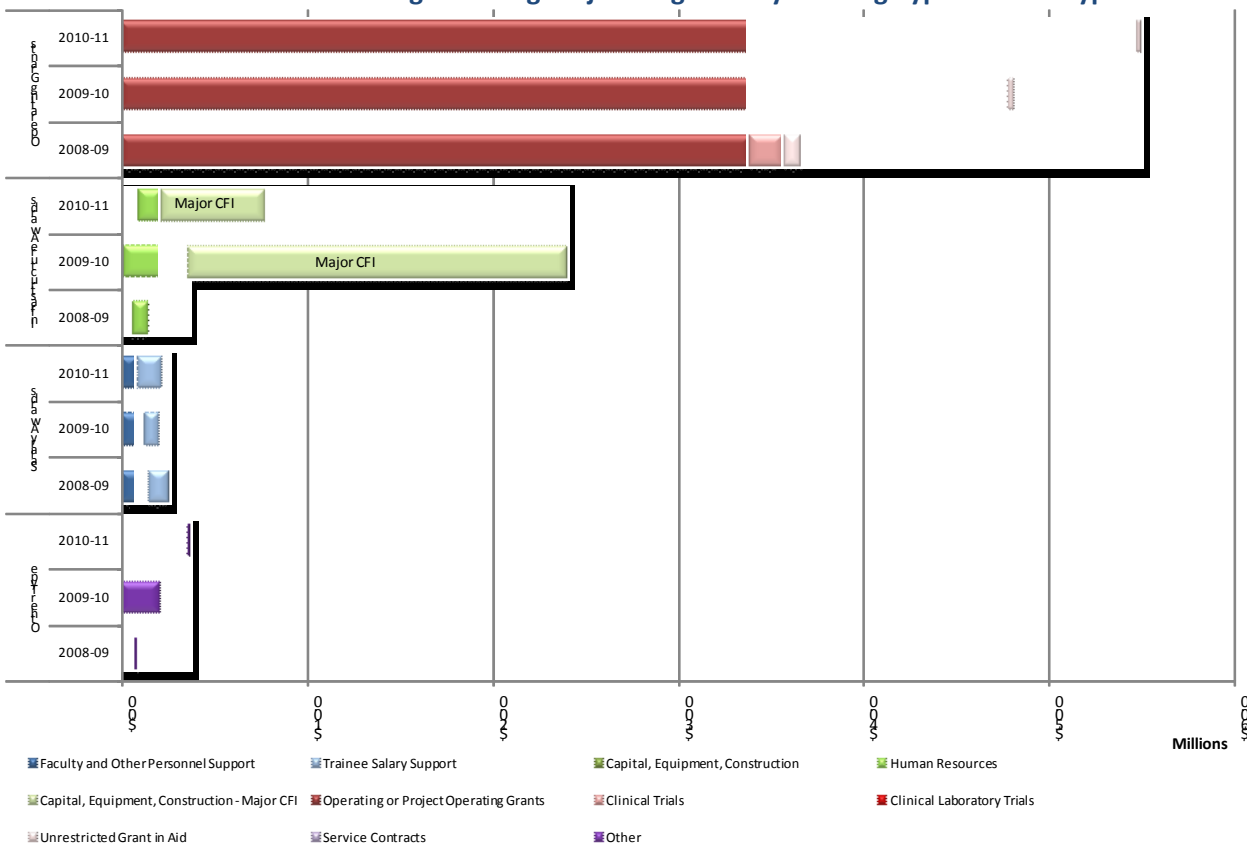
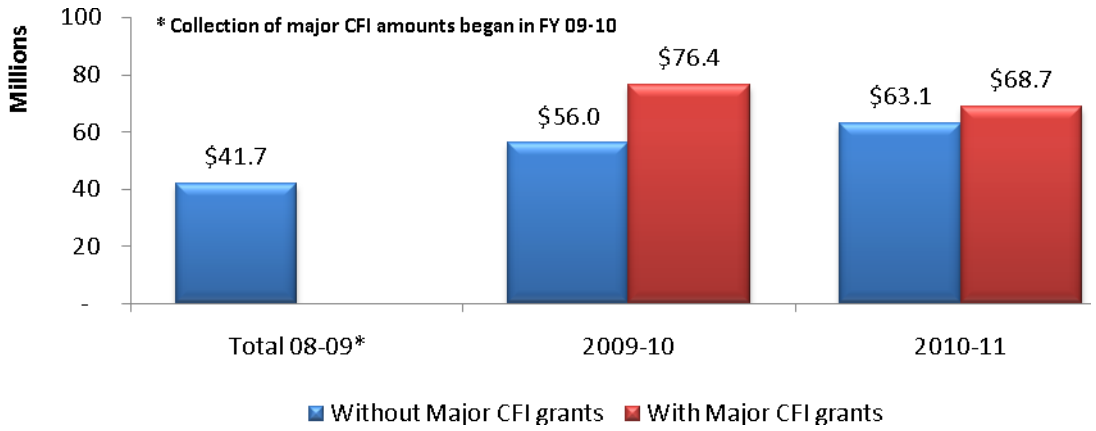


Figure 14

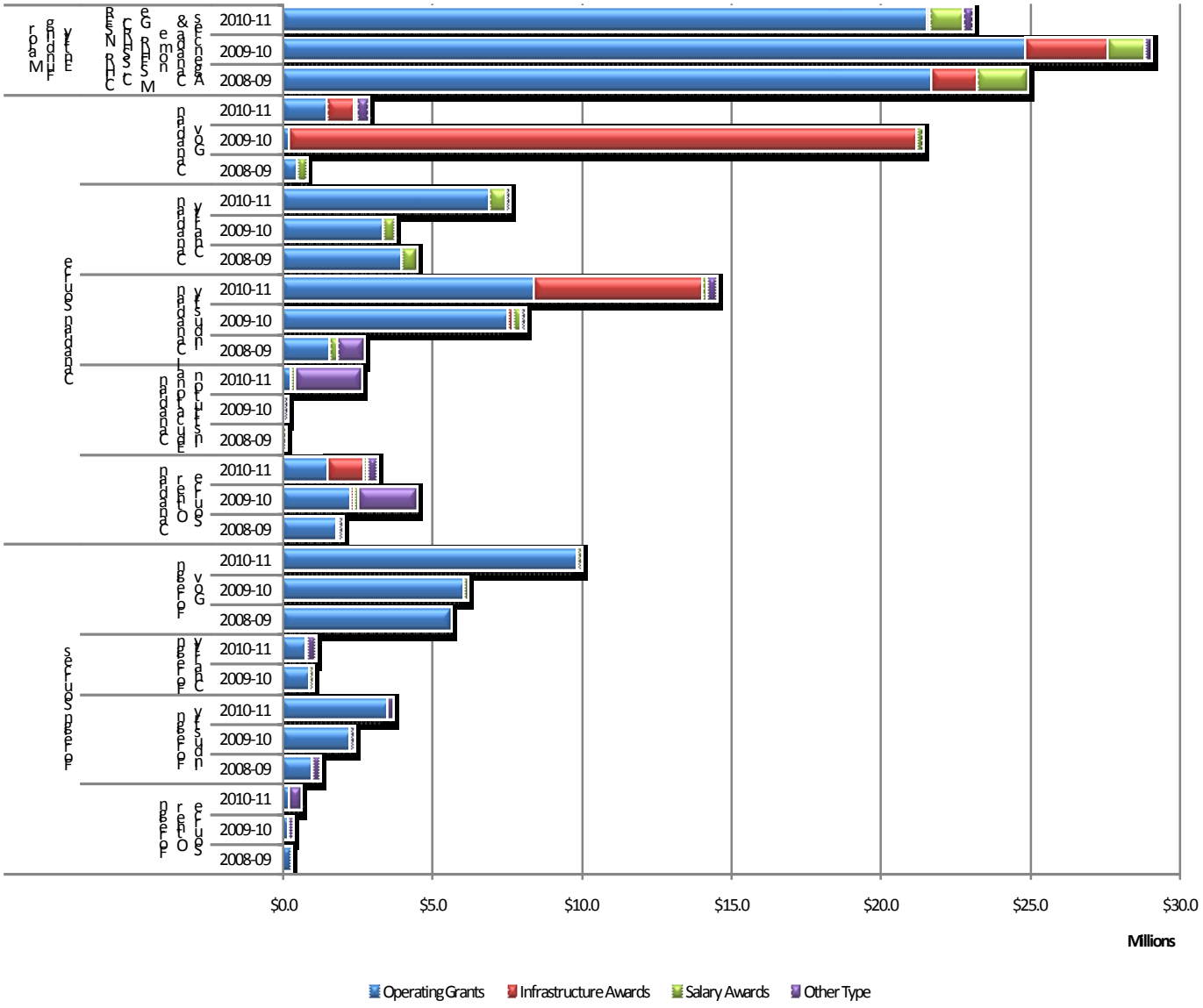
Total BCCA Research Funding Totals With/Without Major CFI Grants



The top two funding categories are Major Canadian Funding Entity (33.5%) and Canadian Industry (21.0%). Figure 15 details the major funding categories by funding type. Canadian Government dropped significantly due to one Major CFI infrastructure grant. The large increase in Canadian Industry is due to vendor matching funds for major CFI grants. Funding sources are detailed in Appendix 5.

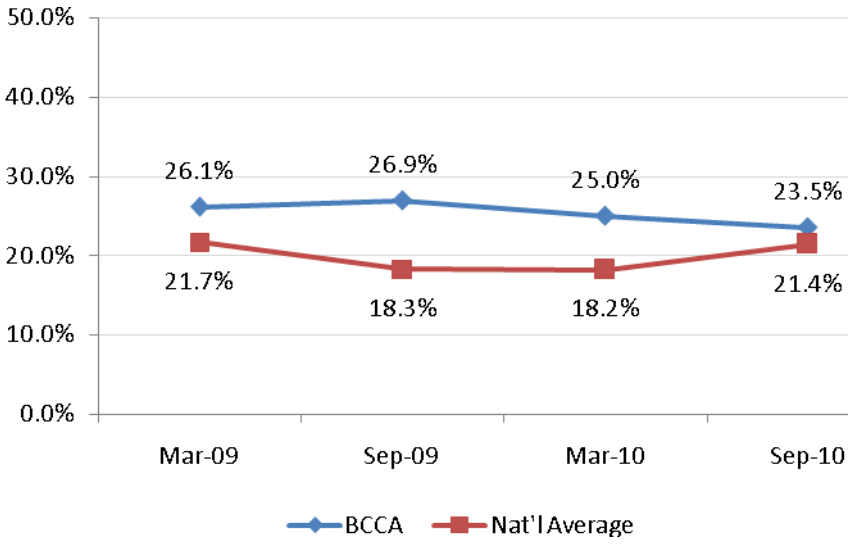
Figure 15

BCCA Research Funding, including Major CFI grants by Funding Source Category and Type



BCCA has demonstrated success in recent CIHR operating grant competitions, exceeding the national average. Figure 16 below shows CIHR grant application success rates for BCCA compared to the national average.

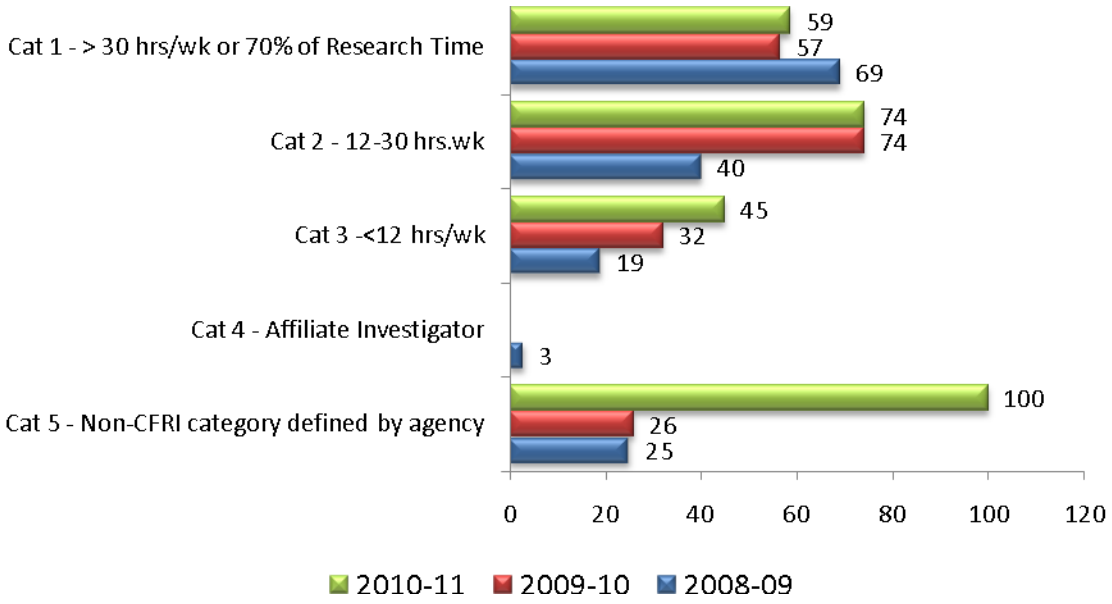
Figure 16
BCCA's CIHR Operating Grant Application Success Rate



Building Research Capacity

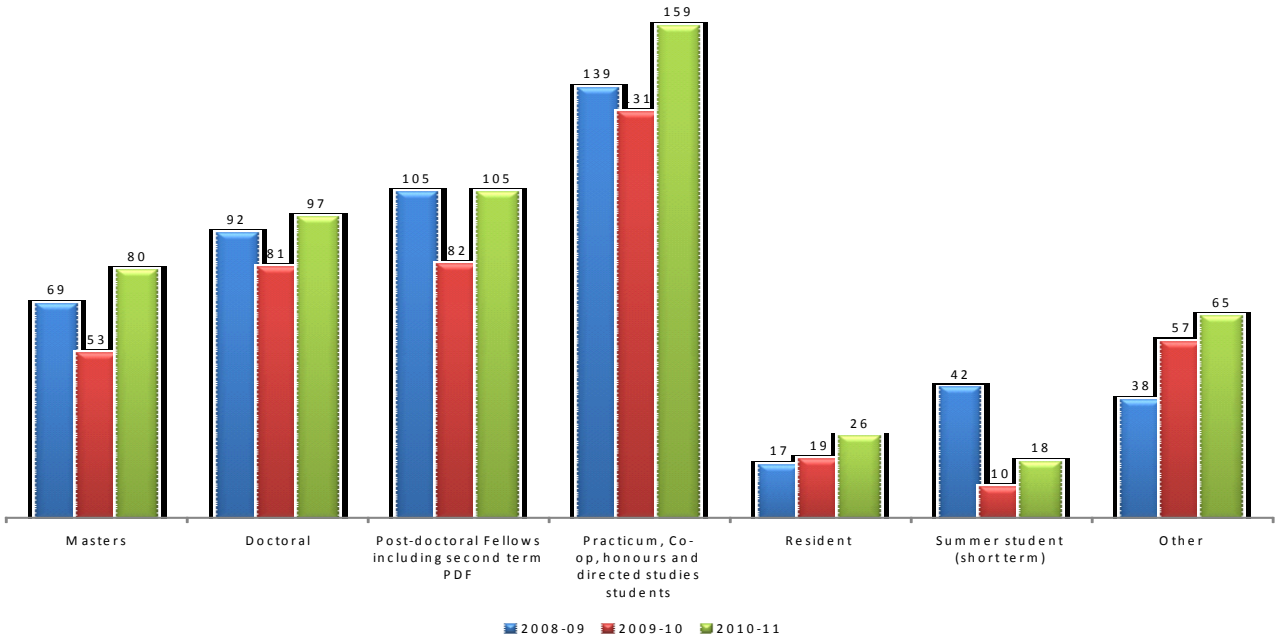
BCCA has a total of 277.5 researchers in FY 2010-11 (up 89 from 2009/10). While adoption of the CFRI category classifications is in place, a significant amount (100) of the total researchers are in Category 5, which is an agency specific category used to describe researchers that do not meet CFRI category classifications. For BCCA, the majority of Category 5 are Medical or Radiation Oncologists, Program or Practice Leaders, Research Scientists and Nurses. Data for FY 08-09 has been restated to reflect the appropriate categories. As in past year's reports, researchers whose funding is officially split 50:50 between research entities are classified as 0.5. See Figure 17 for the number of researchers by category.

Figure 17
Total Number of BCCA Researchers by Category and Fiscal Year



During FY 2010-11, BCCA researchers provided training and supervision to a total of 550 trainees (up 117 from 2009/10). The largest increase was seen in Masters (27) and Practicum, Co-op, honours and directed studies students (28). The Other category is described as Research Associates. See Figure 18 for the number of trainees by type.

Figure 18
Total Number of BCCA Trainees by Type and Fiscal Year

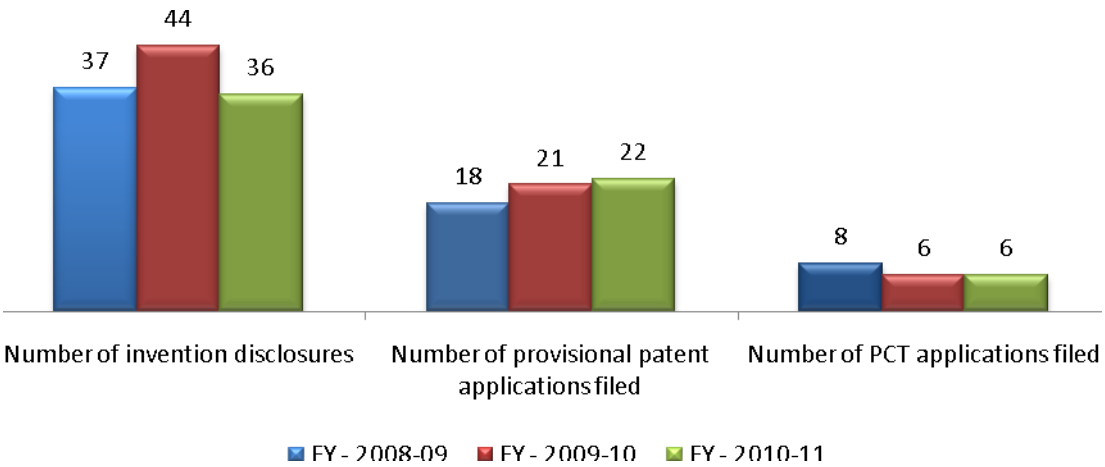


Achieving Economic Benefits and Innovation

BCCA Technology Development Office (TDO) Activities

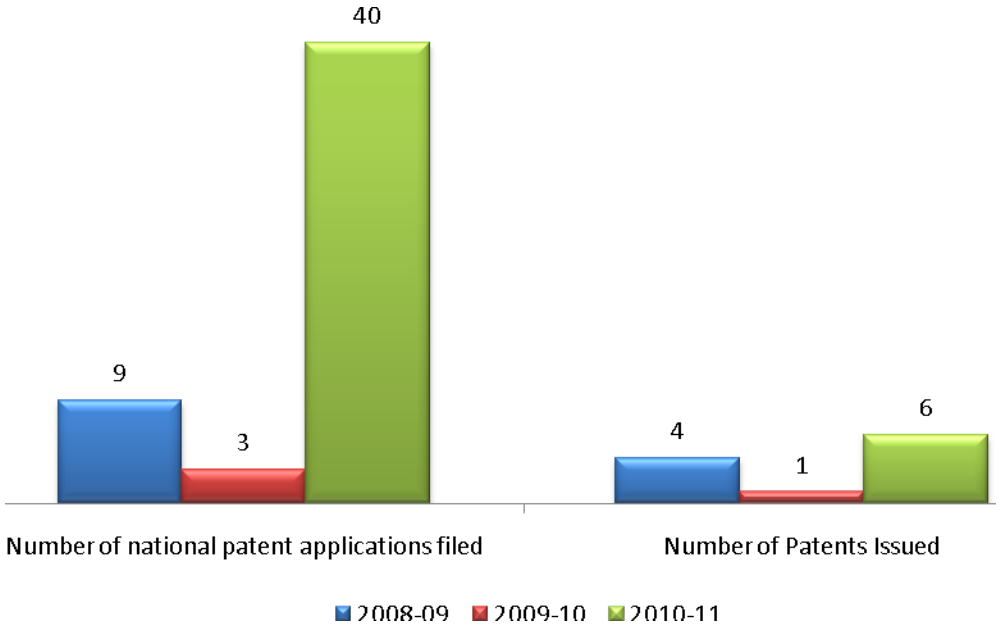
Invention disclosures are primarily internal BCCA documents, filed with TDO to inform the decision of whether or not to proceed with the patent process. The next stage in the patent process is to file provisional patent applications followed by patent cooperative treaties, or PCTs, which act as gateway world-wide patents. See Figure 19 for patent activity statistics.

Figure 19
BCCA TDO Invention Disclosures, Provisional Patent and PCT Applications by Fiscal Year



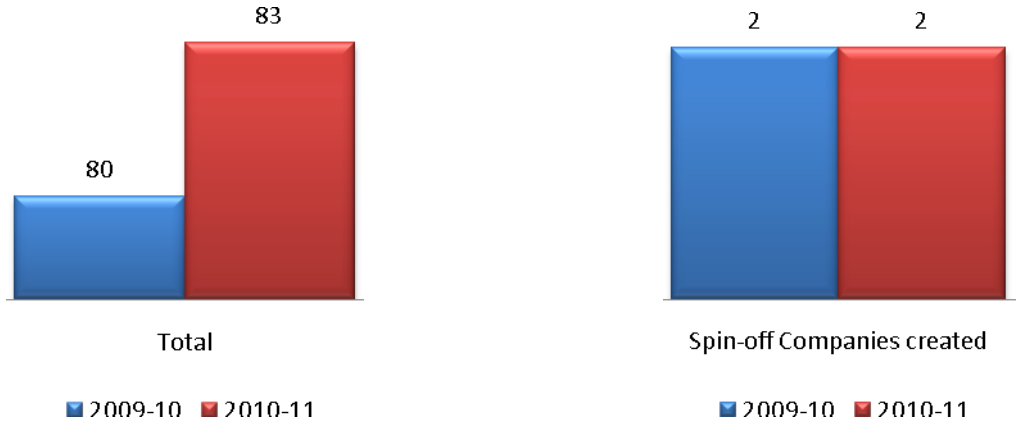
National patent applications are then filed with each step involving greater specificity. Patent applications filed in a given year represent different applications than those which are approved in that same year (which typically are the result of applications in previous years). Thirty-two (32) of the forty (40) national patent applications filed were the result of extensive worldwide patenting of the compounds of Essa Pharmaceuticals for the development of prostate cancer drugs. See Figure 20 for a breakdown by Fiscal Year.

Figure 20
BCCA TDO National Patent Activity by Fiscal Year



In 2010-11, there were 18 active license agreements. Declines from previous fiscal years are due to the expiration of active license agreements. There was also one new spin-off company created, Veristane Pharmaceuticals and one company, Capilano Genomics, that became inactive in FY 2010-11. Other active Spin-off companies include Aquinox Pharmaceuticals, Essa Pharmaceuticals, Repeat Diagnostics, and Upstream Biosciences.

Figure 21
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). See Table 3 for FY 2010-11 baseline data. While distribution agreements vary, typically the inventor receives 50% of the net licensing revenue, with the remainder split between PHSA, BCCA departments, and UBC for those researchers with a UBC affiliation.

Table 3
TDO IP Related Revenue for FY 2010-11

IP Related Revenue (April 1, 2010 - March 31, 2011)		
Royalties	$	94,276.55
Equity Liquidated	$	-
License Fees	$	138,270.00
License Management	$	-
Option Fees	$	-
Technology Assignment	$	-
Gross Licensing Revenue (total)	**$**	**232,546.55**
Expenses for patenting, legal & related costs	$	121,570.00
Net Licensing revenue	**$**	**110,976.55**
Realized Revenue per distribution agreement	$	21,585.04

Advancing Health and Policy Benefits

BCCA manually collects the total number of accrued (or enrolled) patients to clinical trials. This year they can report consistent categories of numbers with other PHSA research entities. Table 4 presents the numbers of patients accrued/enrolled in each of fiscal years 2009/10 and 2010/11.

Table 4
BCCA Clinical Trials

	09-10	**10-11**
Total Number of Clinical Trials active during the FY		252
Status of the Trial as of March 31 in the FY:		
Total Number of Active Trials		224
Total Number of Trials that closed during the FY		28
Enrolment Numbers:		
Expected Local Subject Enrolment (for the term of the study)		45,608
Total Subject enrolment to March 31 of the FY		28,980
Total Subject enrolment during the period April 1 to March 31 of the FY	899	11,089

Following are key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2010-11 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 5
BCCA Outcome Survey Responses

Guideline, drug, diagnostic agent, or device adopted or approved in 2010/2011 as a result of research driven by PHSA researchers	**Benefits to patients, population health, and/or health system sustainability of the items identified**
Developed the evidence to support improved guidelines for BRCA testing of ovarian cancer.	More at risk women will be identified and less low risk women will be tested.
Discovered ARID1a mutations in ovarian and endometrial cancers.	Assay to determine which women with endometriosis are at risk of cancer is being developed.
Instituted a surgical practice change to reduce ovarian cancer morbidity and mortality.	OvCaRe (Ovarian Cancer Research) expects that over the next 10 years ovarian cancer rates will start to drop in BC.
Developed HER-2 assay for the assessment of gastric cancers.	Gastric HeR-2 testing algorithm from CTAG (Centre for Translational and Applied Genomics) is both less costly and faster than previous methods adopted.
Developed FoxL2 mutation as an ovarian cancer diagnostic.	FoxL2 assay for granulosa cell tumour now available free to BC patients.
Converted the research based familial stomach cancer test to a clinical one.	CAP accredited hereditary gastric cancer test to be provided free to BC Patients.

Child & Family Research Institute (CFRI)

Producing and Advancing Knowledge

In FY 2010/11, researchers affiliated with CFRI were awarded a total of $60,759,966 in research funding. The amounts awarded as Operating Grants ($33,344,105) and Infrastructure Awards ($19,579,639) make up approximately 82% of total funding received. A breakdown of funding types and subtypes can be found in Figure 22. Figure 23 presents the total funding dollar difference between including and excluding major CFI infrastructure grants.

Figure 22

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

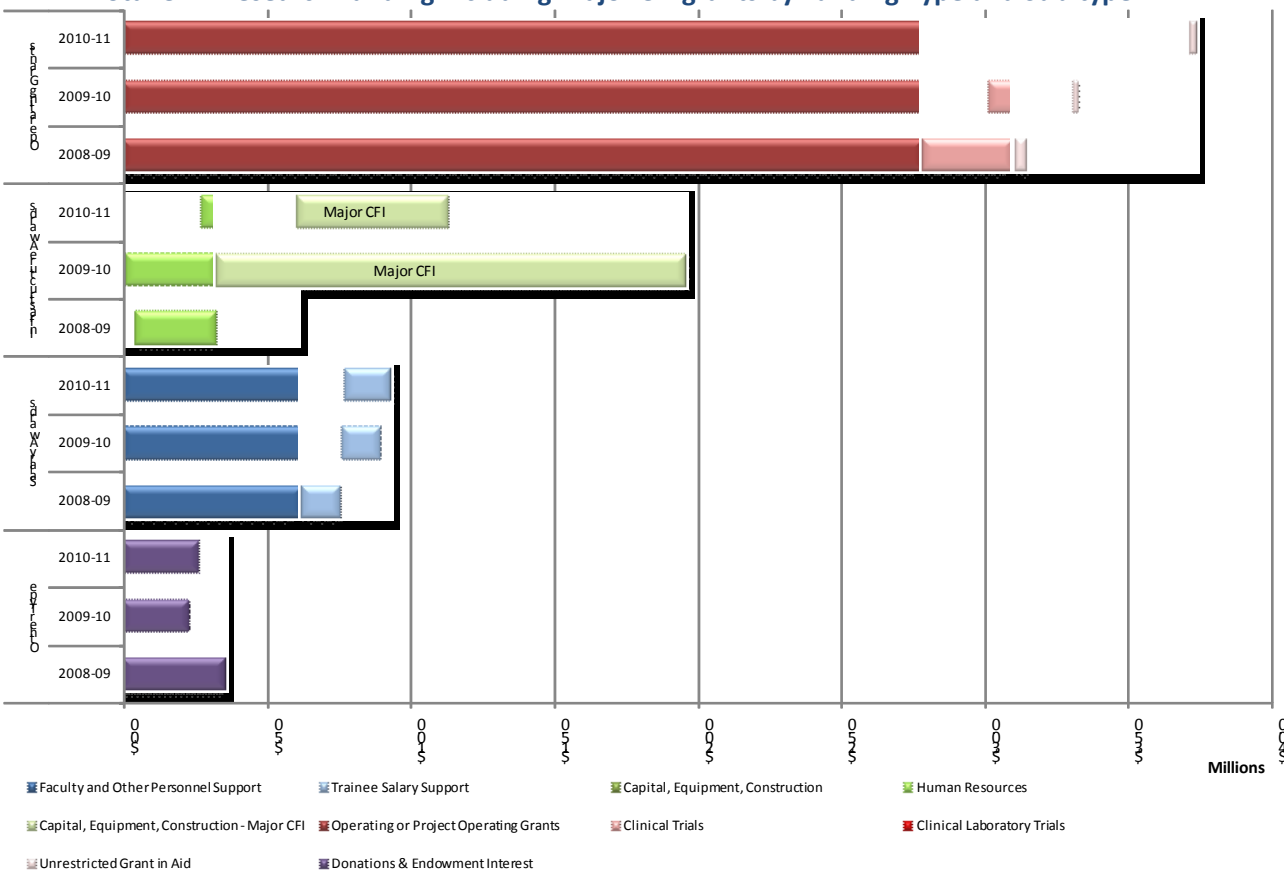
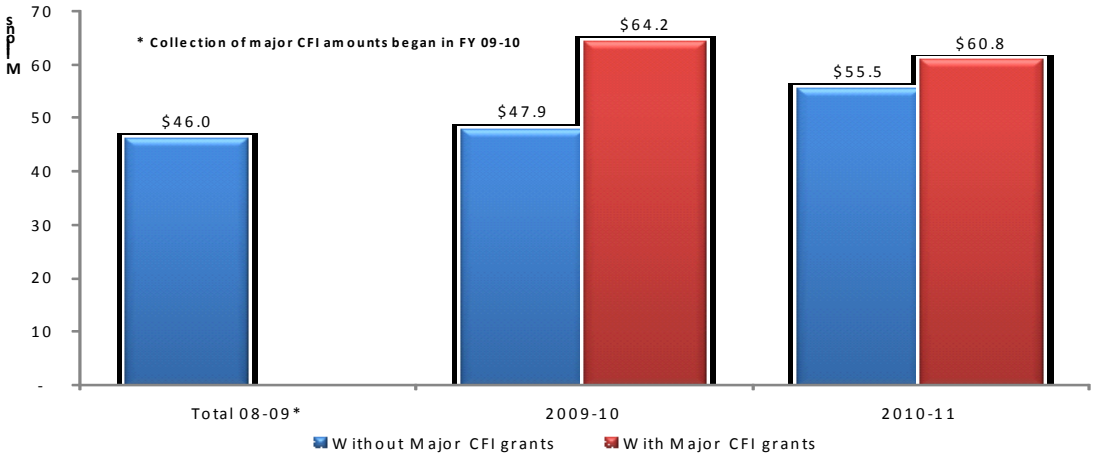


Figure 23

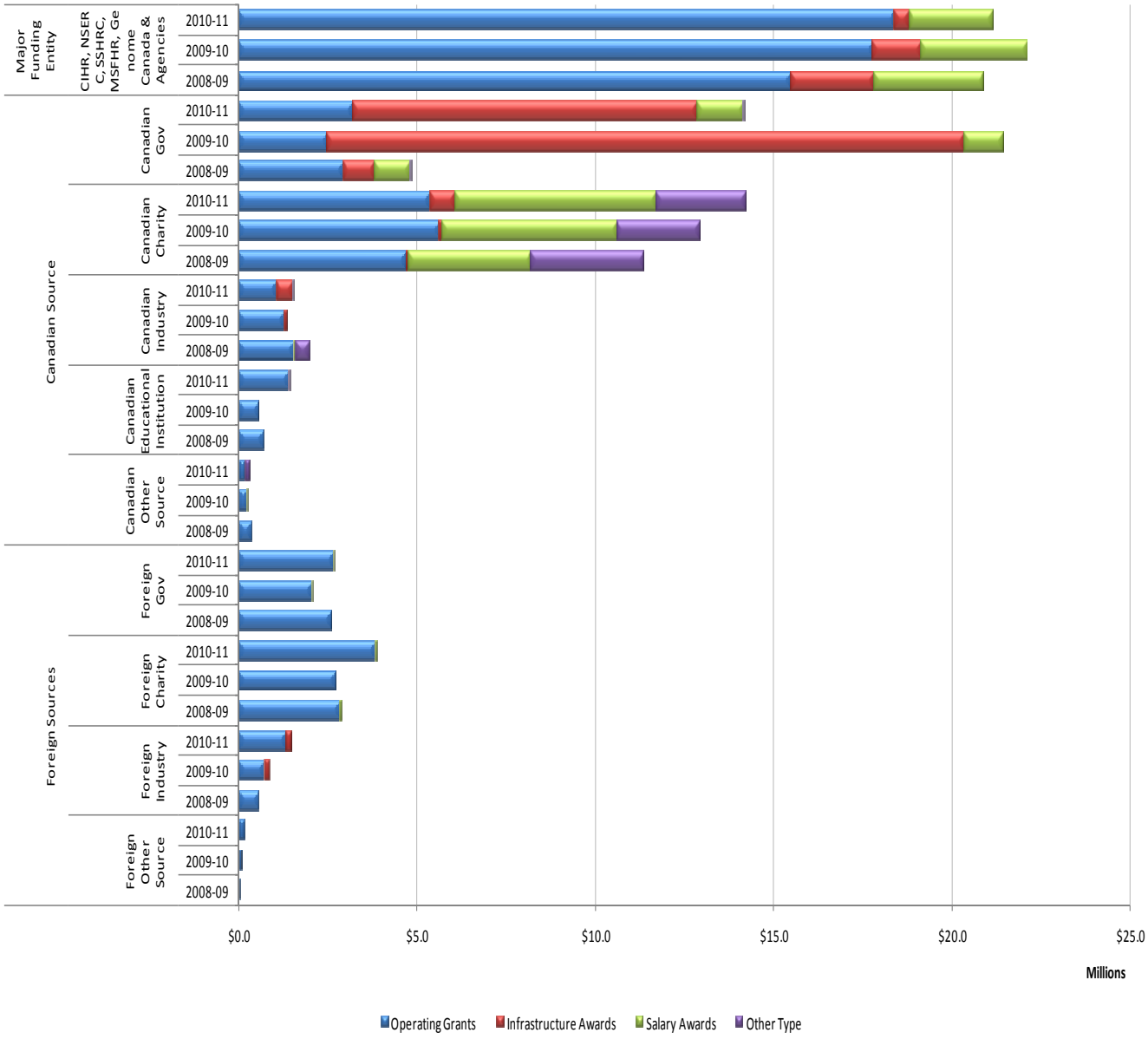
Total CFRI Research Funding Totals With/Without Major CFI Grants



The top three funding categories are Major Canadian Funding Entity (34.8%), Canadian Charity (23.4%) and Canadian Government (23.3%). Figure 24 details the major funding categories by funding type. Funding sources are detailed in Appendix 6.

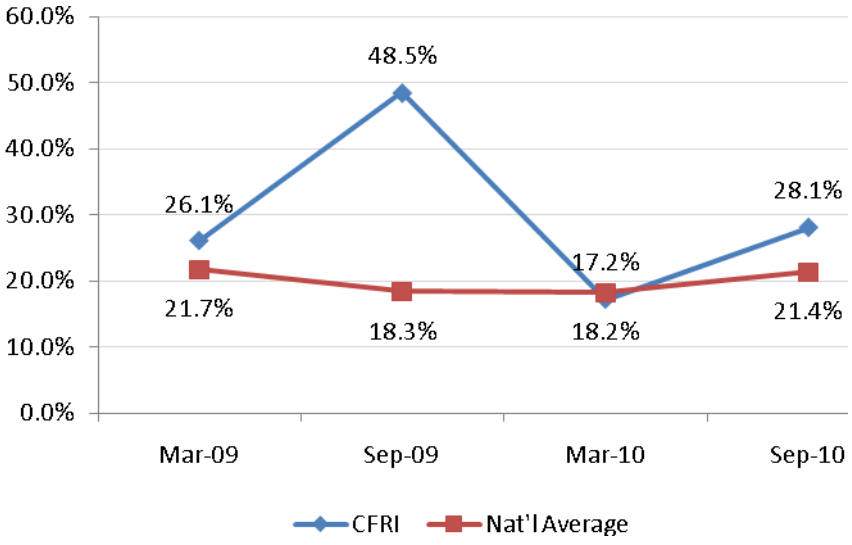
Figure 24

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



CFRI has demonstrated success in recent CIHR operating grant competitions, exceeding the national average in three of the most recent competitions. Figure 25 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).

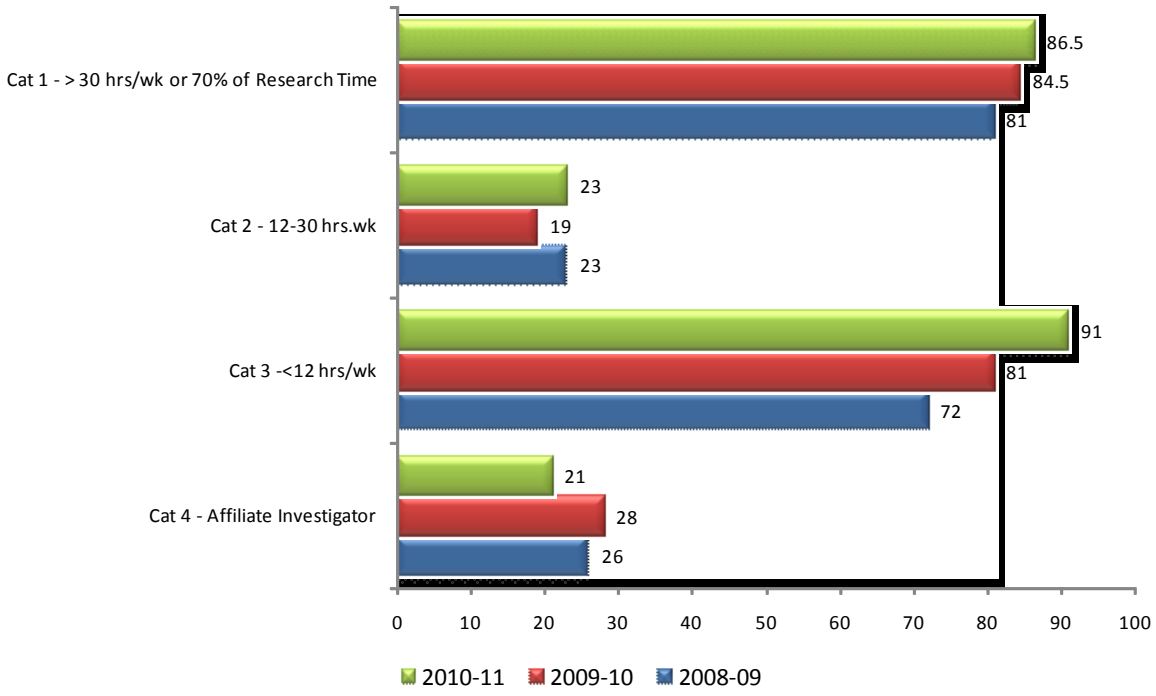
Figure 25
CFRI's CIHR Operating Grant Application Success Rate



Building Research Capacity

CFRI has a total of 221.5 researchers. As in past reports, researcher who's funding is officially split 50:50 between BCCA and CFRI have been counted as 0.5 under each of those two research entities. The distribution of these researchers is represented in Figure 26 below. Researchers in categories 1 to 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. Two changes to these categories were made in FY 2010-11. First, CFRI introduced a shared membership sub-category, available to those in Cat 1, 2 or 3. This new category allows individuals to formally declare their alignments (including percentage affiliation) with more than one organization. A total of 7 CFRI researchers are in this category and share with either another PHSA research entity or SFU. In addition, they removed all Emeritus faculties from category 4.

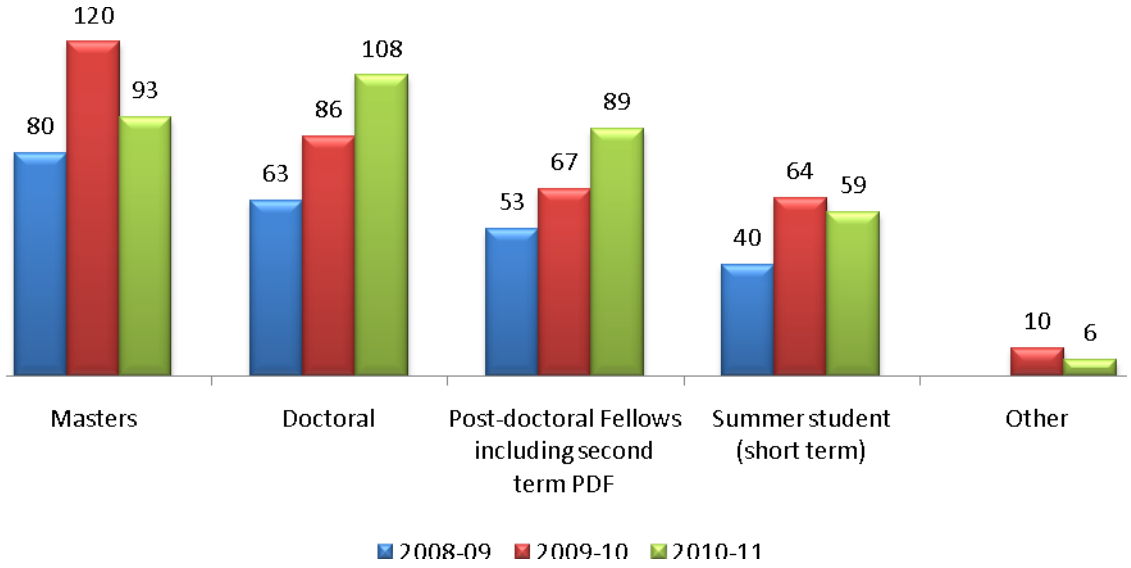
Figure 26
Total Number of CFRI Researchers by Category



During FY 2010-11, CFRI researchers provided training and supervision to a total of 355 (up 23 from 2010/11) trainees. This includes 89 post-doctoral fellows an increase of 22 and, 108 Doctorals, an increase of 22; see Figure 27 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 27

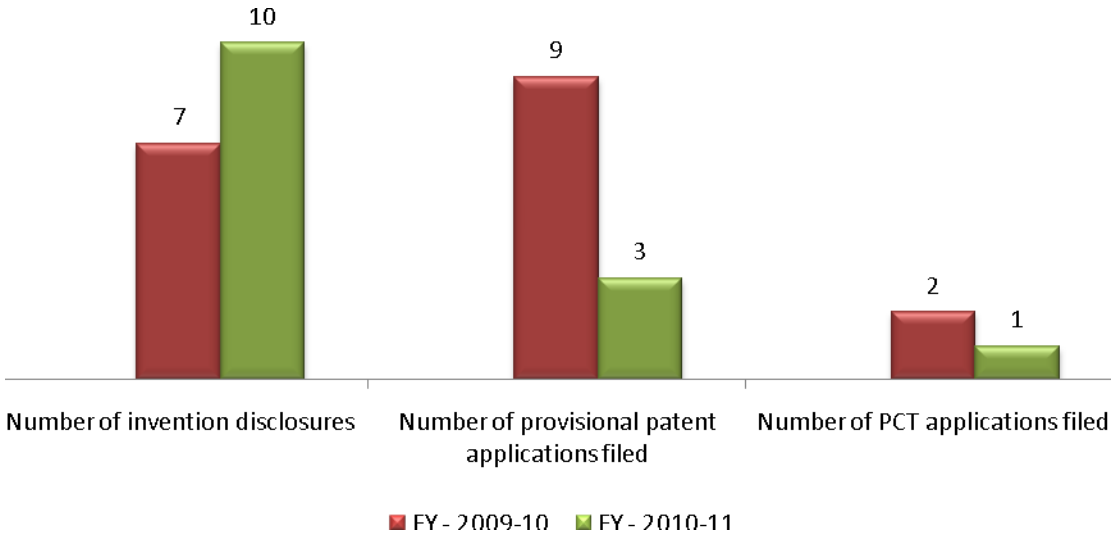
Total Number of CFRI Trainees by Type



Achieving Economic Benefits and Innovation

The number of invention disclosures, provisional patent and PCT applications filed by fiscal year are in Figure 28. CFRI did not report this metric in FY 2008-09.

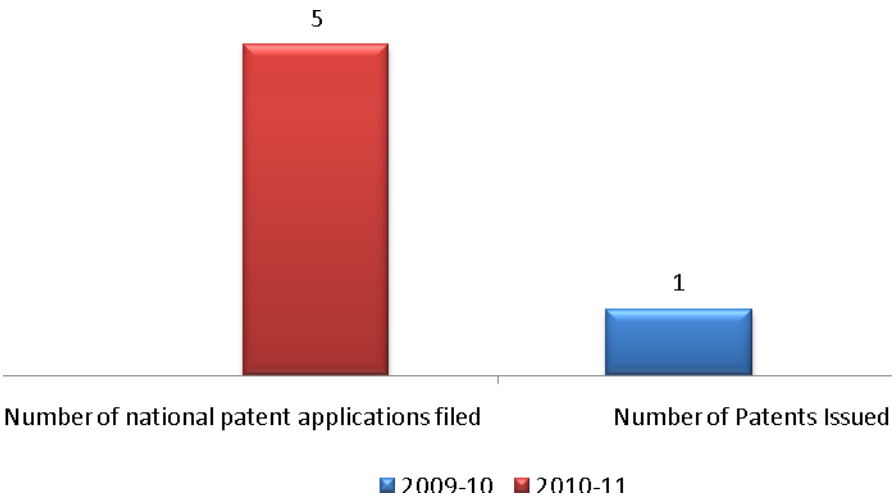
Figure 28
CFRI Invention Disclosures, Provisional Patent and PCT Applications Filed by Fiscal Year



Patents are reported in Figure 29 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).

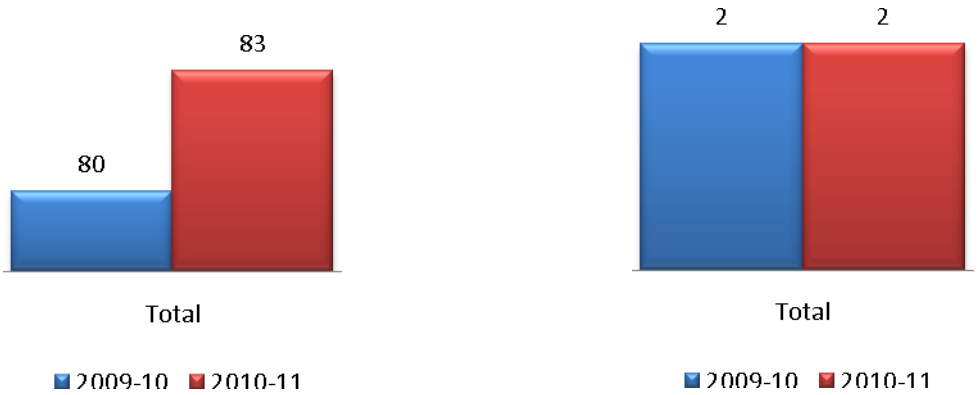
Figure 29

CFRI National Patent Activity by Fiscal Year



In FY 2010-11, there were 83 active license/assignment agreements in place (See Figure 30). Currently, two spin-off companies have been created. CFRI holds shares in three companies – Urodynamix Technologies (publicly traded), and BCY Lifesciences (publicly traded). Xenon Pharmaceuticals (private) is held in trust by UBC so is not included in the totals below.

Figure 30
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 6 for CFRI FY 2010-11 baseline data. 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. Currently, there is a cumulative net loss of revenue of $664,900. 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 6
CFRI IP Related Revenue for FY 2010-11

IP Related Revenue (April 1, 2010 - March 31, 2011)		
Royalties	$	7,833.33
Equity Liquidated	$	-
License Fees	$	-
License Management	$	-
Option Fees	$	-
Technology Assignment	$	24,723.66
Gross Licensing Revenue (total)	**$**	**32,556.99**
Expenses for patenting, legal & related costs	$	-
Net Licensing revenue	**$**	**32,556.99**
Realized Revenue per distribution agreement	$	32,556.99

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 7).

Table 7
CFRI Clinical Trials

	09-10	10-11
Total Number of Clinical Trials active during the FY	118	161
Status of the Trial as of March 31 of FY		
Total Number of Active Trials	104	127
Total Number of Trials that closed during the FY	14	34
Enrolment Numbers:		
Expected Local Subject Enrolment (for the term of the study)	4,338	8,403
Total Subject enrolment to March 31 of the FY	1,974	4,105
Total Subject enrolment during the period April 1 to March 31 of the FY	684	1,172

The following table 8 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2010-11 as a result of research driven by CFRI researchers, and their corresponding benefits. These outcomes represent important achievements in translational research that are improving patient outcomes and system sustainability.

Table 8
CFRI Outcomes Survey Responses

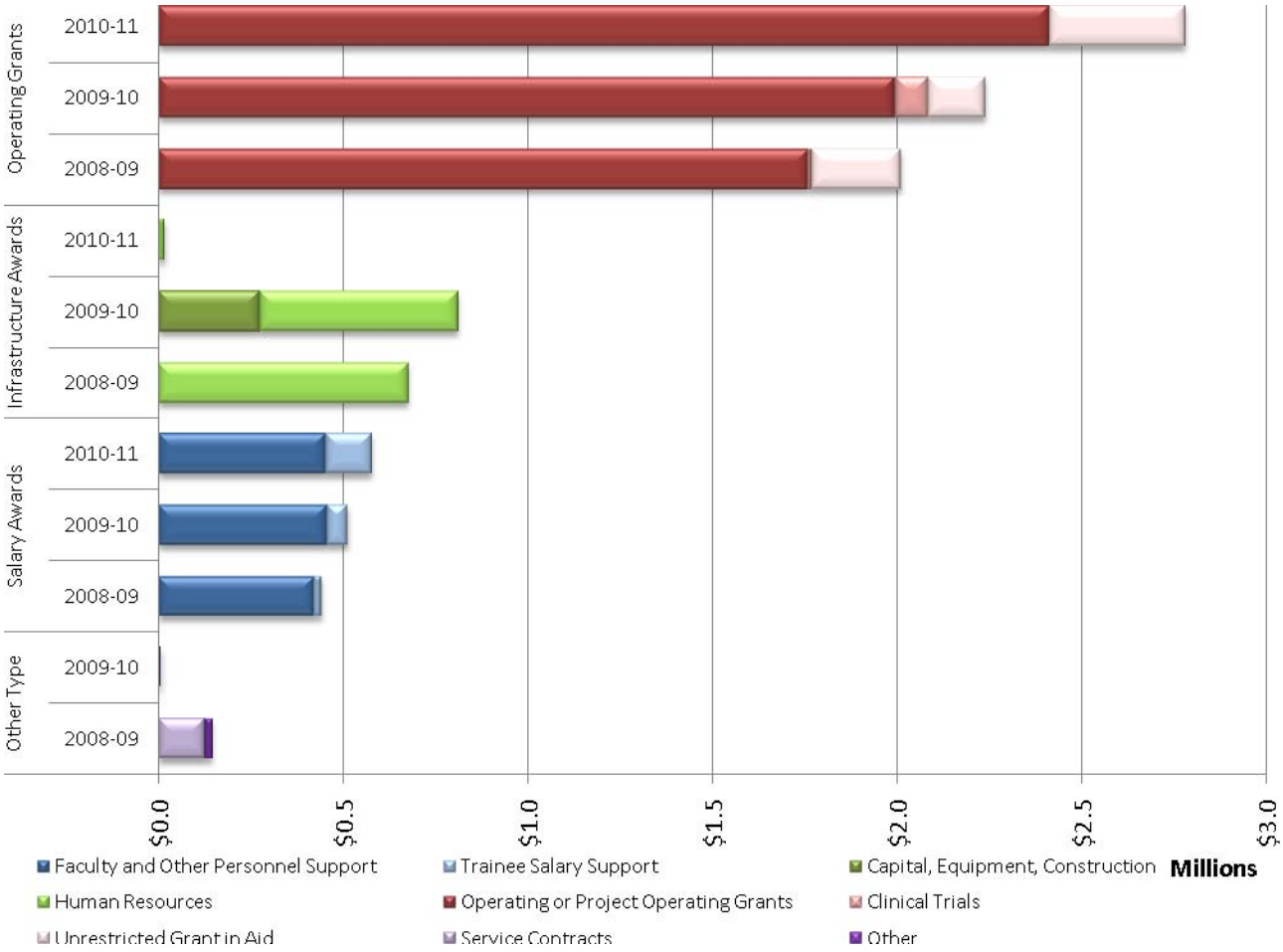
Guideline, drug, diagnostic agent or device adopted or approved in 2010/11as a result of research driven by PHSA researchers	**Benefits to patients, population health, and/or health system sustainability of the items identified**
Translating Research On Pain In Children (TROPIC) Study has resulted in the implementation of the BIIP (Behaviour Indicators of Pain) tool as part of standard practice for pain assessment in the NICU as well as implementation of non-pharmacological comfort measures (i.e. sucking soother, facilitated tucking) now offered as standard care during all routine painful/stressful procedures in the NICU.	Improved assessment and documentation of pain responses during routine painful NICU procedures; improved awareness of clinical staff of the effects of pain; improved pain management (specifically increased use of non-pharmacological comfort measures) with ultimately decreased pain experienced by patients.
Maternal Infant Care (MiCare) Study has resulted in the implementation of new skin-to-skin policy in the NICU.	Increased rate of skin-to-skin episodes documented over the year with ultimately improved infant-parent bonding and known benefits of kangaroo care experienced by patients.
Leg-length Shortening Following Femoral Line Placement - Guidelines regarding central line placement updated following research from the Neonatal follow-up clinic which showed an association between leg-length shortening in infants with femoral arterial lines.	Generated new knowledge about risks of central line placement, increased awareness amongst staff about risks and benefits of the procedure and reduction in long-term complications for patients.
The HPV vaccine trial showed positive results of the 2 versus 3 dose, resulting in the Communicable Disease Policy Committee decision to change the immunization schedule for Grade 6 girls in BC to 2 doses starting September 2010, followed if necessary by a third dose 5 years later. The project was given an Award of Merit in the Top Innovation category of the 2011 Excellence in BC Health Care Awards.	At a cost of about $100 per dose, one less dose, apart from one less "needle" for the child, reducing the schedule could result in a substantial cost saving to the province's immunization program. Elimination of the third dose will result in less work load for public health nurses and delivery costs for the program.
Society of Obstetricians and Gynaecologists of Canada (SOGC) Clinical Practice Guideline: Magnesium sulphate for fetal neuroprotection. JOGC 2011; 33(5):516-29	This guideline was funded in part by a MPD grant (CIHR). Active Knowledge Translation will likely follow from CIHR given our ranking (2/43 applications) in the March 2011 Operating Grants competition. It is a unique case of a maternal medication given to reduce an adverse outcome diagnosed in paediatrics (not neonatology). Data collection will involve the Canadian Perinatal, Neonatal, and Neonatal Follow-up Networks of MiCare.
Established evidence-based guidelines for infection control in patients with cystic fibrosis. Certain bacteria can be spread among patients, and we provide the data to clinicians indicating if such bacteria are present in the patients for whom they care. We are home to the Canadian Research and Repository for these bacteria and receive them from all CF clinics in Canada. This is the 30th year of operation of this bacterial collection, and we have over 14,000 isolates preserved.	The work we do aids in prevention of the most serious infections in patients with cystic fibrosis. Since our laboratory became the national laboratory in 1994, the spread of the most worrisome CF pathogens has fallen dramatically.
Participated in the development of a new Sepsis Guideline that has been developed internationally with the participation of Dr. K Kissoon.	This guideline covers diagnosis and treatment. It will benefit patients as delayed treatment is responsible for clinical deterioration with serious consequences. It will also help coordinate activities at BCCH for identifying and efficiently treating patients. Because this guideline is implemented using the Lean method and quality leaders, with the objective of engaging clinical staff in being proactive in diagnosing and treating septic patients, we expect the implementation process will also improve clinicians' attitudes toward the development and the use of clinical practice guidelines.

BC Mental Health and Addictions Research Institute (BCMHARI)

Producing and Advancing Knowledge

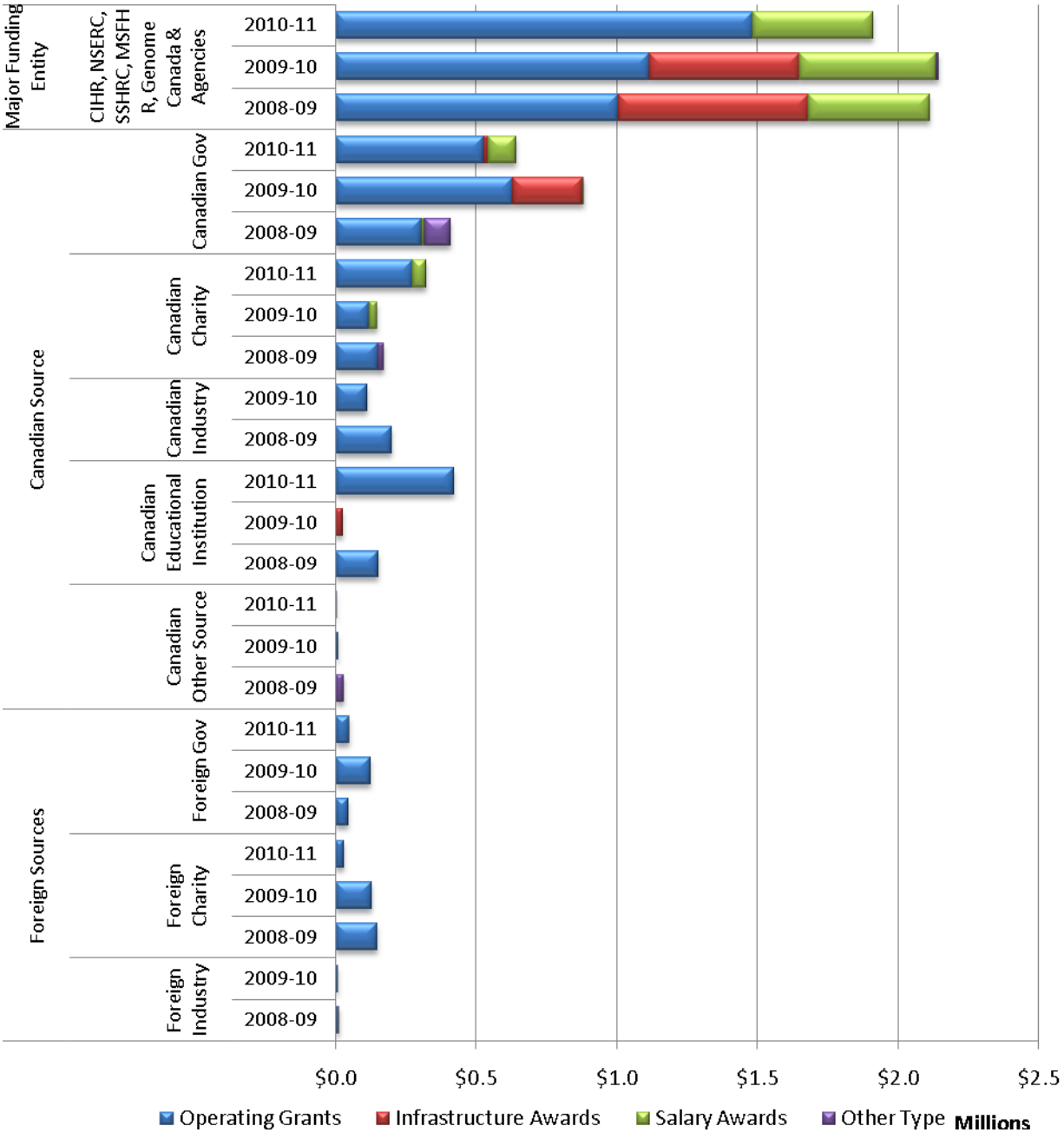
In FY 2010/11, researchers associated with BCMHARI were awarded a total of $3,374,989 (down $194,716 from 2009/10) in research funding. This reduction in funding is largely attributable to a 5-year MSFHR infrastructure award that ended in FY 2009-10. The amount awarded as Operating Grants ($2,782,404) and Infrastructure Awards ($15,959) in FY 2010-11, make up 83% of total funding received. A breakdown of funding types and subtypes can be found in Figure 31.

Figure 31
BCMHARI Research Funding by Funding Type and Sub-type



The top two funding categories are Major Canadian Funding Entity (56.7%) and Other Canadian Government (19.0%). Figure 32 details the major funding categories by funding type.

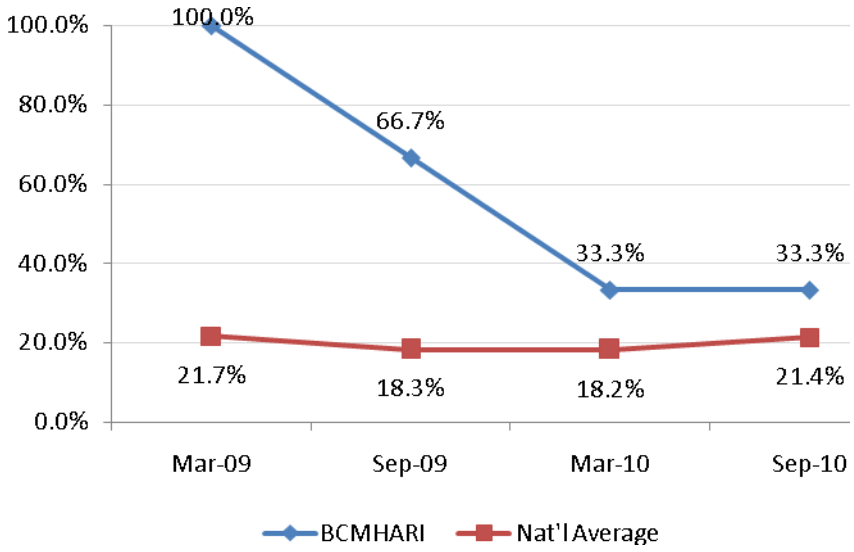
Figure 32
Total BCMHARI Research Funding by Funding Source and Type



BCMHARI has demonstrated success in recent CIHR operating grant competitions, exceeding the national average in the March and September operating competitions for both FY 2009 and 2010. Figure 33 below shows competition success rates. It should be noted that although the overall success rates decreased in FY 2010-11, there were more applications submitted and approved in FY 2010-11 than in FY 2009-10, and the success rates continued to exceed the national average. In fact, total funding from CIHR increased by 35% in FY 2010-11 over the previous year.

Figure 33

BCMHARI's CIHR Operating Grant Application Success Rate



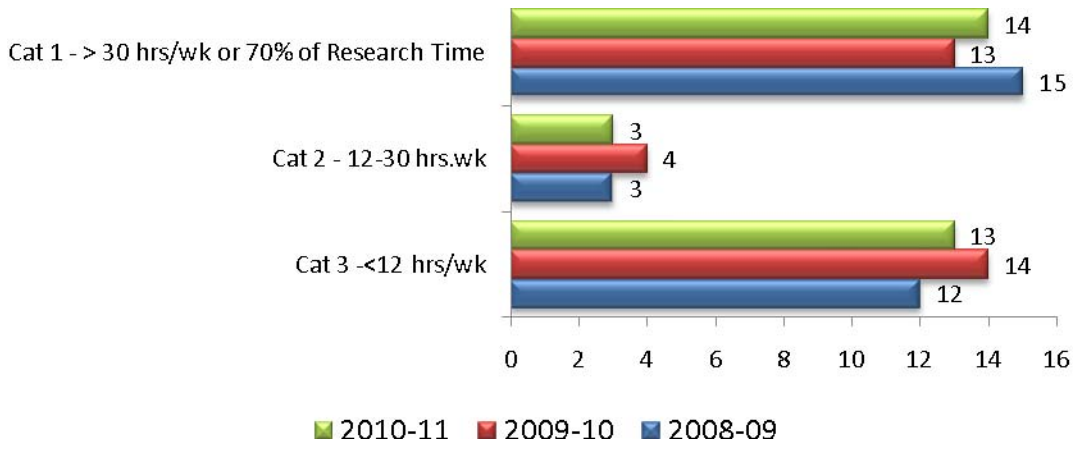
Building Research Capacity

BCMHARI is attracting nationally and internationally recognized researchers to its world class research facility, where unique opportunities exist for clinical and research training, as well as for collaboration with other research groups on the Children's & Women's Health Centre of British Columbia (C&W) campus. Situated on the third floor of the recently developed Translational Research Building, 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, postdoctoral fellows, graduate students, research assistants, and technicians supporting the research enterprise at BCMHARI, many clinicians and front line staff also participate in research programs.

BCMHARI has a total of 30 researchers in 2010-11, with 14 having greater than 30 hours or 70% protected research time per week (Figure 34).

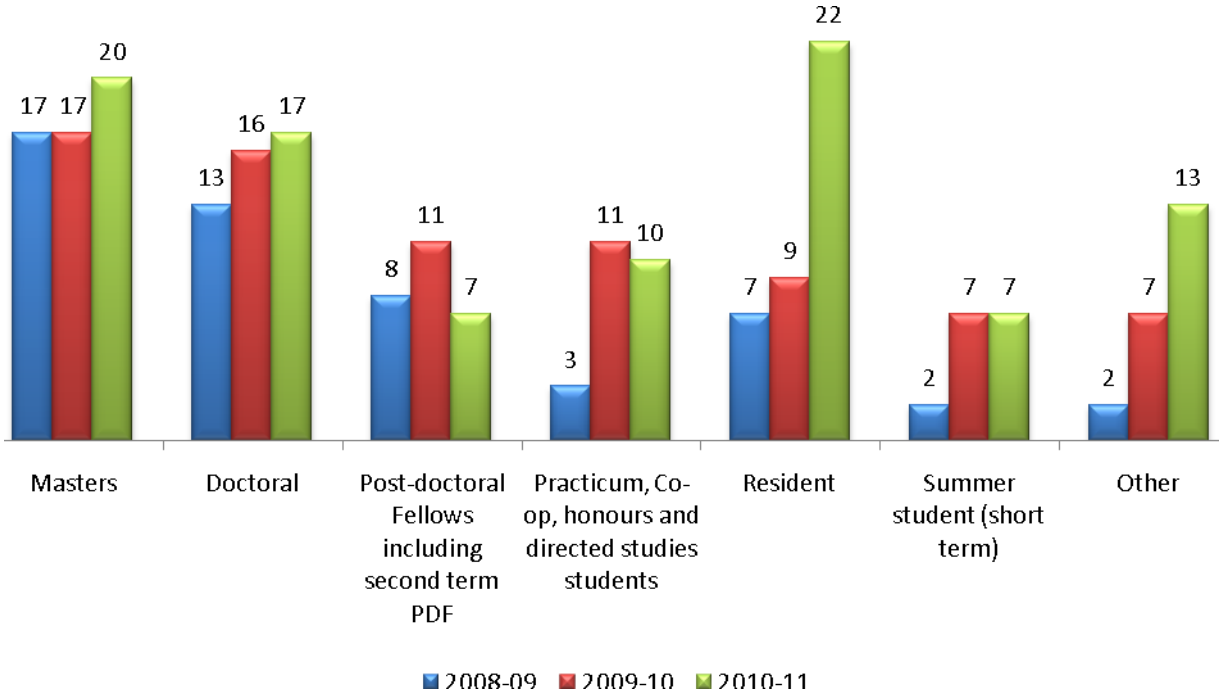
Figure 34

Total Number of BCMHARI Researchers by Category



During FY 2010-11, BCMHARI researchers provided training and supervision to a total of 96 trainees (up by 18 trainees from 2009/10). The largest increase was seen in the Resident category, from 9 in FY 2009-10 to 22 in FY 2010-11. As BCMHARI is in a fast growing phase of its life cycle, large increases are expected. See Figure 35 for numbers of trainees by type.

Figure 35
Total Number of BCMHARI Trainees by Category



Advancing Health and Policy Benefits

There were four BCMHARI clinical trials active during FY 2010/11; over the course of the fiscal year, one of these clinical trials closed. Expected local subject enrolment (for the term of the four studies) was 395. As of March 31, 2011, total subject enrolment was 322, with 67 of these enrolments taking place between April 1, 2010 and March 31, 2011 (see Table 9).

Table 9
BCMHARI Clinical Trials

	09-10	10-11
Total Number of Clinical Trials active during the FY	4	4

Guideline, drug, diagnostic agent or device adopted or approved in 2010/11as a result of research driven by PHSA researchers	**Benefits to patients, population health, and/or health system sustainability of the items identified**
Optimizing Pharmacological Treatment for People with Psychotic Disorders: A Framework for British Columbia. Co-authored by William G. Honer, MD and Ric M. Procyshyn, PhD, PharmD	Report submitted to the BC Ministry of Health Services on December 23, 2010. This framework will be implemented province-wide by the Ministry to guide better care from GP's and Mental Health Teams for the most severely ill patients with psychotic illness.

Status of the Trial as of March 31 in the FY:		
Total Number of Active Trials	3	3
Total Number of Trials that closed during FY	1	1
Enrolment Numbers:		
Expected Local Subject Enrolment (for the term of the study)	403	395
Total Subject enrolment to March 31 in the FY	277	322
Total Subject enrolment during the period April 1 to March 31 during FY	82	67

Table 10 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2010-11 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 10
BCMHARI Outcomes Survey Responses

Individualized Metacognitive Training for Schizophrenia. New cognitive bias training programs to increase awareness of the cognitive biases that may underlie delusions and help patients counter these biases.	Reduction of frequency and severity of positive symptoms of schizophrenia, specifically, delusions. A number of care teams in the Lower Mainland are currently offering this program to their clients. MCT is available free of charge to any health professional running support groups for people with schizophrenia and psychosis. Information, materials and program modules can be accessed through the University Medical Centre Hamburg-Eppendorf (www.uke.de/mkt).
Canadian ADHD Practice Guidelines (CAP Guidelines) 3rd Edition. Co-Edited by Margaret Weiss, MD http://www.caddra.ca	Guidelines facilitate diagnosis and treatment of ADHD throughout the life cycle in primary care. The Guidelines are used globally and are available in English and French. They support diagnosis and treatment in real-life conditions of practice where resources are limited and empower patients to make informed choices in a collaborative process of care.

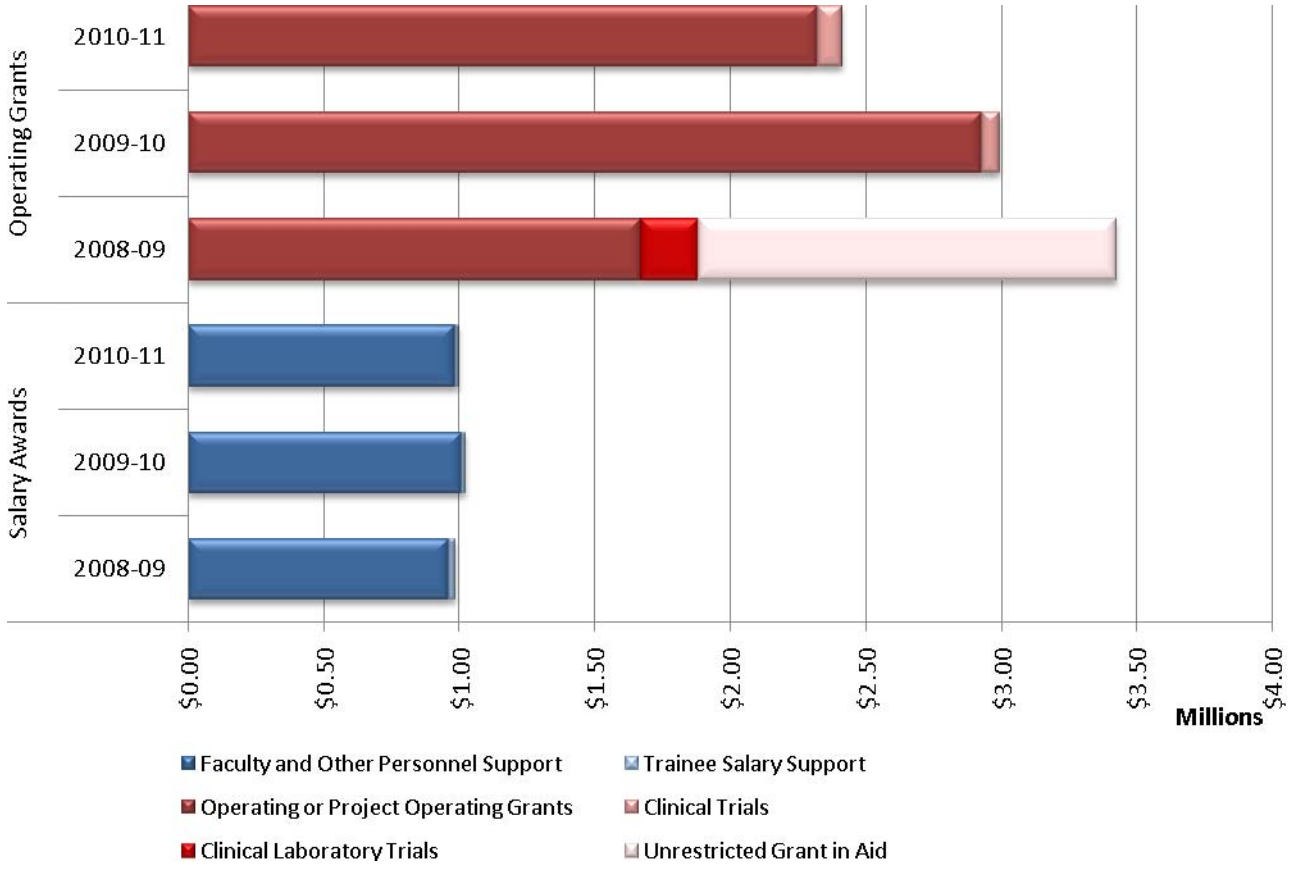
BC Centre for Disease Control/UBC Centre for Disease Control (BCCDC/UBC CDC)

Producing and Advancing Knowledge

In FY 2010/11, researchers affiliated with BCCDC/UBC CDC were awarded a total of $3,412,744 (down $604,888 from 2009/10) in research funding. The amount awarded as Operating Grants ($2,413,453) makes up 71% of total awards. A breakdown of funding types and subtypes can be found in Figure 36. Because of its public and population health mandate, research at BC CDC is very much embedded within its clinical mandate and, as such, is also supported by operating funding to a significant degree.

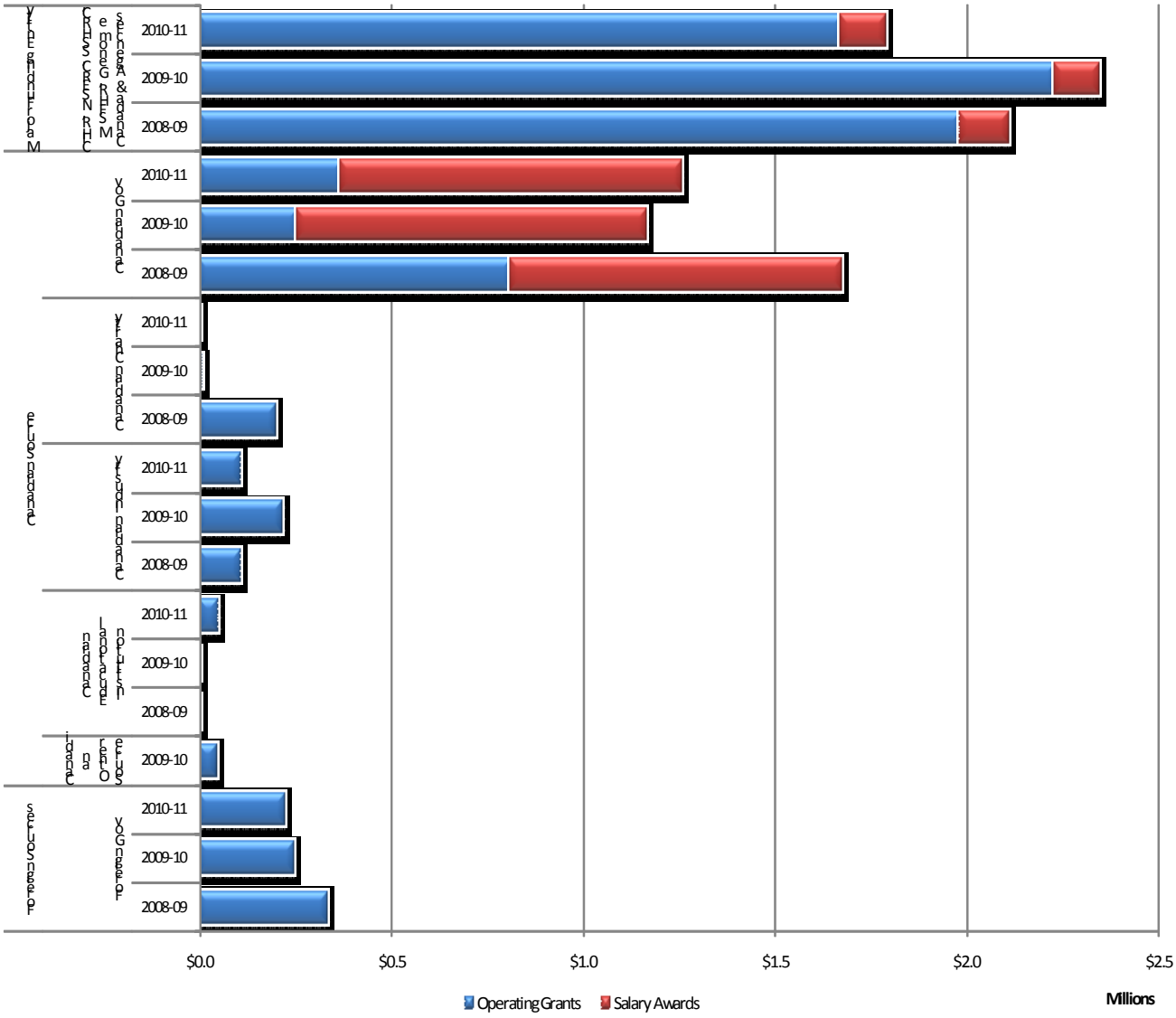
Figure 36

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



The top two funding categories are Major Canadian Funding Entity (52.3%) and Other Canadian Government (36.8%). Figure 37 details the major funding categories by funding type. A complete list of funding sources is detailed in Appendix 8.

Figure 37
Total BCCDC/UBC CDC Research Funding by Funding Source and Type

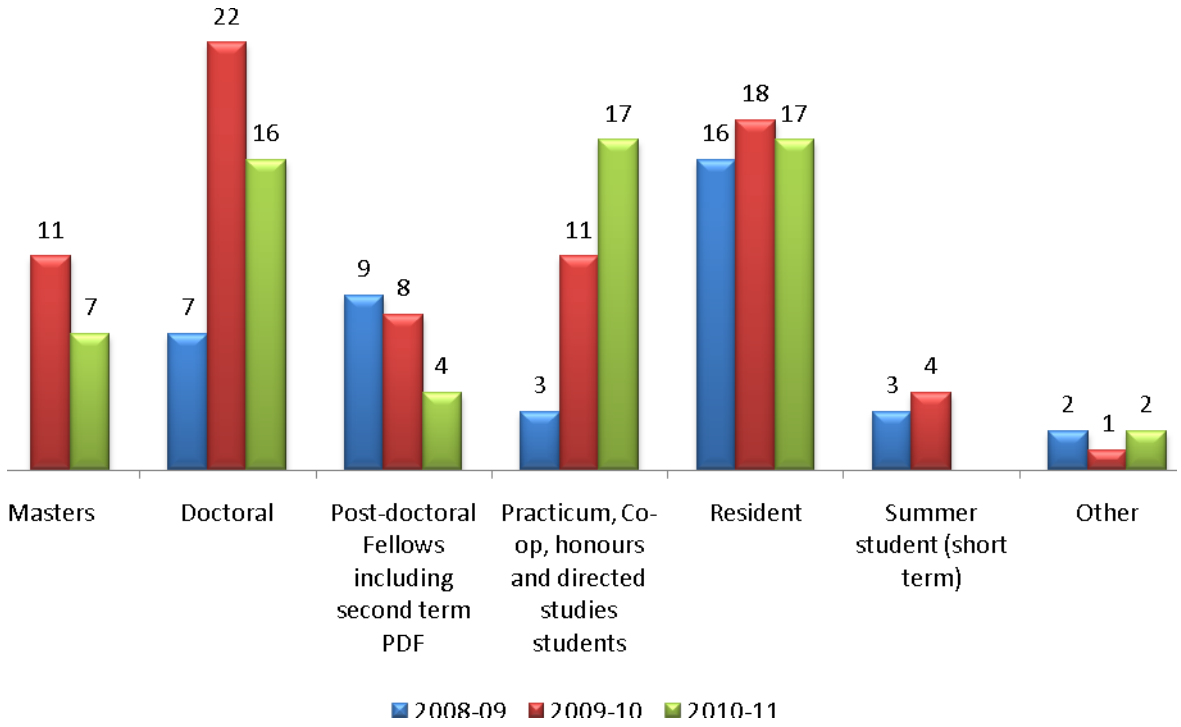


Building Research Capacity

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 (up 6 from 2009/10) meeting this definition in FY 2010-11.

During FY 2010-11, BCCDC/UBC CDC researchers provided training and supervision to a total of 63 (down 12 from 2009/10) trainees.

Figure 38
Total Number of BCCDC/UBC CDC Trainees by Type



Advancing Health and Policy Benefits

Table 11 reflects a sample of key guidelines, drugs, diagnostic agents or devices adopted or approved in FY 2010-11 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 11
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**
Updated CD control guidelines for measles and mumps posted on www.bccdc.ca which incorporate findings from the investigation of BC outbreaks of these diseases and research conducted in the context of these outbreaks; for instance mumps shedding study.	BC patients will be managed on disease risks identified in British Columbia related to the recognized epidemiology of vaccine preventable diseases which points to vulnerability in specific age groups. For mumps shedding, BC guidelines will incorporate recognition of shedding beyond 5 days; national guidelines have been driven by pragmatic considerations from Novia Scotia outbreak experience in which cases among young adults presented challenges to the 9 day isolation period, with reduction to 5 days, which fails to recognize the duration of shedding.
Site in a study looking at the use of long acting rifamycins funded by CDC Atlanta. Recent publication that source suggest its use in short treatments from latent TB infection	Easier protocols likely will increase the acceptance of treatment for latent infection and lessen future number of active cases.
Implemented faster Polymerase Chain Reaction (PCR) assay for agents of community acquired pneumonia.	Improved patient care where a pathogen that is difficult to detect in routine laboratories can now be identified and the patient treated with appropriate antibiotics.
Implemented better 16S and ITS bacterial DNA sequencing for identification of fastidious and difficult to identify organisms by conventional methods.	Improves TAT and allows more timely diagnosis that would affect patient care.
Rapid implementation of fast Polymerase Chain Reaction (PCR) for the detection of new highly antibiotic resistant health care associated infection (carbapenemase resistant enterobacteriaceae such as NDM-1, KPC)	Rapid response to new emerging pathogen with validation and implementation of a new and fast DNA based test helps prevent further spread with decreased costs to health care system.
Measles, Mumps and West Nile Virus in-house testing redesigned for the ABI 7500 platform enabling multiple assays to be run at the same time because of shared reagents and cycling parameters	This is cost saving and provides improved TATs.
Herpes simplex testing culture based detection methodology changed to a Polymerase Chain Reaction (PCR)	Improved test sensitivity (by about 30%) and saves money.
Evaluating cost/ benefit of different diagnostic approaches to detecting Helicobacter pylori infections resulted in a change to provincial clinical diagnostic guidelines; follow up study underway.	Potential savings to the health care system after implementing the new guidelines.
After a business case done with BCCDC TB Control resulted in implementation of a better test for latent tuberculosis – Interferon-Gamma Release Assay (IGRA) for the province, further studies underway partnering with hospital microbiologists on the usefulness of this more specific test in special populations.	Improvement on less specific (more false positive results) TB Skin Test and results in fewer visits to health care providers (TST requires 2 visits, IGRA requires 1). As well IGRA improves patient safety as less potentially toxic drugs are used with fewer side effects and less drug costs. Criteria for enhanced use underway.

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
Development and implementation of C gattii fungal (emerging fungal pathogen) fingerprinting (MLST typing) allows monitoring spread of virulent strains (VGIIc) currently circulating in Oregon area.	Better monitoring allows improved public health communications with awareness of this unusual pathogen's presentation, more rapid detection and better patient outcomes.
Using new tools of genomics to study microbes in the laboratory (such as Mycobacterium tuberculoses, the cause of TB) has shown that they can resolve questions of how these infections are spread more accurately.	Genomics work on TB isolates showed that current molecular lab tools did not help the way TB was spreading in this outbreak. New genomic microbiology tools allow public health to intervene to stop further transmission more rapidly, to prevent disease and save money.
Led metagenomics approach in an investigation to determine the etiology of a large Vancouver Island respiratory outbreak.	Faster, more accurate response to outbreaks with prevention of spread thus decreasing costs to the health care system.
Led project to develop in-house real-time Polymerase Chain Reaction (PCR) for TB and for whooping Cough (Bordetalla pertussis)	This saves money, with faster turnaround time, improves sensitivity for serious infections and improves patient care.
Our findings of TIV-increased pandemic H1N1 risk, identified and confirmed in a series of five studies across Canada in the summer 2009.	The findings were communicated to public health authorities nationally and internationally and had a global impact with broad media coverage and a direct influence on seasonal and pandemic vaccine roll-out decisions in the fall of 2010 in several provinces of Canada.
Administered age-related pandemic H1N1 sero-survey to evaluate initial and residual susceptibility to the pandemic H1N1 virus. These sero-surveys showed that in BC a large proportion of the population, especially children, was initially susceptible but subsequently highly protected following the pandemic wave and mass immunization campaign. In particular we found that pre-school children who had previously been considered a special risk group during the 2009 pandemic were no longer at heightened risk in the fall 2010 and thus did not require special targeting of vaccine for 2010.	These results were presented to the BC CD Policy Committee during the summer 2010 and directly influenced that committee's decisions around targeting of the 2010-11 seasonal vaccine and also informed the fall 2010 immunization campaign (published in CMAJ in 2010 and Journal of Infectious Diseases in 2011)
A BCCDC-led study across five clinical trial sites nationally in three provinces (BC, Quebec, Nova Scotia) showed that giving a full-dose of TIV to infants substantially improved their antibody responses without increasing reactogenicity. This randomized controlled clinical trial of trivalent inactivated influenza vaccine (TIV) dose response in infants and toddlers (acronym TITRE: TIV Infant-Toddler Response Evaluation) has resulted in major change to a decades-old policy of under-dosing young children with influenza vaccine in North America. Historically, the recommendation has been to cut the dose of influenza vaccine given to young children in half because of fears related to febrile reactions. But that	Those findings were presented to Canada's National Advisory Committee on Immunization, to the BC Communicable Disease Policy Committee and at the Vaccine Research Conference in Baltimore in May 2010. The paper describing these findings will appear in publication in the journal Pediatrics in August 2011. Based on the TITRE trial, the National Advisory Committee on Immunization has recommended that young children should receive the same full dose of TIV as all other age groups, thereby reversing a decades-old policy. TITRE investigators have also followed this cohort of children forward in subsequent seasons to explore unique aspects of influenza B cross-lineage responses (TITRE II/TITRE IIB); the follow-up findings have also been accepted for

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
recommendation was based on experience with earlier whole virus vaccines and was never re-evaluated with the introduction of safer split virus formulations in the 1980s.	publication in the Pediatric Infectious Disease Journal in the fall, 2011.
Influenced policy in our analysis of the "number needed to vaccinate" (NNV) for the broadly promoted parental perussis cocoon immunization program. Despite broad promotion of the cocoon program, NO ONE had yet incorporated a consideration of the NNV. By deriving the NNV we showed this approach to be highly inefficient for the prevention of infant pertussis and highlighted the crucial need to incorporate LOCAL epidemiology into any consideration of its implementation.	Like our previous NNV calculation for the rabies post-exposure prophlyaxis (RPEP) recommendation around bedroom exposures to bats (published in Clinical Infectious Diseases in 2009), this simple yet previously unconsidered aspect of pertussis immunization program analysis will have generated substantial savings to the health care system by preventing investment in a program unlikely to yield much public health benefit. The pertussis NNV analysis is also currently under peer-review with a journal.
This flu season, Dr. Danuta Skowronski's sentinel influenza program utilized viral gene sequencing and phylogenetic analysis to a greater degree than ever before.	By sequencing and analyzing changes in the virus in near real-time in addition to the regular sentinel activities, we were able to more rapidly arrive at a conclusion about how the flu virus was behaving across Canada this year.

Women's Health Research Institute (WHRI)

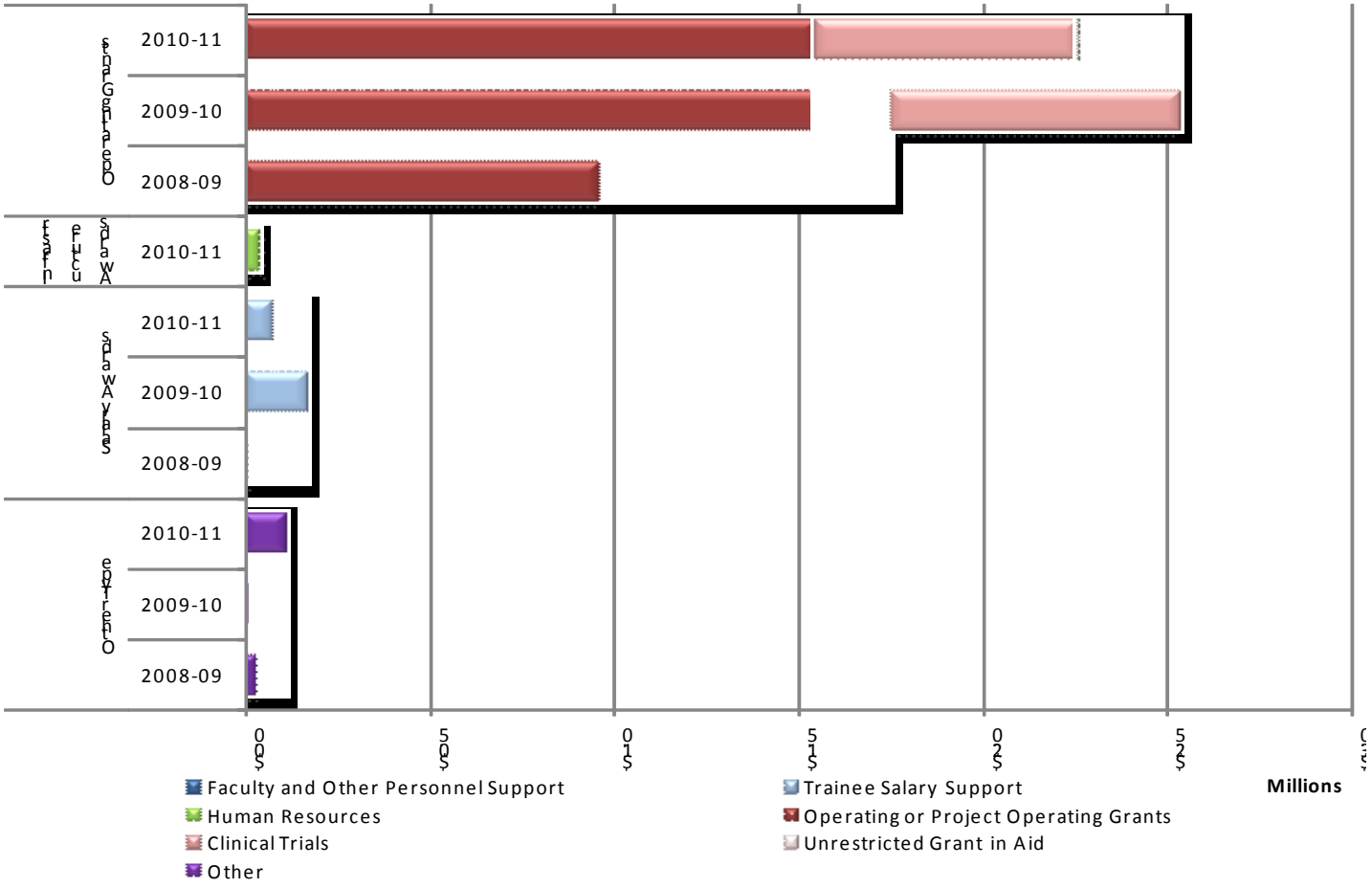
Producing and Advancing Knowledge

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 2010-11, researchers affiliated with WHRI were awarded a total of $2,494,994 in research funding. The amount awarded as Operating Grants ($2,267,129) makes up 91% of total awards. A breakdown of funding types and subtypes can be found in Figure 39. 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 agreements is in place to allocate attribution of shared investigator grants. As a result, total research funding below is understated.

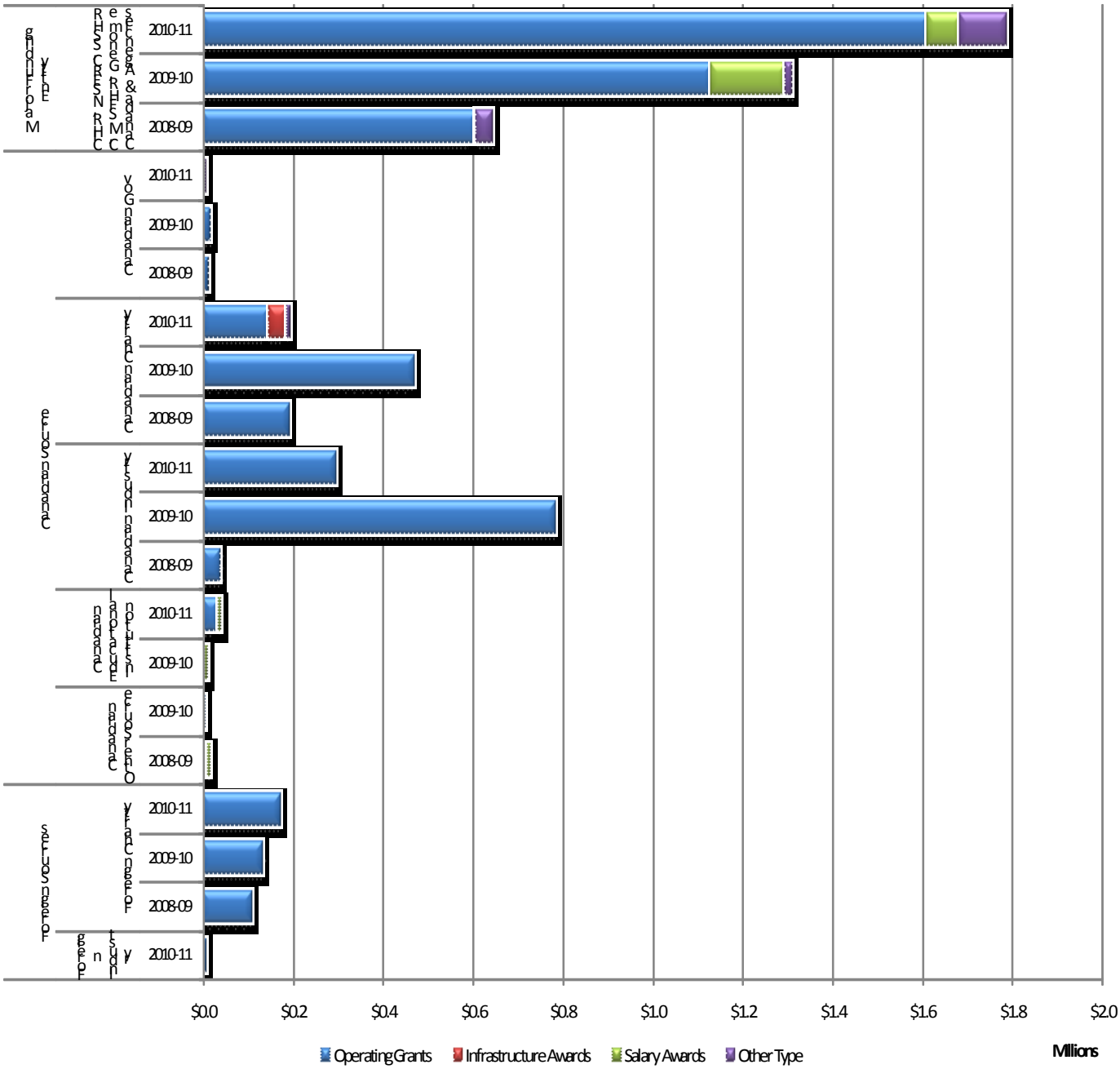
Figure 39

Total WHRI Research Funding by Funding Type and Sub-type



In 2010/11, the top two funding categories are Major Canadian Funding Entity (71.5%) and Canadian Industry (11.8%). Figure 40 details the major funding categories by funding type. A complete list of funding sources is detailed in Appendix 9.

Figure 40
Total WHRI Research Funding by Funding Source and Type

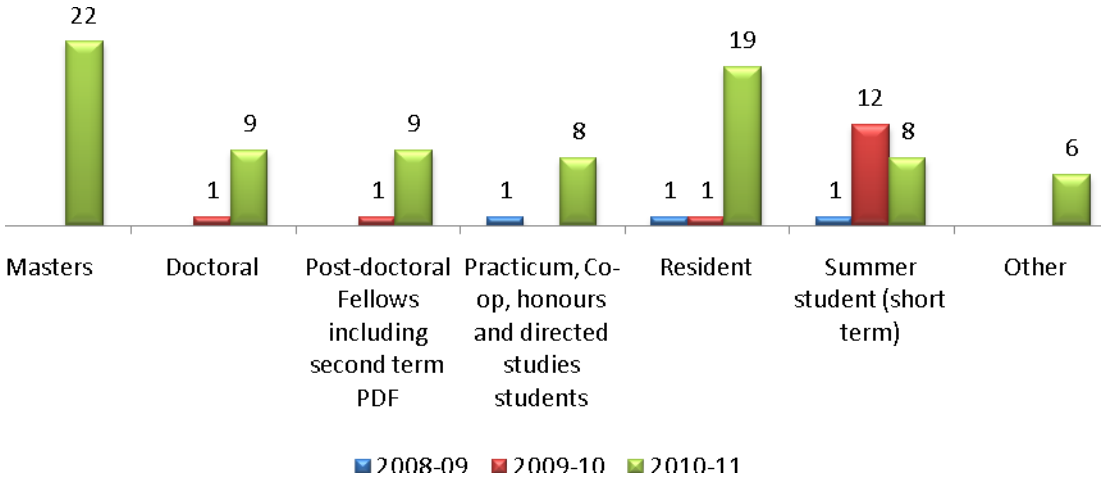


WHRI has demonstrated success in recent CIHR operating grant competitions, exceeding the national average in the September 2009 and March 2010 competitions. This data is not graphically represented due to small sample size; one (1) application submitted and approved in FY 2009 and three (3) applications submitted and one (1) approval in FY 2010. Members of the WHRI apply for grant competitions that are offered by a variety of granting agencies. While CIHR Operating Grant competitions provide a consistent measure across PHSA research entities for comparison, in FY 2010-11 WHRI submitted 28 applications to various funding bodies and received approval for 23, resulting in an 82% success rate.

Building Research Capacity

In FY 2010-11, WHRI researchers provided training and supervision to a total of 81 trainees (up 66 from 2009/010) – a 440% increase over the previous year. In FY 2010/2011, a team of WHRI investigators led by Dr. Money received a CIHR Emerging Team Grant of $2.5 million over 5 years to undertake the Human Vaginal Microbiome Project. Success with large team grants of this nature attract the best and brightest trainees and enable the WHRI to support increasing numbers of trainees.

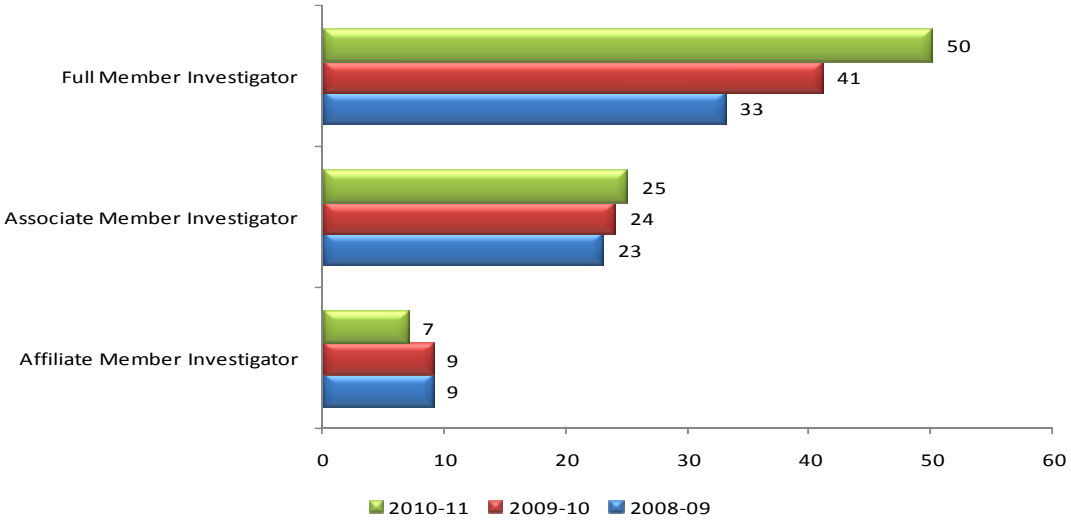
Figure 41
Total Number of WHRI Trainees by Type



In an effort to show WHRI's activities, their membership statistics are shown (see Figure 42). In 2010/11, the number of full member investigators is up 9 from the previous year. 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 42
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 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 12).

Table 12
WHRI Clinical Trials

	09-10	10-11
Total Number of Clinical Trials active during FY	20	25
Status of the Trial as of March 31 in the FY:		
Total Number of Active Trials	15	18
Total Number of Trials that closed during FY	5	7
Enrolment Numbers:		
Expected Local Subject Enrolment (for the term of the study)	2,287	1,981
Total Subject enrolment to March 31 in FY	925	1,171
Total Subject enrolment during the period April 1 to March 31 in the FY	351	916

Table 13 reflects a sample of key guidelines, drugs, diagnostic agents, or devices adopted or approved in FY 2010-11 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 13
WHRI Outcomes

Guideline, drug, diagnostic agent, or device adopted or approved in 2010/2011 as a result of research driven by PHSA researchers	Benefits to patients, population health, and/or health system sustainability of the items identified
BC HPV research group supported by the WHRI led the multi-institutional team whose research determined that 2 doses of the quadrivalent HPV vaccine provides the same protection as 3 doses. The immunization schedule for the BC school-based program was changed to 2 doses.	Reduced costs to the health care system. Reduced interventions for patients.
National clinical guideline published: Antibiotic Prophylaxis in Obstetric Procedures	Reduced costs to health care system of administering unnecessary antibiotics. Reduced harm to patients of inappropriately utilized antibiotic prophylaxis.
BC HPV research group supported by the WHRI published a clinical guideline: Cervical Cancer Prevention in Low-Resource Settings	Expectation of improvement in population health through increased prevention and detection rates of HPV.
National clinical guideline published: Cytomegalovirus (CMV) Infection in Pregnancy	Expectation of decreased chance of an infant born with severe CMV disease due to more effective diagnosis and management of CMV in pregnancy.
Participated in the development of new guidelines for sepsis management implemented at BCWH resulting in simpler, protocol based approach to sepsis with standing orders.	Increased likelihood of recognition of severe sepsis in pregnant or post partum women. Lower morbidity, length of stay and decreased risk of death from sepsis.
National clinical guideline published: Genetic Considerations for a Woman's Preconception Evaluation	Anticipated better outcomes for patients through improved risk-benefit assessment in preconception counseling; enhanced informed decision-making.
National clinical guideline published: Oral Contraceptives and the Risk of Venous Thromboembolism: An Update	Reduced costs to the health care system through avoidance of unplanned pregnancies Reduced harm to patients through lower rates of thromboembolism.
National clinical guideline published: Endometriosis: Diagnosis and Management	Expectation of improved care for women with pain and infertility associated with endometriosis.
National clinical guideline published: Adhesion Prevention in Gynaecological Surgery	Expectation of improved care for women undergoing gynaecological surgery through optimization of surgical procedure.
National clinical guideline published: Asymptomatic Endometrial Thickening	Reduced costs to health care system by eliminating unnecessary interventions. Reduced interventions for patients.
National clinical guideline published: Guidelines for the Evaluation and Management of Recurrent Urinary Incontinence Following Pelvic Floor Surgery	Reduced frequencies of invasive procedures expected to lower costs to health care system and improve outcomes for patients.
National clinical guideline published: Recurrent Urinary Tract Infection	Optimization of care for women with recurrent urinary tract infections is expected to improve outcomes for patients.
National clinical guideline published: Transvaginal Mesh Procedures for Pelvic Organ Prolapse	Emphasis on a thorough process of informed consent is expected to improve outcomes for women.

Registries & Datasets

Advancing Health and Policy Benefits

Data stewards for a total of nine PHSA registries or data sets were invited to participate in a survey designed to assess registry/dataset purpose, access statistics, required resources, nature of research activities, and research benefits. 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.

In addition to the below Registries, BC Ambulance 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 Table 14 for FY 2010-11 access requests statistics for these data sets. BC Ambulance is mainly a health service delivery agency whose mandate includes the production of knowledge in the patient populations they serve.

Table 14

Dataset - FY 2010/11	# of Requests	# of Approvals
Cardiac Clinical Trial	15	12
Trauma Clinical Trial	12	12
Cardiac Arrest Registry	2	2
Trauma Registry	0	0

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.
Cervical Cancer Screening Database	Lab information system for gyne cytology reporting
PREDICT	Acts as a source of information for research involving BCCA patients
PROMIS (BC Kidney Disease Registry) / TADIS (Transplant and Donor Information System)	Monitors program effectiveness. Supports patient care.
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 43. Access requests are summarized in Figure 44. For examples of the types of research questions posed by researchers using the above data sets, please see Appendix 10.

Figure 43

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

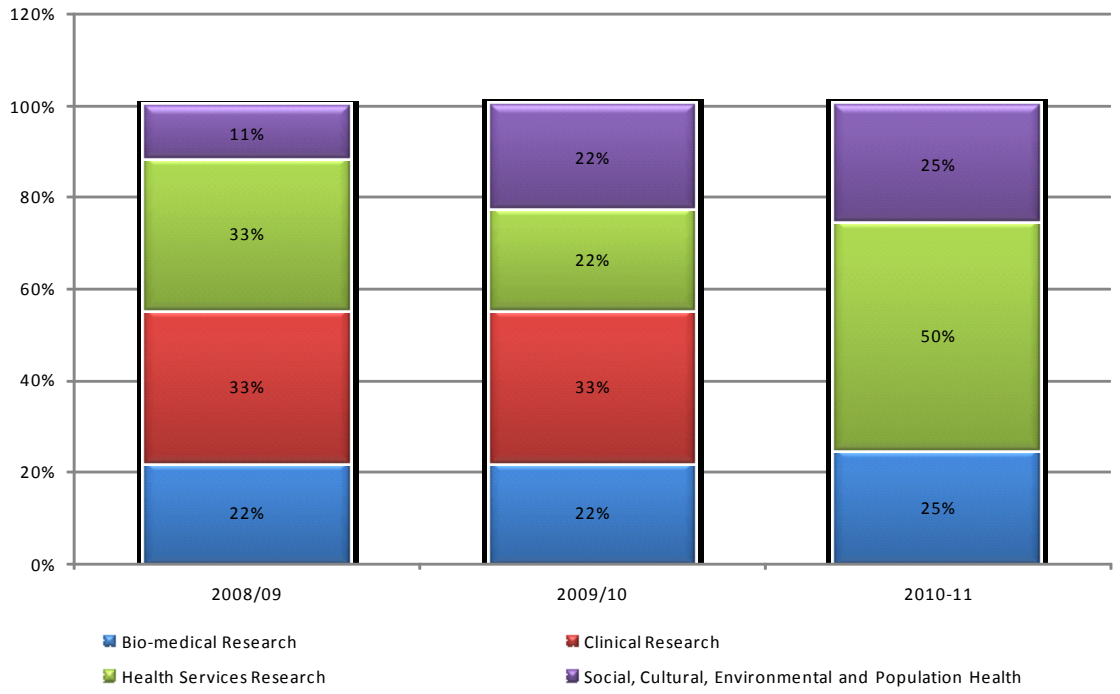
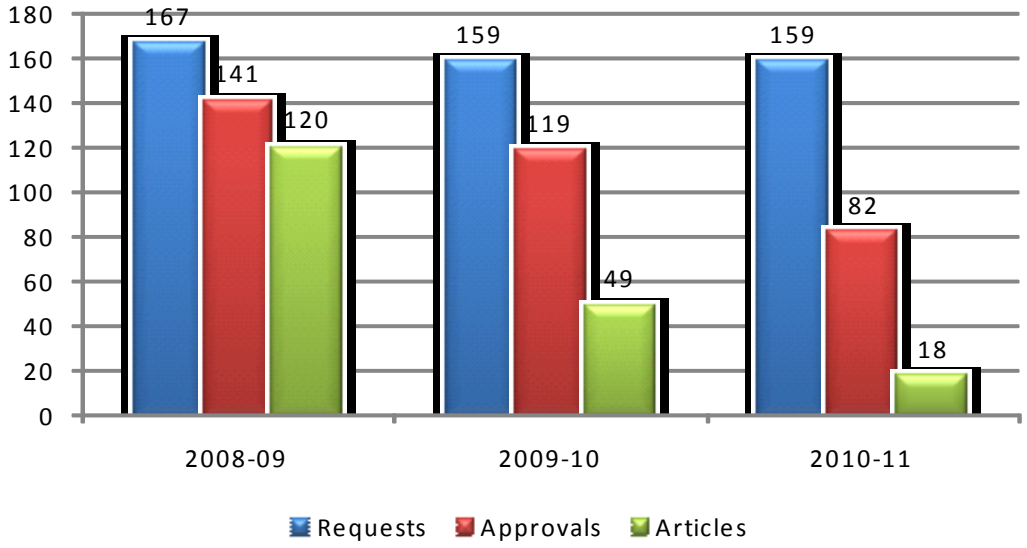


Figure 44

Research Requests and Approvals from Registry Research Resources by Fiscal Year



Research Benefits

The total number of scholarly articles that were published during FY 2010-11 that resulted from, or reported on, access to data from PHSA registries or datasets was 18. This 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 2010-11 that resulted from research based on the registry or dataset is excerpted below.

BC Ambulance

- BCAS participates in a joint Canada/US pre-hospital cardiac arrest and major trauma research network. The network maintains a registry of cardiac arrest and life threatening trauma patients and also conducts interventional trials in these two pre-hospital patient populations. In the fiscal year 2009/2010, BCAS investigators were involved in 3 cardiac arrest, and one traumatic injury studies that used these data. Additionally, 4 RCT being conducted in this research network completed patient enrolment and began data analysis. Two manuscripts were published for the trauma trials, while analysis of the cardiac arrest studies has been delayed. The patients that BCAS contributed to the registries and the RCTs lead to an additional 13 publications, which did not include a BCAS investigator.

BC Perinatal Database Registry (Perinatal Health Program)

- System planning - Research on maternal and newborn outcomes based on service delivery level provides a basis for system planning in primary maternity care. Patient outcomes - Data on rise in caesarean delivery rates stimulated practice and policy changes in management of labour induction, counseling for CD and breech deliveries, Best Birth Clinics at BCW.

PREDICT

- PREDICT has engaged 1215 patients in research between April 1, 2010 and March 31.2011. As a centre-wide program it is driven by all staff including a full time research intern dedicated to the project. It is important to note that the number of articles published that resulted from research based on PREDICT is unknown rather than zero.

Surgical Patient Registry

- Implementation of the provincial target time frames for surgery wait times.

Tumour Tissue Repository

- The first basic and translational research data is now being generated from basic research studies that have accessed the TTR since fall 2008 and has led to scholarly publications. However it is too early in the life of a biobank (<6 yrs) to have supported clinical type research studies that included outcomes data and so to have a direct impact on patient care (as median outcome data on cases is <5yrs).

Appendix 1 - 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.

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 2 - Research Metrics Working Group Membership*

Dug Andrusiek
Director of Research, BC Ambulance Service

Ellen Chesney
Chief Administrative Officer - Research, PHSA

Ognjenka Djurdjev
Corporate Director, Performance Measurement & Reporting, PHSA

Jennifer Gardy
Bioinformatician
BCCDC/UBC

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

Jane Hood
Director, Research & Knowledge Development, BC Mental Health and Addictions Research Institute (BCMHARI)

Andrew Kmetic
Provincial Director, Data Services, Evaluation & Research, PHSA Cardiac Registry

Karin Jackson
Manager, Strategic Information Management team, BC Mental Health & Addictions Services

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

Allison Rintoul
Director, Research & Education Services, Child & Family Research Institute

Beth Palacios
Consultant, Performance Measurement & Reporting, PHSA

Deirdre Roger
RISe Project Manager, Treasury, Restricted Funds and Asset Management, PHSA Finance

Robyn Roscoe
Head, Strategic Planning and Project Management, Genome Sciences Centre (GSC), BC Cancer Agency

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

*As of September, 2011

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 both with and without Major CFI Infrastructure Awards (see 2d below).
***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, CFRI, BCMHARI and WHRI.
***Metric 1d –** Total # of Publications	Added in FY 10-11; Total number (of publications, not authors) published within applicable fiscal year meeting the following criteria: Book, book chapter, peer-reviewed publication inclusive of published journal articles, case reports, essays, literature reviews, and e-journals. Excluded = abstracts, editorials, summaries, letters to the Editor, epubs, in press and submitted publications. The total number represents the agency total for publications where agencies 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.
***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.)
***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 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	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 fromyear to year and are no longer reported by

Glossary

Term	Description
(Revised FY 10-11)	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. <u>Royalty, equity liquidated and licensee fees</u> When the UILO licenses technology to a company, the terms of the license typically includes a requirement to pay a % royalty on product sales, an upfront license fee and an annual license maintenance fee. The UILO may also negotiate an equity component (company stock) as part of the license agreement. Under the licensing scenario, the University still owns the technology but is granting a license to a third party. <u>Option Fees</u> This relates to the scenario when a company desires an option on a technology (essentially reserving/holding the technology). These are usually short-term contracts that have a modest option fee. <u>Technology Assignment</u> This relates to the scenario when a company wishes to take ownership of the technology and in return pays an Assignment fee.
Funding Type Categories (columns)	
Funding Types/Grant Types	The columns on worksheet 1ab, 2b that correspond to the funding types agreed to by the Research Metrics Working Group on July 22, 2009 and revised at the working group's direction in subsequent fiscal years.
Salary Awards	
Faculty and other personnel support	Dollar amount for FY for supported faculty salary awards including chairs.
Trainee salary support	Dollar amount for FY for supported trainee salary awards including trainee research allowances.
Infrastructure Awards	
Human Resources	Dollar amount for FY for Human Resource Infrastructure including Michael Smith Foundation for Health Research (MSFHR) - team start-up, team, research units, platforms, networks and institutional infrastructure, CFI Infrastructure Operating Fund (IOF) awards.
Capital, Equipment, Construction	Dollar amount for FY for capital, equipment, or construction awards including Canada Foundation for Innovation (CFI), BC Knowledge Development Fund (BCKDF), matched sources (charities, industry) and other large equipment grants.

Glossary

Term	Description
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 FY10-11	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, behavioural 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 Laboratory Trials (4a)	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).
Unrestricted /Grant in Aid	Dollar amount for FY for Unrestricted or 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)
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.

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.
Funding Source Categories (rows)	
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.
CIHR and its institutes	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
NCIC/Canadian Cancer Society/CCSR	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.
(US) NIH and its institutes	US National Institutes of Health and its MANY subsidiary institutes, centres and offices as listed at http://www.nih.gov/icd/
NSERC	Natural Sciences and Engineering Research Council
SSHRC	Social Sciences and Humanities Research Council
Genome Canada and provincial Genome agencies	Genome Canada, and its regional centres: Genome BC, Genome Alberta, Ontario Genomics Institute, Genome Quebec, Genome Prairie, and Genome Atlantic
MSFHR	Michael Smith Foundation for Health Research (BC)
Canadian Industry	Canadian-based for-profit corporations

Glossary

Term	Description
Canadian Charity	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 Government	Provincial, municipal, territorial or federal governments and crown corporations in Canada
Foreign Industry	For-profit corporations headquartered outside Canada
Foreign Charity	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
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 Fellows including second term PDF	Full time post doctoral fellows whose primary focus is research (NOT clinical fellows)
Summer students (short term)	High school and or university students who are engaged in a short term program with the reporting agency for a limited period (e.g. over the summer, a few weeks)
Residents	MDs engaged in a residency program that may include a research rotation
Practicum, co-op, honors and directed studies students	High school and/or university students whose assignment to the reporting organization is according to a practicum, co-op, honours and/or directed studies program
Other Research Trainee Type	(Reporting organization to specify definition)
Research Trainees (rows)	
Do you Support These Types of Research Trainees	To be answered Yes or No for each Research Trainee Category listed above. Is used to indicate that a research entity does have Research Trainees of this type but has no data collection ability. This will distinguish between those with zero (0) Trainee types from those that have them but can't count them.
Total Head Count	Total number of research trainees of that type, not an FTE (Full Time Equivalent number).

Glossary

Term	Description
List of Researcher Name (columns and row)	
Category (modified to add Shared Membership sub-category under CFRI categories 1-3 in FY 2010-11)	A number one through five (MUST have one selected). Categories 1-4 are as described in the CFRI "Guide for Completing an Application for Membership" available online at http://www.cfri.ca/research_support/forms/membership.asp . These categories are based on a calculation of a given individual's research hours/week. Category 5 will be for those research entities/agencies who do not utilize the CFRI categories. If you utilize category 5, please indicate the definition that your research entity/agency uses to define Researchers. A shared membership sub-category available in 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
OTHER	
Fiscal Year 08-09 Fiscal Year 09-10 Fiscal Year 10-11	April 1, 2008 – March 31, 2009 April 1, 2009 – March 31, 2010 April 1, 2010 – March 31, 2011