



FY 2021-22

PHSA RESEARCH AND STUDENT EDUCATION

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PHSA Research and Academic Development Committee

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The following report is prepared for the Provincial Health Services Authority (PHSA) Board of Directors on an annual basis to present data related to the Framework for PHSA Research Metrics (see Appendix 2) and the Framework for PHSA Student Education Metrics (see Appendix 3). As an academic health sciences organization, PHSA works in close partnership with the University of British Columbia, BC Institute of Technology, Simon Fraser University, University of Victoria, University of Northern BC, and other BC educational institutions. BC Emergency Health Services works closely with the Justice Institute of BC.

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

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PHSA'S MEASURABLE COMMITMENT TO RESEARCH & EDUCATION

Introduction to PHSA's 5th Consolidated Summary Report

PHSA Research & Academic Development is pleased to present its fifth annual consolidated summary of PHSA research and student education metrics. This year's report provides integrated information relating to PHSA's academic health science mandate for research and student education, including the profound impact of COVID-19. This year's report includes:

- Dashboards that reflect, at a glance, quantitative metrics based on PHSA Board-approved performance indicator frameworks
- Narrative that highlights PHSA's academic health science mandate, and the impacts and outcomes being realized in research and student education
- PHSA program sections that identify the Top 3 research accomplishments by research entity (important achievements that may not be well reflected through quantitative metrics), present research and student education infographics (illustrating high level inputs and outputs), and detail research outcomes identified by PHSA research entities
- Examples of important research questions that are being answered through the rich data assets available in PHSA registries, and
- Information on COVID-19 research projects awarded to PHSA entities

PHSA is expected to conduct world-class research, and to deliver excellence in education and training.

This consolidated and integrated reporting approach communicates how research is driving patient and health system benefits, and how student education is preparing a high-performance health workforce for the future. While research, inquiry and learning take place across PHSA, this report relates activities associated with PHSA's five programs that have research institutes and that play a vital role in providing students with clinical practice education: BC Children's (BC Children's Research Institute), BC Women's (Women's Health Research Institute), BC Cancer (BC Cancer Research Institute), BC Mental Health & Substance Use Services (BC Mental Health & Substance Use Research Institute), and BC Centre for Disease Control (UBC Centre for Disease Control). This report also relates the essential training role of BC Emergency Health Services and the critical research role it plays in collaboration with non-PHSA researchers.

Detailed data for the PHSA Board-approved frameworks for research and student education metrics continue to be reported in the related supplementary reports that support operational decision-making and are available on the PHSA website: <http://www.phsa.ca/our-research/research-focus/research-education-metrics>

PHSA is one of Canada's largest academic health science organizations - organizations with an integrated mandate to deliver care, conduct research and train students. PHSA's provincial mandate strongly reinforces that role, specifying PHSA is "expected to conduct world-class research, and deliver excellence in education and training ... to support and underpin its ability to develop evidence-informed clinical policy and to deliver high quality provincial clinical services."

The following report illustrates PHSA's commitment to this critical role and the benefits that derive to patients, populations, and the BC health system.

PHSA RESEARCH METRICS

FISCAL YEAR SUMMARY - PHSA OVERALL

Indicator		Key Measure Description	FY 2019-20	FY 2020-21*	FY 2021-22
			Value	Value	Value
Producing & Advancing Knowledge	1a	Total Annual Grant Awards by Type (including Major CFI Infrastructure grants)	\$145,597,847	\$148,523,543	\$177,100,074
		Salary Awards	13,788,858	14,651,948	13,811,897
		Infrastructure Awards	7,011,184	4,717,341	8,077,745
		Operating Grants	119,979,796	125,818,541	155,130,637
		Other	4,818,009	3,335,713	79,795
		COVID-19 Research Funding (included in above categories)	NA	\$9,538,864	13,520,117
	1b	Total Annual Grant Awards by RISE Sector (including Major CFI infrastructure grants)			
		Government	66,778,795	84,988,757	76,344,423
		Non-Profit	60,676,760	47,325,166	76,328,230
	1c	CIHR Annual Grant Application Success Rate - PHSA Overall/ Nat'l			
Fall Project Grant		25.3%/15.7%	22.4%/19.0%	28.1%/26.0%	
1d	Total # of Publications w/ Program Author				
	BCCHR	1,060	1,117	1,284	
	BCCRI	744	776	761	
	WHRI	752	950	1,006	
	BCCDC	161	243	301	
	BCMHSUS	127	133	151	
Building Research Capacity	2a	Total # of Research Trainees	2,601	2,663	2,917
	2c	Total # of Researchers (excluding Category 3 – Affiliate Investigator)	827.5	952	940.5
	2e	Research Support Fund Grants (Tri-Council only)	\$4,063,179	\$4,102,759	\$4,303,669
Achieving Economic Benefits & Innovation	3a	# of Invention Disclosures	32	40	35
		# of Provisional Patent Applications Filed	24	18	17
		# of PCT Applications Filed	9	7	8
		# of Patents Filed/Issued	11/21	20/21	115/30
	3b	# Active License Agreements	123	125	130
		# of Spin-off Companies	17	18	19
	IP related revenue – Realized Revenue				
	BCCRI	\$432,697	\$1,117,445	\$2,210,216	
Advancing Health & Policy Benefits	4a	Clinical Trials (including Non-PHSA PIs utilizing PHSA facilities and resources)			
		# active trials at the end of the FY	656	657	695
	Cumulative Subject Enrollment-end of FY	21,400	20,591	36,287	
	4b	Registries as Research Resources			
# of Research Requests/Approvals	236/226	208/193	273/257		

*FY 20-21 Award Totals are re-stated to include the Canada Research Continuity Emergency Fund (CRCEF) amounts

PHSA STUDENT EDUCATION METRICS

FISCAL YEAR SUMMARY - PHSA OVERALL

Indicator		Key Measure Description	FY 2019-20	FY 2020-21	FY 2021-22
			Value	Value	Value
Build Student Education Capacity	1a	Total Number of Student Hours by Program (excludes medical students)	263,099	234,496	315,031
		BCCH	96,351	99,084	120,297
		BCEHS	58,586	34,503	61,668
		BCW	40,904	29,915	45,954
		BCMHSUS (Forensics, MH & Addictions, Burnaby Centre, CHS, Red Fish)	28,193	32,894	38,909
		BC CANCER – all locations	28,229	24,965	30,775
		Sunny Hill	5,845	7,097	10,924
		All Other	4,991	6,038	6,504
	1a	Total Number of Students by Program (excludes medical students)	1,714	1,465	2,130
		BCCH	637	582	797
		BCEHS	351	244	439
		BCW	367	251	362
		BCMHSUS (Forensics, MH & Addictions, Burnaby Centre, CHS, Red Fish)	175	202	262
		BC CANCER – all locations	106	104	139
	Sunny Hill	58	62	97	
	All Other	20	20	34	
1b	Total Number of Medical Students (Undergraduate & Post-Graduate)				
	Undergraduate Medical Students (annual)	463	451	492	
	Post-Graduate Medical Students (annual)	851	866	858	
1c	Estimated Cost of Staff Time by Encounter Type**				
	One-to-one	\$4,451,977	\$3,383,777	\$4,843,982	
	Group	\$164,119	\$169,070	\$226,859	
1f	Total Number of PHSA declined placement requests in HSPnet**	208	384	377	
1g	Total # of Staff Participants participating in Preceptor/Educator Training				
	Educator Pathway Project (Preceptor/Educator Training)	235	265	526	
	BC Emergency Health Services (Preceptor Training)	55	98	57	
1h	Total Number of Preceptors in HSPnet with and without a placement				
	With a placement	369	348	377	
	Without a placement	237	325	309	
Build Effective Partnerships and Collaborations to Support Innovation	2a	Total # of Affiliation Agreements	76	69	75
	2b	Top 5 Education Institutions by student hours-all disciplines			
		BCIT	67,329	57,646	75,262
		University of BC	45,677	39,573	51,366
		Justice Institute of BC	52,705	29,558	45,456
		Thompson Rivers University	11,014	20,062	22,214
	Douglas College	13,582	14,622	17,579	
2c	Distribution of Student Hours by Student Education setting**				
	Hospital	136,879	131,485	175,874	
	On Car	58,586	34,503	61,668	
	Out Patient/Mixed	56,360	54,479	66,887	
	Other (Population Health and Corporate)	11,434	14,028	10,602	
Results	3a	# of hires at PHSA with previous PE Placement	482(18%)	195 (11%)	567 (14%)

**Excludes undergraduate and post-graduate medical students and paramedics

COVID - 19 PANDEMIC

CONTINUING KEY ROLE FOR PHSA

The COVID-19 pandemic continued to have a significant impact on PHSA's research and student education mandates in fiscal year 2021/22.

While research and student education activities were fully resumed during the past fiscal year, COVID-19 continued to be a key area of research and collaboration. PHSA worked with multiple provincial partners, including the University of British Columbia (UBC), the BC government, funders, and other health authorities and universities, to chart new paths for supporting clinical research and data access. PHSA researchers led more than 70 COVID-19 research studies, generating more than \$13.5M in new COVID research funding over the course of the year (see Appendix 5 for details). The BC Centre for Disease Control, in collaboration with PHSA's Data Analytics Research and Evaluation (DARE) team, continued to play a central role in conducting research and analytics utilizing real time data to inform the provincial pandemic response.

Several PHSA research institutes identified COVID-19 achievements amongst their Top 3 achievements for the year. These achievements included:

- Generating evidence that school settings do not present an increased risk of SARS-CoV-2 transmission when compared to community settings when appropriate mitigation factors are in place, a key finding which strongly influenced provincial school policies
- Determining that delaying the second COVID-19 vaccine dose could lead to a stronger immune response, a finding that has implications for the ongoing global vaccination effort
- Establishing the BC Provincial COVID-19 Consent to Contact Registry Database (CCRD), a registry of more than 60,000 British Columbians who have previously tested positive for COVID-19 and who have consented to be contacted for related research
- Acting as a key partner in the COVID-19 Clinical Research Coordination Initiative which received the Clinical Trials BC Service & Support Award

Cumulatively, these efforts reflected the strength of PHSA researchers in responding to an international pandemic with focused research that has made a difference in shaping public health policies and impacting patient outcomes.

The 2021-2022 fiscal year saw an increase in student placement activities in comparison to the first year of the pandemic (from 2,782 to 3,480). The number of students in the nursing and allied health roles increased by 665 students (31%) over last fiscal year, representing the results of concerted efforts to resume learning activities during the COVID-19 pandemic.

As the pandemic moved through different phases and circulation of COVID variants, corresponding activities included:

- Updating guiding policies, practices and resources to ensure safe learning environments and provision of care during the pandemic
- Identifying processes for students and post-secondary partners to comply with Provincial Health Officer Order for COVID-19 Vaccination status and preventive measures for health settings
- Maintaining collaborative planning tables and resources to support shared understanding of any adjustments to regular student education planning processes

The number of students in the nursing and allied health roles increased by 665 students (31%) over last fiscal year.

Recognizing the importance of coordinated and consistent efforts to sustain student learning in order to meet current and future health workforce needs, PHSA played a key leadership role in the provincial response. Provincial student education data from Health Sciences Placement Network (HSPnet), the web-based student education placement system owned by PHSA and used across Canada, was used for provincial planning purposes. Provincial forums with post secondary institutions (PSIs), health care organizations (HCOs) and government partners were hosted monthly to support consistent and coordinated approaches wherever possible, and a website for student education was developed and hosted by PHSA to provide a single source of information for multiple stakeholder groups, hosted on healthcarebc.ca domain (<https://spe.healthcarebc.ca/>). Both the website and webinars have been well-received by provincial partners, with the website seeing 13,282 page visits this year, and webinars averaging 60 participants per session.

Annual metrics show that PHSA's researchers attracted the highest ever amount of external research funding and supported the highest ever number of students with clinical placements.

PHSA also contributed to maintaining the currency of the provincial guideline: *Student Practice Education Guideline for Healthcare Settings during the COVID-19 Pandemic*, which:

- Emphasizes the importance of maintaining learning continuity in the preparation of the future workforce of the health system
- Articulates principles for both health and education sectors to adopt in planning and coordinating student placements
- Provides a process for decision-making about any potential significant delays or suspensions in Placements
- Clarifies the application of provincial Orders and Guidance to student education to support consistent practices across the province

The evolving circumstances of the pandemic has required collaborative approaches across both health and education sectors to find creative solutions, establish communication processes and platforms, and support the shared goal of preparing the future workforce of the health system.

ONE OF CANADA'S LARGEST ACADEMIC HEALTH SCIENCE ORGANIZATIONS

PHSA ATTRACTS HIGHEST EVER RESEARCH FUNDING AND SUPPORTS OVER 3,000 STUDENTS

Annual metrics show that PHSA's researchers attracted the highest ever amount of external research funding and supported the highest ever number of students with clinical placements, reflecting the growing strength of PHSA's research and student education enterprise over the past fiscal year.

PHSA researchers generated more than \$177 million in external funding this past year, an increase of more than \$28 million over the previous year. PHSA also plays a unique role in BC's health education system and provided specialized training placements often unavailable elsewhere in the province, to 3,480 students this past year.

These two critical dimensions of PHSA's tripartite mandate to deliver care, conduct research, and train students continued to be reflected in PHSA's annual three-year service plan under Objective 3.6: *Commitment to the central position of science, evidence and education in wellness, care, and policy.*

In addition, PHSA initiated development of its first enterprise-wide research strategic plan this past fiscal year. Championed by PHSA's Research Leadership Council (RLC), and framed as a Three-Year Research Roadmap, the plan aims to improve the success of the PHSA research enterprise through collective and coordinated efforts that:

- strengthen alignment with clinical priorities
- optimize investment in research
- remove barriers
 - enable scaling and sharing of resources
- strengthen shared infrastructure and expertise

After completing an environmental scan in June 2021, an extensive stakeholder engagement process was initiated in September 2021 using a web-based engagement tool. Through an iterative process, RLC reviewed, synthesized, and prioritized the engagement results, culminating in identification of 32 projects supporting 11 strategic initiatives that will guide collective action across PHSA's research enterprise beginning in 2022/23.

The development of this first ever organization-wide research strategic plan reflects and reinforces PHSA's commitment to its academic health science mandate, a mandate which flourished this past year despite the challenges posed by COVID-19.

Research Metric Highlights

PHSA researchers attracted \$177 million in external funding in FY 2021/22, including \$13.5 million in COVID-19 research funding. Reflecting their competitive success, PHSA researchers surpassed the national average success rate in the Canadian Institutes of Health (CIHR) fall and spring operating grants. The total number of PHSA researchers fell in comparison to the previous year, from 952 to 940 researchers. However, this reflects a decrease only in category 2 researchers, those who have fewer than 30 hours per week protected time for research. The number of category 1 researchers, those who have 30 or more hours of protected time for research each week, increased by nine, representing the highest number of individuals primarily dedicated to research in the past three years. The number of research trainees grew to 2,917, up 254 in comparison to 2,663 the prior year. PHSA researchers continue to publish prolifically, with the total number of publications up across all but one of the PHSA research entities. Revenues from the Research Support Fund, a federal funding program that supports the indirect costs of research, increased from \$4.1 million to \$4.3 million.

PHSA actively advances commercialization of research discoveries and doubled its IP revenue in FY 2021/22 to \$3,419,741 from the previous year's \$1,782,486. The number of inventions disclosed decreased from 40 to 35, the number of provisional patent applications and PCT applications filed remained stable at 17 (down from 18) and 8 (up from 7) respectively. However, the number of patents filed increased very significantly, from 20 to 115, and the number of patents issued also increased from 21 to 30. The large increase in patents filed reflects increased activity at two BC Cancer spinoff companies, Alpha 9 and Innovakine, while the increased number of patents issued relate primarily to BC Cancer spinoff companies Essa and Alpha 9. The number of active licensing agreements increased from 125 to 130. One new spinoff was created called Amphoraxe Life Sciences Inc., bringing the number of active spinoff companies to 19.

PHSA's Three Year Research Roadmap aims to improve the success of the PHSA research enterprise through collective and coordinated efforts.

The mission of Vancouver-based Amphorax is to rapidly develop antimicrobial peptides (AMPs) as alternatives to conventional small molecule antibiotics for use in veterinary applications - specifically in poultry meat and egg production. AMPs are a potential alternative to small molecule antimicrobials, whose use is restricted now on North American farms in an effort to reduce antibiotic resistance. AMPs act faster than small molecule antimicrobials, and do not cause DNA damage. As a result, they do not induce resistance to the same degree as conventional antibiotics. The founder of Amphorax is computational biologist Dr. Inanc Birol, a distinguished scientist at Canada's Michael Smith Genome Sciences Centre, and an adjunct scientist at BC Centre for Disease Control, and the impetus for the company was a Genome BC grant that funded the initial work. The company is at a very early stage but has a long-term vision to develop novel human therapeutics.

Clinical trial activity, after remaining stable for the past two years, increased significantly in 2021/22. The number of active trials increased from 657 active trials last year to 695 trials in FY 2021/22. The number of enrolled subjects increased 76 per cent, 20,591 to 36,287 subjects.

A significant factor in the increased number of enrolled subjects was an international study led by Dr. Mark Ansermino that is evaluating a trigger tool aimed at reducing the time to diagnosis and prompting the timely initiation of life-saving treatment for children with sepsis. The low-cost tool, which requires minimal clinical expertise, training, and time to use, is hoped to overcome the barriers to diagnosis and treatment of sepsis that make sepsis the leading cause of death and disability in children worldwide. These challenges are particularly relevant in poor countries. More than 12,000 subjects from Jinja Hospital in Jinja, Uganda and Mbagathi Hospital in Nairobi, Kenya, were enrolled in the trial over the course of the year. PHSAs impressive research metrics reflect both the resilience of PHSAs research strength in the face of COVID-19, as well as the success of PHSAs researchers in accessing new COVID-related research funding.

Student Education Metric Highlights

To align with the training component of the tripartite mandate, PHSAs committed to championing quality student education experiences across our services and programs. With specialized services and unique staff knowledge and expertise, PHSAs plays a critical role in the development of a prepared workforce across BC's health system. Student practice education includes the learning activities that occur in health settings for students who are enrolled in a recognized academic institution who have a practicum as part of their program requirements.

Student education data supports informed and strategic decisions to align student education activities with health human resource strategies and changing health system needs. PHSAs monitors and communicates student activity data by discipline, academic partner, and PHSAs program each term and annually.

PHSAs supports learning for students from all disciplines of the health care teams in its programs. PHSAs proudly welcomed a total of 3,480 students in placements across the organization in the past fiscal year. Of these students, 492 were medical undergraduates (MDUG), 858 were enrolled in Post-Graduate Medical Education (PGME) or residents, 1,069 were nursing students, and 1,061 were other members of the interprofessional team.

Student education data supports informed and strategic decisions to align student education activities with health human resource strategies and changing health system needs.

The following disciplines had more activity (hours) than pre-pandemic levels: Unit Clerks and Medical Office Assistants, Bachelor of Nursing, Practical Nursing, Paramedics, Counselling Psychology, Master of Social Work and Clinical Genetics Technologists.

There were 377 preceptors actively supporting students this year, for an estimated cost of staff time of \$5 Million, with 583 preceptors who participated in training. PHSA has education affiliation agreements with 75 academic partners to support these placements. The top five partners this year for the most student placement hours (excluding medical students' hours) are BC Institute of Technology (BCIT), University of British Columbia (UBC), Justice Institute of BC (JIBC), Thompson Rivers University (TRU) and Douglas College. Based on the feedback in a new hire survey, 351 new employees hired at PHSA this year stated that their experience on placement influenced their decision to join our organization as employees.

RESEARCH IMPACTS AND OUTCOMES

PHSA-LED DISCOVERY IS MAKING A DIFFERENCE FOR PATIENTS

While quantitative metrics describe PHSA's academic health science mandate to a degree, the qualitative description of accomplishments, outcomes and studies generated using PHSA's rich registry data sets is needed to more fully understand how PHSA research is impacting patients, populations, and the health system.

For the fifth year, PHSA research entities were asked to identify their top three accomplishments, giving them an opportunity to highlight key successes relevant to their differing foci, strengths, and size. Several of the top three accomplishments this past year related to Covid-19, as already discussed. Others reflected provincial, national and international level contributions in other vital domains.

Detailed in this report's program specific sections, examples of non-COVID-19 key accomplishments include:

- Development of a new genomic screening tool that screens tumour tissue for variants in 45 different genes and can identify people with increased susceptibility to cancer
- Establishment of new robotic stem cell research equipment that enables researchers to make heart tissues, and even "mini hearts" called cardioids, from a specific child's cells so they can study irregular heart rhythms and test potential treatments
- The naming of PHSA researchers as recipients of important awards in mental health research, recognizing both the contributions of senior researchers to bodies of evidence as well as the contributions and potential of trainees
- Launch of a new multi-stakeholder participatory project to inform guidance for gender-equitable practice within BC's women's health research community
- Development of a two-tier alerting system that distinguishes between a heat warning (i.e., very hot weather) and an extreme heat emergency (i.e., dangerously hot weather) and supports the use of broadcast intrusive alerting in the event of an extreme heat emergency

Quantitative metrics tell only part of PHSA's success story. The impacts resulting from PHSA-led research are further illuminated through top accomplishments, outcomes, and the studies generated using PHSA's rich registry data sets.

PHSA research is being applied to guide BC's pandemic response and to improve the health of British Columbian, Canadian and international populations.

As in past years, PHSA research entities were asked to identify any guideline, drug, diagnostic agent, or device adopted or approved in FY 2021/22 as a result of research driven by PHSA researchers, or collaborative research in which PHSA researchers were key participants. Recognizing that PHSA research entities function across the research spectrum from basic cell biology to clinical research to health system research, *research* outcomes generated in the basic research domain are also included. Research outcomes are innovations such as methodologies or software used in the conduct of research that have been developed by PHSA researchers and adopted or approved by other major entities in FY 2021/22.

COVID-19 continued to play a major role in shaping this year's outcomes. PHSA research entities led research and developed evidence-based guidelines that have aided BC and Canada in responding to the global pandemic. Examples of COVID-19 related outcomes, detailed in the program sections of this report, include the following:

- BCCDC researchers identified the potential for SARS-CoV-2 virus to mutate in mink, leading the province of British Columbia to begin a process of phasing out B. C's mink farming industry.
- A team of BCCHRI researchers identified factors that predict intentions to be vaccinated against COVID-19, specifically in key priority groups for early immunization, informing the approach to public health messaging around COVID-19 vaccines by provincial and federal agencies.
- BCMHSUS researchers reported a case of a COVID-19 vaccine-related side effect of clozapine, an important agent used to help those with schizophrenia, alerting clinicians to the possible side effect and providing practical strategies for mitigation which allow patients to continue taking the drug.
- A WHRI investigator provided research evidence based on a national surveillance study that was used to support a revision to a national clinical consensus statement recommending all pregnant persons be prioritized to receive a COVID-19 vaccination (i.e., during pregnancy and/or at the time of breastfeeding).

In addition to COVID-19 related outcomes, PHSA research entities achieved outcomes that advanced care, treatment, and prevention in many other areas. Examples of non-COVID-19 outcomes, further detailed in the program sections of this report, include the following:

- A WHRI researcher launched an online interactive patient decision aid, *My Next Birth*, in partnership with Perinatal Services BC, BC Women's Hospital and PHSA, that is now the new provincial standard for choosing mode of birth after a previous caesarean.
- BCCHRI researchers developed a tool to measure parental anxiety related to their child's food allergy that reliably and accurately identifies parental food allergy-associated anxiety in ways other tools cannot, allowing quick determination of parents in need of further psychological support.
- A BC Cancer researcher designed and led a trial that determined a new radioligand therapy for advanced prostate cancer improved overall survival and patient reported quality of life. The treatment has been recently approved in the USA and is undergoing regulatory review in Canada.
- Researchers from BCCDC and BCMHSUS co-developed the first edition of *Guidelines for Sexually Transmitted and Blood-Borne Infection (STBBI) Testing and Care in BC Correctional Centres*. These guidelines will ensure care for STBBIs in provincial correctional centres is culturally safe, person-centered and trauma informed.

PHSA's large number of provincial registries and longitudinal data sets on services provided to specific populations and related outcomes is a major asset of PHSA. These rich data resources, unique in Canada, include a wealth of information that can be studied to gain insights on clinical outcomes and health system design. A survey of PHSA's registry data stewards identified many research questions currently being addressed through registry data. Below are just a few examples, highlighting the tremendous research value of these datasets, and how they are being used to directly improve health outcomes and evaluate optimum care delivery models.

- Tissue samples from the BC Children's Hospital Biobank are being used to develop biomarkers for clinical diagnosis of stage and response to treatment in inflammatory bowel diseases.
- Data from the BC Cardiac Registry are being used to understand whether use of two different classes of medication post cardiac surgery is associated with a reduction in death and major adverse cardiovascular events.
- Data from Endometriosis and Pelvic Pain Interdisciplinary Cohort (EPPIC) are being used to determine how many patients with endometriosis associated pelvic pain found progesterone treatment ineffective for their pain or discontinued this treatment due to side-effects.
- The COVID-19 dataset was used to evaluate the effectiveness of COVID-19 vaccines against infections and severe outcomes.
- PROMIS Renal data were used to evaluate COVID-19 effectiveness in chronic kidney disease patients.
- PROMIS Transplant data were used to study whether a home-based exercise program prior to kidney transplantation resulted in improved outcomes for post-operative recovery, complication rates, length of stay and mortality.
- Perinatal Services BC Registry data were used to assess early childhood mortality and severe morbidity among children born with and without neonatal abstinence syndrome, a withdrawal syndrome that can occur in newborns exposed to certain substances, including opioids, during pregnancy.
- BC Trauma Services Registry data were used to assess whether a mortality difference exists between major trauma patients because of a difference in Helicopter EMS or Ground EMS care and transport.
- BC Cancer Registry data were used to study the rural-urban divide in breast cancer diagnosis and treatment.
- BC Cancer Lung Cancer Screening Program data were used inform management of screening low dose CT detected lung nodules.
- Data from BC Cancer's Breast Cancer Screening Database were used to assess the performance of artificial intelligence systems for breast cancer detection using digital mammograms.
- Data from BC Cancer's Cervical Cancer Screening Program were used to understand downstream outcomes for certain patient types.
- Data from the Paramedic System Evaluation and Research Database were used to study the perception of Canadian Community Paramedics regarding education and preparation for practice.

PHSA's rich data resources, unique in Canada, include a wealth of information that can be studied to gain insights on clinical outcomes and health system design.

Discovery, innovation, and the application of new knowledge generated by PHSA researchers is clearly making a difference, improving clinical outcomes and the effectiveness of BC's health system in myriad ways.

STUDENT EDUCATION IMPACTS AND OUTCOMES

PHSA IMPLEMENTS A THREE-YEAR STUDENT EDUCATION ROADMAP

PHSA launched a three-year Student Education Roadmap to situate PHSA as an exemplar in student education.

Developed as part of its 2019-2020 Service Plan, PHSA entered year two of its three-year Student Education Roadmap, designed to situate PHSA as an exemplar in student education. Progress was made on each of the following eight recommendations identified in the Roadmap:

1. Implement strategic planning processes for student education across PHSA
2. Adopt and optimize best practices for coordinating student placements
3. Establish an organizational approach to ensuring the delivery of quality student experiences
4. Expand the monitoring and evaluation of education activities and learning environments
5. Prepare students to meet the needs of patients throughout the health system
6. Strengthen effective partnerships to support student education
7. Establish a collaborative approach to provincial leadership for student education
8. Lead advancement and innovation in student education models, designs, approaches, and practices

Implementation of the Student Education Roadmap is strengthening PHSA's ability to deliver the fundamental outcome of ensuring a high-performance workforce is in place to meet the health needs of British Columbians in the future.

RESEARCH METRICS

PHSA OVERALL

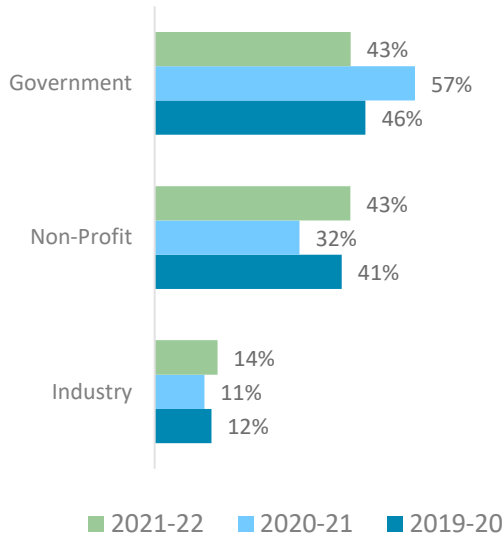


PRODUCING AND ADVANCING KNOWLEDGE

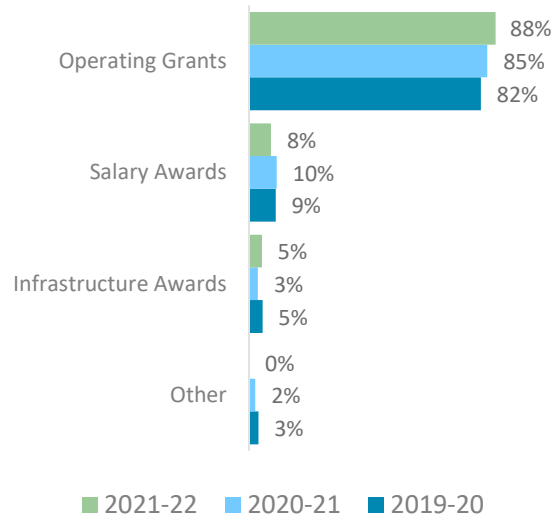
\$177 Million

in TOTAL GRANTS AWARDED in FY 21-22
\$140 Million in FY 20-21

\$ BY SECTOR



\$ BY AWARD TYPE



PUBLICATIONS

BCCHR	1,284
BCCRI	761
WHRI	1,006
BCCDC	301
BCMHSUS	151



100%

% of CIHR competitions above
National AVG SUCCESS RATE
in FY 21-22

100% in FY 20-21

ECONOMIC BENEFITS & INNOVATION

\$3.4M

of REALIZED REVENUE
in FY 21-22
\$1.8M in FY 20-21



7new

ACTIVE LICENSES
in FY 21-22
15 new in FY 20-21



115 patents filed
30 patents issued

in FY 21-22
20 Filed / 21 Issued in FY 20-21

15 spin-offs (1 new)

of ACTIVE SPIN-OFFS in FY 21-22
18 (1 new) in FY 20-21

BUILDING RESEARCH CAPACITY

940.5

OF RESEARCHERS
in FY 21-22
952 in FY 20-21



2,917

OF TRAINEES
in FY 21-22
2,663 in FY 20-21

\$ 4.3Million

RESEARCH SUPPORT
FUND GRANTS
in FY 21-22
\$4.1 Million in FY 20-21

HEALTH & POLICY BENEFITS



695

OF CLINICAL TRIALS
in FY 21-22
657 in FY 20-21

36,287

TOTAL CUMULATIVE
SUBJECT ENROLLMENT
at the end of FY 21-22
20,591 at the end of FY 20-21



39%

% INDUSTRY FUNDED
TRIALS in FY 21-22
42% in FY 20-21

273 requests

257 approved

REGISTRY ACCESS REQUESTS/
APPROVALS in FY 21-22

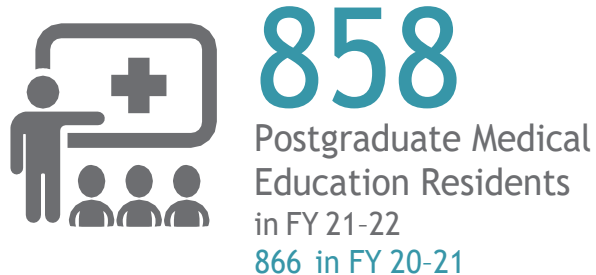
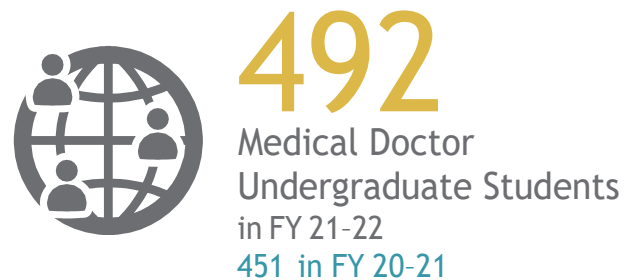
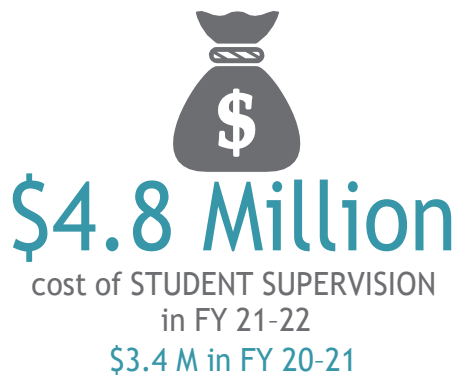
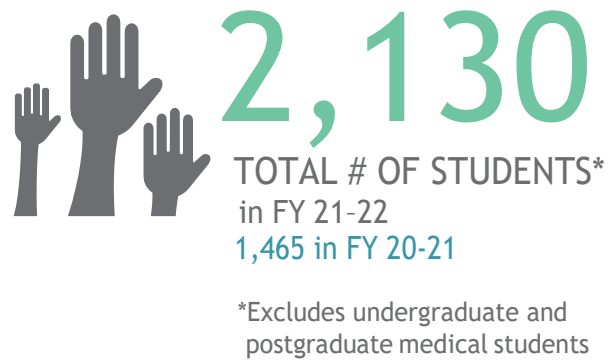
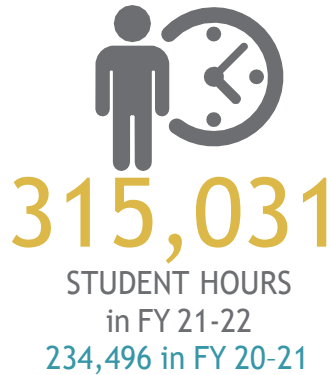
208 requests / 193 approvals in FY 20-21

STUDENT EDUCATION METRICS

PHSA OVERALL



••• BUILD PRACTICE EDUCATION CAPACITY •••



BUILD EFFECTIVE PARTNERSHIPS & COLLABORATION TO SUPPORT INNOVATION



TOP EDUCATION INSTITUTIONS BY STUDENT HOURS in FY 21-22

1. BC Institute of Technology (75,262)
2. University of BC (51,366)
3. Justice Institute of BC (45,456)
4. Thompson Rivers University (22,214)
5. Douglas College (17,579)



DISTRIBUTION OF STUDENT HOUR by PRACTICE EDUCATION SETTING in FY 20-21

- Hospital (56%)
- On Car (20%)
- Outpatient/Mixed (21%)
- Other (3%)



50

of ACADEMIC PARTNERS WITH AN ACTIVE PLACEMENT in FY 21-22
38 in FY 20-21

QUALITY OF CLINICAL LEARNING ENVIRONMENT & RESULTS

TOP 5

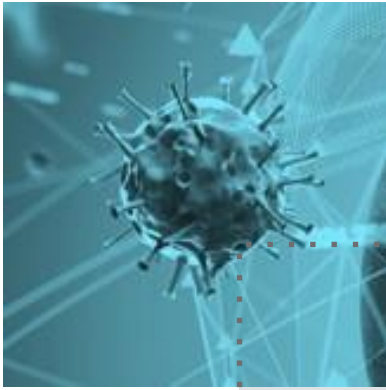
TOP EDUCATION INSTITUTIONS FOR STUDENT PLACEMENT for NEW HIRES in FY 21-22

1. BC Institute of Technology
2. University of BC
3. Justice Institute of BC
4. Stenberg College
5. Vancouver Community College



14%

of new hires with a PHS A PLACEMENT in FY 21-22
11% in FY 20-21



BC Cancer Research Institute (BCCRI)

RESEARCH METRICS
STUDENT EDUCATION METRICS

RESEARCH METRICS

BCCRI

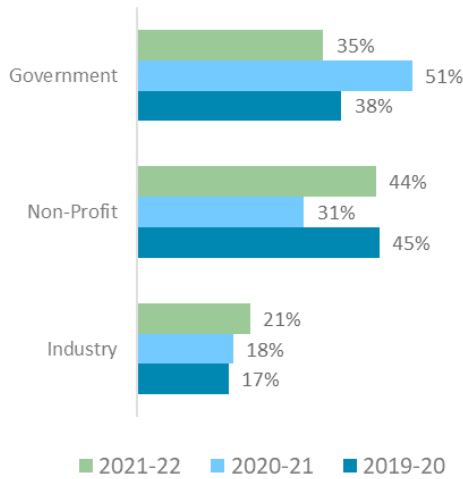


PRODUCING AND ADVANCING KNOWLEDGE

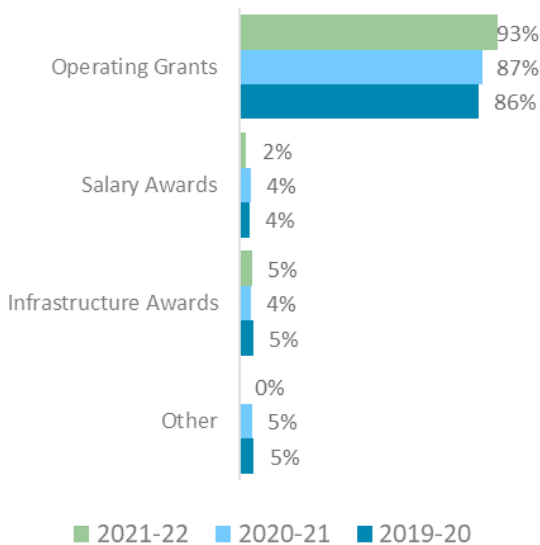
\$94 Million

in TOTAL GRANTS AWARDED in FY 21-22
\$73 Million in FY 20-21

\$ BY SECTOR



\$ BY AWARD TYPE



761 TOTAL
OF PUBLICATIONS
in FY 21-22
776 in FY 20-21

615
JOURNAL ARTICLES
in FY 21-22
659 in FY20-21


99%
PEER REVIEWED
in FY 21-22
99% in FY 20-21



50
% of CIHR competitions
above National AVG
SUCCESS RATE
in FY 21-22
0% in FY 20-21

ECONOMIC BENEFITS & INNOVATION

\$2.2M
of REALIZED REVENUE
in FY 21-22
\$1.1M in FY 20-21


 **114** patents filed
25 patents issued
in FY 21-22
19 filed / 20 issued in FY 20-21

 **49**
ACTIVE LICENSES
(7 new) in FY 21-22
5 new in FY 20-21

15 spin-offs (1 new)
of ACTIVE SPIN-OFFS in FY 20-21
13 (2 new) in FY 19-20

BUILDING RESEARCH CAPACITY


321.5
OF RESEARCHERS*
in FY 21-22
344.5 in FY 20-21


 **657**
OF TRAINEES
in FY 21-22
612 in FY 20-21

\$1.5 Million
RESEARCH SUPPORT
FUND GRANTS
in FY 21-22
\$1.5 Million in FY 20-21

HEALTH & POLICY BENEFITS

 **388**
OF CLINICAL TRIALS
in FY 21-22
362 in FY 20-21

7,369
TOTAL CUMULATIVE
SUBJECT ENROLLMENT
at the end of FY 21-22
6,982 at the end of FY 20-21 

 **51%**
% INDUSTRY FUNDED
TRIALS in FY 21-22
57% in FY 20-21

*excluding affiliate investigators

TOP 3 RESEARCH ACHIEVEMENTS BC CANCER



Details available in Supplementary Report

1

Tumour Sequencing for Changes of Clinical Significance

BC Cancer researchers, led by distinguished Genome Sciences Centre (GSC) scientist Dr. Aly Karsan, used next generation sequencing technologies to develop a test that screens tumour tissue for variants in 45 different genes. This includes both acquired and inherited changes known to be clinically significant. In addition to providing potential treatment information to patients with advanced cancer, this new screening tool—referred to as the Oncology and Hereditary Cancer Program (OncoHCP) panel—can identify people with increased susceptibility to cancer.

2

Capacity building at satellite sites to enable remote patient clinical trial follow-up

Dr. Robert Olson, radiation oncologist and research lead at BC Cancer - Prince George, has been spearheading methods of supporting patients participating in clinical trials living in rural and remote areas around Terrace or Trail to connect with physicians closer to home for their follow-up care. Dr. Olson received one of three proof-of-concept (PoC) project awards from the Canadian Cancer Clinical Trials Network (3CTN) for Canadian cancer centres that are now working on capacity-building for satellite sites in their region.

3

PREDiCT Initiative begins in B.C., and is shared nationally

In May 2021, BC Cancer announced a public-private partnership with Hoffmann-La Roche Limited (Roche Canada) and the Canadian Personalized Healthcare Innovation Network (CPHIN) to create a real-world evidence (RWE) framework called PReCision Oncology Evidence Development in Cancer Treatment (PREDiCT). This framework allows for dynamic integration of genomic features, clinical metrics, and health economic impact. Dr. Dean Regier and the PREDiCT team have started to socialize the framework across Canada.

TABLE 1 BCCRI Outcomes


Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-2 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ) , and COVID-19 Related if icon appears.
<p>The BC Cancer Breast Cancer Outcomes Unit published two manuscripts in 2021 about the risk of chest wall recurrence after post-mastectomy radiotherapy and the risk of in-breast recurrence after breast radiotherapy. The use of bolus on the skin increases the toxicity of post-mastectomy radiotherapy, both during treatment and for years afterwards.</p>	<p>These BC Cancer Breast Cancer Outcomes Unit publications led to the development and publication of international guidelines recommending against the use of bolus during post-mastectomy radiotherapy for most patients. Reducing the use of bolus during the treatment of breast cancer will improve the quality of life of breast cancer survivors.</p>	<p>Patient: Protocols and guidelines</p>
<p>A BC Cancer researcher wrote a chapter on molecular pathology of pediatric cancers in the main reference text used for practicing clinicians.</p>	<p>The researcher is an international leader in the field of molecular pathology of pediatric cancers and his contribution to this main reference text establishes the new guidelines to be followed worldwide for practicing clinicians. This ensures up-to-date guidelines for every molecular pathologist, consistent diagnostics across this field of study and access to tailored treatment based on an accurate diagnostic.</p>	<p>Patient: Protocols and guidelines</p>
<p>BC Cancer Researcher has developed an ultra-light carbon fibre device to support patients receiving radiation therapy for breast cancer.</p>	<p>Adjustable Reusable Accessory), helps position the breast to reduce acute painful skin reactions and to improve survival by reducing radiation dose in the lung. This carbon-fibre technology is transparent to radiation and is expected to find other applications in radiation therapy to improve patient care. CARA is being used in pilot treatment studies at three BC Cancer centres. A randomized clinical trial is underway to further assess whether reductions in acute skin toxicity are achievable and commercialization work is underway to make it more broadly available.</p>	<p>Patient: Access to new treatment /technology</p> <p></p>
<p>BC Cancer researchers have established the BASIC (BC Cancer Research Histology and Digital Imaging Core) Lab, which offers a methodology developed by BC researchers to support personalized oncogenomic programs.</p>	<p>The BASIC (BC Cancer Research Histology and Digital Imaging Core) Lab was established to serve the need of the BC Cancer research community for core research/translational pathology services. The lab also serves as the processing hub for pathology specimens of the Personalized OncoGenomics (POG) and Marathon of Hope (MOH) programs. The BASIC lab will undergo DAP clinical certification later in 2022 which will make POG/MOH a fully clinically-accredited pipeline.</p>	<p>System: Resource improvements</p> <p></p>

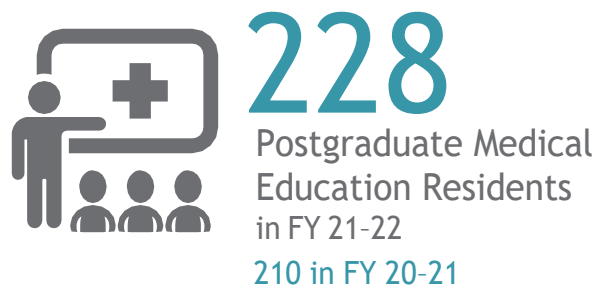
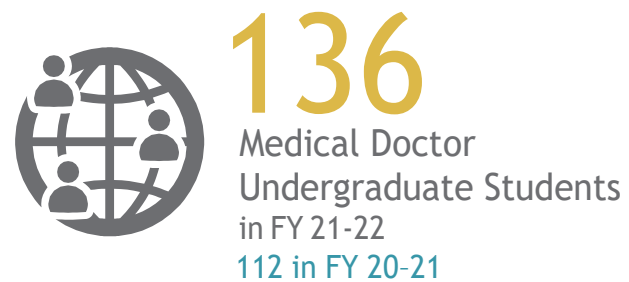
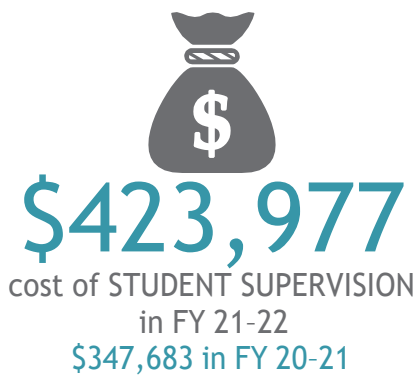
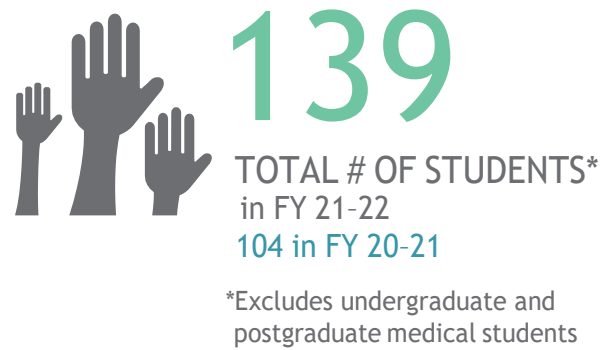
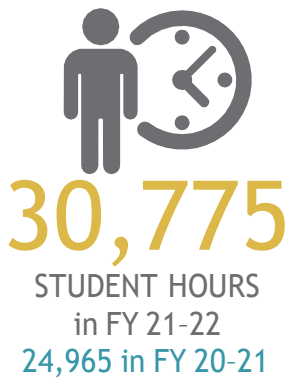
TABLE 1 BCCRI Outcomes (continued)

Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-21 as a result of research driven by PHSAs researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ) , and COVID-19 Related if icon appears.
<p>BC Cancer Researcher reported on the VISION study, a trial that he helped to design and steer. BC Cancer patients were recruited through this trial, which evaluated the value of a specific type of radio-ligand therapy, a type of cancer treatment that delivers radiation to specifically targeted cancer cells, with a minimal effect on healthy cells. The treatment showed that the new radio-ligand therapy improved overall survival and patient reported quality of life. The treatment has been recently approved in the USA and is undergoing regulatory review in Canada. Results from the VISION study were published in the <i>New England Journal of Medicine</i>.</p>	<p>This trial established the efficacy of a new radioligand therapy for advanced prostate cancer. The treatment, Lutetium-PSMA-617, was shown to delay progression, improve overall survival, and preserve quality of life.</p>	<p>Patient: Access to new treatment /technology</p> 
<p>Research has led to introduction of a new patient portal developed for hereditary cancer program (HCP) genetic testing. A BC Cancer study showed that 1) large-scale group genetic counselling was acceptable to a heterogeneous population with group counselling delivered as a standard presentation (one size fits all approach) and that 2) the mutation detection rate was sufficient to test unaffected individuals meeting HCP referral criteria. With the COVID-19 pandemic, in-person group sessions were converted to online webinars. The online portal was introduced to allow patient access to the standard presentation format of pre-test counselling in their own time and to also efficiently gather their health and family history information, enable them to decide on genetic testing in their own time, consent, and print the blood requisition, therefore increasing rapid access to testing (and decreasing the HCP waitlist).</p>	<p>BC Cancer Researcher co-led the development and launch of the Hereditary Cancer Program's online portal to improve timely access to genetic testing for individuals at-risk for hereditary cancer. Hundreds of patients have now gone through the portal and early examination of the patient reported outcomes show that patients feel empowered by and satisfied with the experience.</p>	<p>Patient: Improvements in timely access to care</p>
<p>A BC Cancer researcher developed a novel method of sequencing the genomes of single cells. This new sequencing methodology has enabled BC Cancer researchers to reveal that early platinum resistance in cancer treatment might be reversible.</p> <p>This was a landmark discovery from a BC Cancer researcher representing several years of work with human breast cancers that have been propagated by transplantation.</p> <p>Results from this study were published in the journal <i>Nature</i>.</p>	<p>This research started with validation studies to prove Using a novel method of sequencing the genomes of single cells, the research team monitored the evolution of these cancers under drug treatments with platinum, a commonly used chemotherapeutic agent. They discovered that changes in gene dosage in the genome, called copy number mutations, can contribute to platinum resistance. They also discovered that the cell state of platinum resistance, has a "cost" - it makes the cells weaker than non-resistant cells when platinum is not present. This means that early platinum resistance might be reversible and suggests clinical trials of re-challenge therapy may prove worthwhile.</p>	<p>Patient: New knowledge</p>

STUDENT EDUCATION METRICS

BC CANCER

BUILD PRACTICE EDUCATION CAPACITY



• • • BUILD EFFECTIVE PARTNERSHIPS & COLLABORATION TO SUPPORT INNOVATION • • •



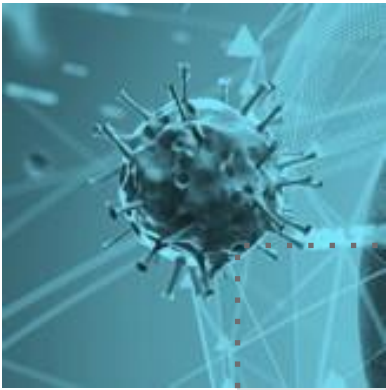
TOP EDUCATION INSTITUTIONS BY
PLACEMENT HOURS in FY 21-22

1. BC Institute of Technology (21,913)
2. University of BC (3,736)
3. Sprott Shaw College (896)
4. Stenberg College (640)
5. City University of Seattle (600)



17

of ACADEMIC PARTNERS
WITH AN ACTIVE PLACEMENT
in FY 21-22
14 in FY 20-21



BCCHR/BC Children's Hospital and Sunny Hill Health Centre

RESEARCH METRICS
STUDENT EDUCATION METRICS

RESEARCH METRICS

BC CHILDREN'S HOSPITAL RESEARCH INSTITUTE

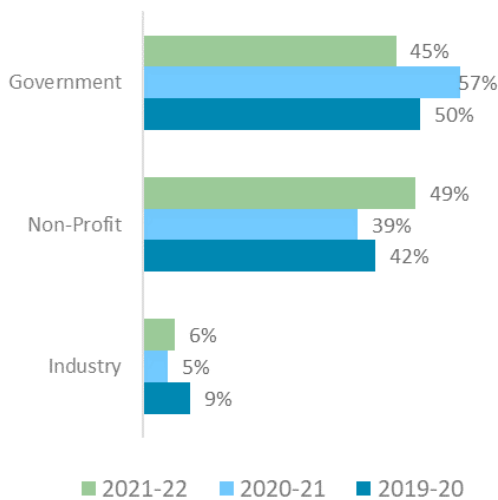


PRODUCING AND ADVANCING KNOWLEDGE

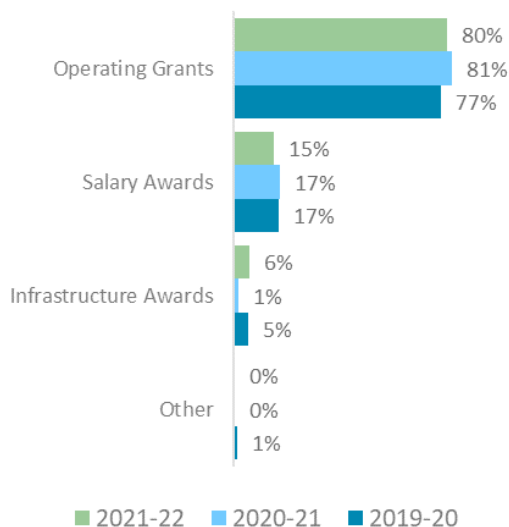
\$66.8 Million

in TOTAL GRANTS AWARDED in FY 21-22
\$61.7 Million in FY 20-21

\$ BY SECTOR



\$ BY AWARD TYPE



1,284 TOTAL
OF PUBLICATIONS
in FY 21-22
1,117 in FY 20-21

1,123
JOURNAL ARTICLES
in FY 21-22
967 in FY 20-21

99%

PEER REVIEWED
in FY 21-22
99% in FY 20-21



50%
% of CIHR competitions
above National AVG
SUCCESS RATE
in FY 21-22
100% in FY 20-21

ECONOMIC BENEFITS & INNOVATION

\$1.2M
of REALIZED REVENUE
in FY 21-22
\$1.1M in FY 20-21



1 patent filed
5 patents issued
in FY 21-22
0 filed, 2 issued in FY 20-21



81
ACTIVE LICENSES
(0 new) in FY 21-22
10 new in FY 20-21

4 spin-offs (0 new)
of ACTIVE SPIN-OFFS in FY 21-22
4 (0 new) in FY 20-21

BUILDING RESEARCH CAPACITY

307
OF RESEARCHERS*
in FY 21-22
303.5 in FY 20-21



935
OF TRAINEES
in FY 21-22
918 in FY 20-21

\$2.2 Million
RESEARCH SUPPORT
FUND GRANTS
in FY 21-22
\$2.1 Million in FY 20-21

HEALTH & POLICY BENEFITS

240
OF CLINICAL TRIALS
in FY 21-22
228 in FY 20-21



22,016
TOTAL CUMULATIVE
SUBJECT ENROLLMENT
at the end of FY 21-22
8,855 in FY 20-21



28%
% INDUSTRY FUNDED
TRIALS in FY 21-22
24% in FY 20-21



*Excluding affiliate investigators

TOP 3 RESEARCH ACHIEVEMENTS

BC CHILDREN'S HOSPITAL RESEARCH INSTITUTE



Details available in Supplementary Report

1

COVID-19 and schools

BC Children's Hospital investigators showed that, with appropriate mitigation factors in place, school settings do not present an increased risk of SARS-CoV-2 transmission when compared to community settings.

At the time of the study, only a few teachers and school staff had been infected with SARS-CoV-2, and most were believed to have contracted it from friends or family rather than in a school setting.

This study was an important basis for determining school policy during the pandemic.

2

Delayed second dose of COVID-19 vaccine leads to stronger immune response

Dr. David Goldfarb and colleagues found that delaying the second COVID-19 vaccine dose could lead to a stronger immune response. The research was the first peer-reviewed study in North America to examine the timing between first and second doses. Investigators compared blood test results from nearly 200 paramedics, some of whom were vaccinated within the earlier recommended interval of less than four weeks, and others who received their second doses after six to seven weeks.

These findings have implications for the ongoing global vaccination effort. The Centers for Disease Control and Prevention in the United States has referenced this research in their decision to recommend extending vaccine dosing interval.

3

Robotic stem cell technology

New robotic stem cell research technology will be a game changer for accelerating new treatment or cures for severe and rare childhood illnesses, such as cancer and heart disease.

Until recently, the work of growing stem cells was performed manually using separate pieces of equipment for different steps of the process. This meant only two or three patients could have their stem cells cultured at the same time. With this new technology, up to 85 patients' stem cells can be cultured simultaneously. This provides researchers with time to delve more deeply into the underlying mechanisms of an individual's disease, and test personalized treatments for patients.

TABLE 2 BCCHR Outcomes



Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ), and COVID-19 Related if icon appears.
<p>The Live 5-2-1-0 app is designed to motivate children ages eight to 12 to adopt healthy behaviours related to nutrition, screen time, and physical activity through simple, customized goal-setting and fun weekly challenges. A new version of the app was launched in January 2022. It includes a new category to encourage children to work on habits, such as sleep, mindfulness, and self-compassion. The update also features a special dashboard for healthcare providers, offering a quick glimpse of patient progress to support conversations with families at follow-up appointments.</p> <p>The team published a paper in March 2022, examining the effectiveness of using apps to promote healthy behaviour changes in children. This systematic review was undertaken to ensure the development of the Live 5-2-1-0 app was informed by the best available evidence. Researchers concluded that health promotion app use in children can increase the adoption of healthy behaviours and improve related outcomes, including physical activity, dietary outcomes, and BMI.</p> <p>Live 5-2-1-0 provides a framework of action for local community leaders to make changes to their programs, practices, policies, and environments so it's easier for kids to eat well, be active, and limit screen time.</p>	<p>The network of Live 5-2-1-0 communities continues to expand across B.C., creating opportunities for new collaborations and knowledge exchange among Live 5-2-1-0 partners. The overarching goal is to make it easier for kids to eat well, be active, and limit screen time.</p> <p>The program promotes a shared, consistent message across the community and engages stakeholders in every sector. It provides clear goals for kids and families to live healthy every day, and a framework of action for local community leaders to make changes to their programs, policies, and environments so that it is easier for kids to achieve these goals.</p>	<p>Patient: Access to new treatment/ technology</p> <p></p>
<p>BC Children’s Hospital investigators developed a family-based approach for caregivers of youth with eating disorders called the Family-Based Therapy Skills Group. The team adapted the individual format to a family-based format in accordance with recent Canadian guidelines, which strongly recommend a family-based therapy approach. This group started in May 2021 and has been offered four times since.</p> <p>The eating disorders program investigators seek to improve patient and family access to services and evidence-based care for eating disorders in the face of long waitlists in the community, and to address system sustainability and increase the number of families receiving care per therapist hour.</p>	<p>This new approach improves patient and family access to eating disorder care and treatment in a way that is more sustainable, particularly given the increase in eating disorders that occurred during the pandemic.</p>	<p>New clinic, program or program expansion</p>

TABLE 2 BCCHR Outcomes (continued)

Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ), and COVID-19 Related if icon appears.
<p>BC Children’s Hospital investigators led the development of an online tool called MyHEARTSMAP to help children and their parents or caregivers find the mental health resources they need. In March 2022, this tool was made available to all children and families across Canada.</p> <p>The MyHEARTSMAP tool offers a list of questions to find out more about a child’s circumstances so they can identify issues and access resources early. A previous study found that two-thirds of children and youth in the province have had mild to moderate mental health challenges during the pandemic.</p> <p>The answers to the questions are fed into an algorithm that triggers resource recommendations, along with suggested timelines in which patients and families should get help.</p>	<p>Children and families across Canada are now able to access an online tool that can help identify and access mental health resources more quickly.</p> <p>The MyHEARTSMAP tool can guide a family through a conversation to make sure all aspects of their mental wellness are discussed. The recommendations may range from seeking support from a family doctor at their earliest convenience, to contacting a child helpline, or going to the nearest emergency department to get urgent help.</p>	<p>Patient: Access to new treatment/ technology</p>
<p>New parents can often struggle to find information and resources they need to best care for their baby. BC Children’s Hospital investigators developed and implemented an evidence-based parenting support program called SmartParent. This text messaging tool can be tailored to the infants’ age and stage of development through the babies’ first year.</p> <p>SmartParent was built as a follow-up to the SmartMom program, which used text messaging to support mothers through pregnancy. The results from this study show improvements in maternal mental health and pregnancy-related knowledge.</p>	<p>SmartParent supports new parents for the first year of an infant’s life. Previous research has shown that similar tools have improved mental health and care during the early stages of a child’s life.</p>	<p>Patient: Access to new treatment/ technology</p>
<p>A quality improvement project at BC Children’s Hospital has led to a new nursing-specific procedure document to aid in the consistent care of patients with eating disorders admitted to the medical unit. Prior to this, there was only a guideline document for physicians that sometimes led to inconsistencies in care and did not meet the needs of nursing staff.</p> <p>The new nursing document, which also includes a family resource handout, was published in February 2022 and is now available to all staff.</p> <p>Nursing care is an essential component in the medical stabilization of children and youth with eating disorders. Nurses provide the structure of nutrition and rest for patients and families to follow once discharged. In addition, nurses enact and model therapeutic meal support and are key resources to families as they learn the first steps of Family-Based Therapy. Family-Based Therapy is the recommended treatment model for patients and their families experiencing eating disorders. This therapy begins during admission with meal support provided by caregivers.</p>	<p>The new nursing-specific procedure document will help provide consistency and clarity in the nursing care of patients admitted with an eating disorder.</p>	<p>System: Process of care-protocol implementation</p>

TABLE 2 BCCHR Outcomes (continued)




Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ), and COVID-19 Related if icon appears.
<p>BC Children’s Hospital investigators found that using the sedative dexmedetomidine during short procedures with minimal anticipated post-procedural pain could cause small delays in the discharge of patients undergoing propofol anesthesia. Based on their feedback, anesthesiologists have modified use of this drug, which might help reduce the time patients spend recovering. This in turn could reduce waitlists and prevent cancellations.</p>	<p>An evidence-based analysis of a particular sedative found that more targeted use could lead to a reduction in patient wait times and potentially prevent case cancellations. This may enable some patients to have their surgeries sooner.</p>	<p>System: Process of care-protocol implementation</p>
<p>Investigators at the BC Injury Research and Prevention Unit based at BCCHR helped develop the BC Falls Risk Assessment and Management Guideline for Older Adults, which was approved by the Ministry of Health’s Guidelines and Protocol Advisory Committee (GPAC) in summer 2021. This guideline provides direction for appropriate clinical responses to a common and preventable medical situation.</p>	<p>Seniors’ fall prevention is a top public health priority in the province. This new guideline satisfies a key recommendation from the BC Injury Prevention Committee, of which the BC Injury Research and Prevention Unit is a member.</p>	<p>System: Process of care standardization and process of care-protocol implementation</p>
<p>A team of researchers, including those at BC Children’s Hospital Research Institute, studied Canadians’ intention to receive a COVID-19 vaccine. They identified factors that predict intentions to be vaccinated against COVID-19, specifically in key priority groups identified by the American Committee on Immunization Practice (ACIP) and the National Advisory Committee on Immunization (NACI) for early immunization.</p> <p>The results show that public health initiatives should focus on developing messages about vaccine safety and benefits delivered by trusted practitioners to optimize vaccine coverage. As certain key populations reported a lower intention to vaccinate, there is a need for in-depth education and support for these communities to ensure optimal uptake.</p>	<p>The success of any COVID-19 vaccine program depends on high vaccine uptake. The results of this study informed the approach to public health messaging around COVID-19 vaccines by provincial and federal agencies.</p>	<p>Patient: Protocols and guidelines</p> 
<p>Parents commonly experience anxiety about their children’s food allergies (FAs). Although FA-specific anxiety screening tools for adult and pediatric patients exist, a tool for parents with children impacted by food allergies is still needed.</p> <p>In 2021-2022, investigators at BC Children’s Hospital Research Institute supervised the development of the Impairment Measure for Parental Food Allergy-Associated Anxiety and Coping Tool (IMPAACT) to measure parental anxiety related to their child’s food allergy. They published a related paper in March 2022.</p> <p>Parent vigilance in daily life remains essential for avoidance of allergens and use of epinephrine for</p>	<p>Researchers have been using IMPAACT in the Food Allergy Immunotherapy Program since 2021.</p> <p>This tool fills a void by reliably and accurately identifying parental food allergy-associated anxiety in ways that other tools cannot.</p> <p>The researchers have also been using this tool in their food allergy immunotherapy research, comparing baseline scores at the start of treatment with scores at various points during treatment.</p> <p>The tool can help quickly determine</p>	<p>Patient: Diagnostic tool</p>

TABLE 2 BCCHR Outcomes (continued)

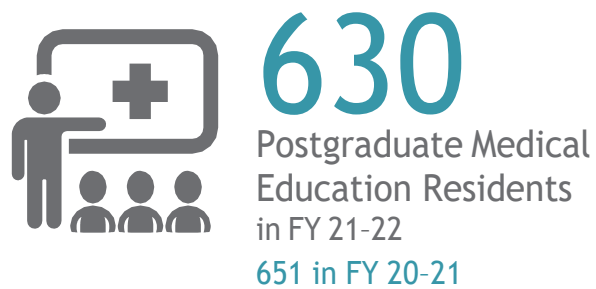
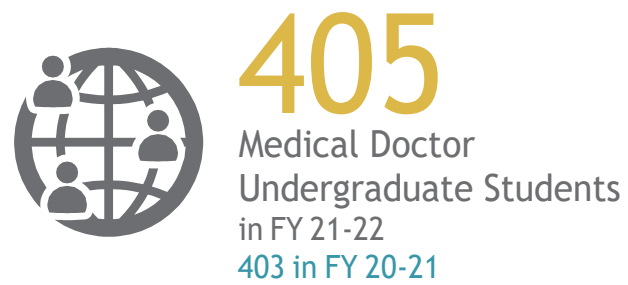
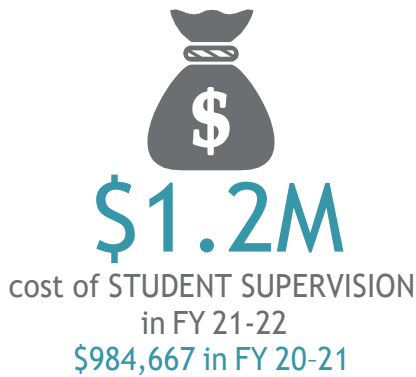
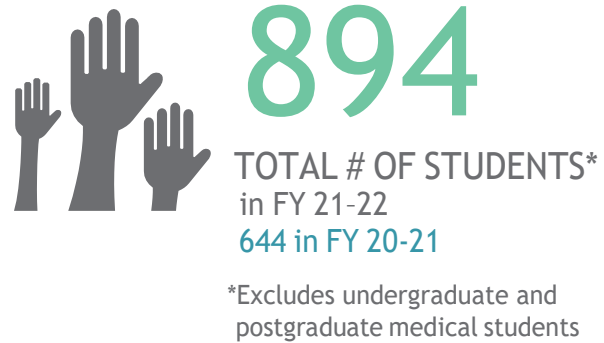
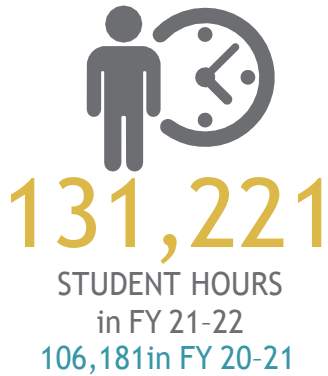
Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ), and COVID-19 Related if icon appears.
<p>accidental exposures. However, long-term elevated levels of parental FA-related anxiety can lead to constant fear, excessive avoidance behaviors, and significant impairment in daily functioning. A parent’s anxiety can also negatively affect the child.</p>	<p>which parents of children with FA need further psychological support.</p>	
<p>Since 2014, the BC Children’s Hospital MRI Research Facility has been part of a team developing advanced myelin water imaging techniques. These techniques are now available to other research groups for brain research.</p> <p>Myelin water images provide a way to measure the amount of myelin along neural fibres in the brain and spinal cord. Myelin insulates nerve fibres and increases conduction of electrical impulses. Without myelin, signalling in the brain becomes a lot slower or non-existent. This makes myelin a good measure of brain health.</p> <p>Myelin does not show up in standard MRI scans. Measuring the water content is a substitute that provides an accurate picture of the health of neurons in the living brain.</p>	<p>New imaging technology developed at the BC Children’s Hospital MRI Research Facility allows better measurement of myelin in demyelinating diseases, such as multiple sclerosis and Alzheimer’s disease, as well as neuronal growth during natural development or following traumatic brain injury.</p> <p>An accurate measure of myelin content has important implications for understanding brain plasticity and neurodegenerative diseases.</p>	<p>Patient: Access to new technology</p>

STUDENT EDUCATION METRICS

BC CHILDREN'S HOSPITAL AND SUNNY HILL HEALTH CENTRE



• • BUILD PRACTICE EDUCATION CAPACITY • • • • •



••• BUILD EFFECTIVE PARTNERSHIPS & COLLABORATION TO SUPPORT INNOVATION •••



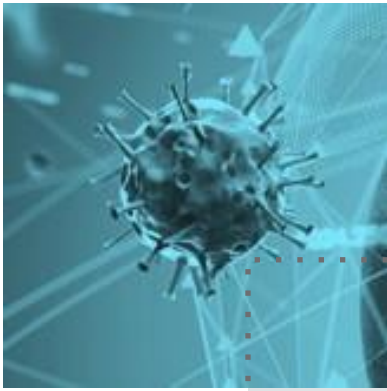
TOP EDUCATION INSTITUTIONS BY
PLACEMENT HOURS in FY 21-22

1. BC Institute of Technology (30,141)
2. University of BC (29,230)
3. Thompson Rivers University (21,180)
4. Douglas College (9,769)
5. Langara College (8,520)



28

of ACADEMIC PARTNERS
WITH AN ACTIVE PLACEMENT
in FY 21-22
18 in FY 20-21



BCMHSUS Research Institute/BC Mental Health & Substance Use Services

RESEARCH METRICS
STUDENT EDUCATION METRICS



RESEARCH METRICS

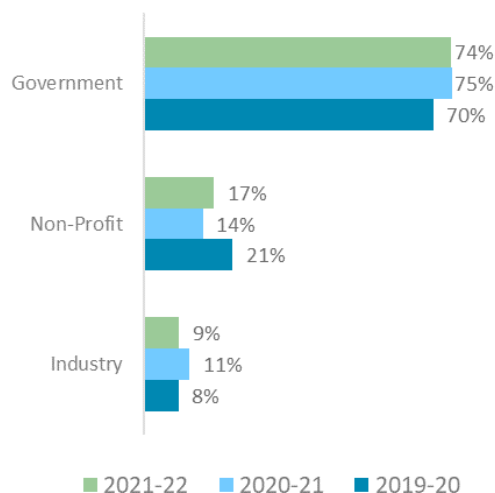
BC MENTAL HEALTH & SUBSTANCE USE SERVICES RESEARCH INSTITUTE

PRODUCING AND ADVANCING KNOWLEDGE

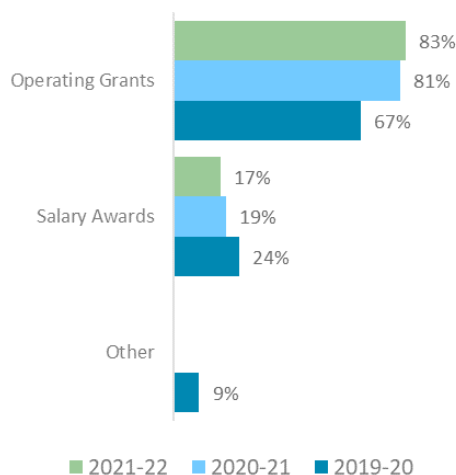
\$1.25 Million

in TOTAL GRANTS AWARDED in FY 21-22
\$1.25 Million in FY 20-21

\$ BY SECTOR



\$ BY AWARD TYPE



151 TOTAL
OF PUBLICATIONS
in FY 21-22
133 in FY 20-21

145
JOURNAL ARTICLES
in FY 21-22
129 in FY 20-21

96%
PEER REVIEWED
in FY 21-22
97% in FY 20-21



50
% of CIHR competitions
above National AVG
SUCCESS RATE
in FY 21-22
0% in FY 20-21



BUILDING RESEARCH CAPACITY

14

OF RESEARCHERS*
in FY 21-22
15.5 in FY 20-21



144

OF TRAINEES
in FY 21-22
191 in FY 20-21

\$106K

RESEARCH SUPPORT
FUND GRANTS
in FY 21-22
\$135K in FY 20-21

HEALTH & POLICY BENEFITS



8

OF CLINICAL TRIALS
in FY 21-22
5 in FY 20-21

596

TOTAL CUMULATIVE
SUBJECT ENROLLMENT
at the end of FY 21-22
551 at the end of FY 20-21



0%



% INDUSTRY FUNDED
TRIALS in FY 21-22
0% in FY 20-21

ECONOMIC BENEFITS & INNOVATION



0

ACTIVE LICENSES
in FY 21-22
0 active (0 new) in FY 20-21

*excluding affiliate investigators

TOP 3 RESEARCH ACHIEVEMENTS BCMHSUS RESEARCH INSTITUTE



Details available in Supplementary Report

1

BCMHSUS Physician Receives Award

Dr. Evelyn Stewart was awarded the 2021 Geoffrey L. Hammond Lectureship for her significant impact on improving the mental health and well-being of children and/or families through the lifespan.

2

BCMHSUS Postdoctoral Fellow Receives Award



BCMHSUS postdoctoral research fellow, Dr. Heather Palis, received a Michael Smith Foundation for Health Research Trainee Award following her UBC Marshall Scholarship award and CIHR fellowship for her research which uses administrative health and corrections data to identify trends of overdose and recidivism among people with criminal justice system involvement and psychiatric disorders in BC.

3

BCMHSUS Researcher Receives Fellowship

Dr. Amanda Butler, under the supervision of Dr. Tonia Nicholls, received the Dr. Elliot Gould Graduate Fellowship in Mental Health Policy, recognizing her demonstrated academic excellence and commitment to mental health policy research.

TABLE 3 BCMHSUS Outcomes

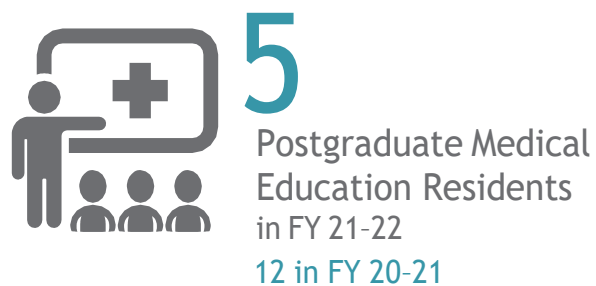
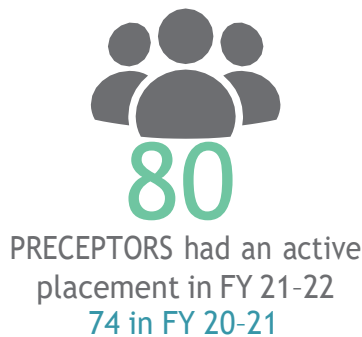
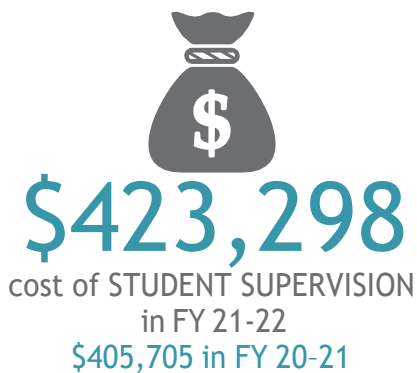
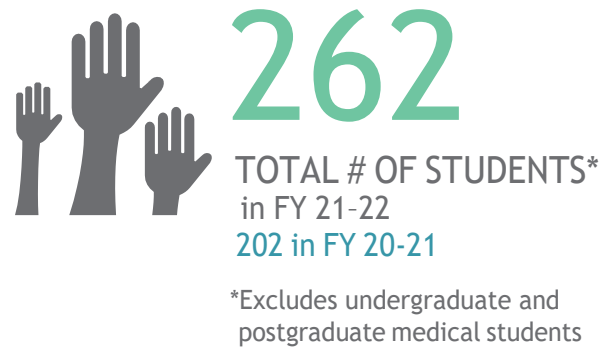
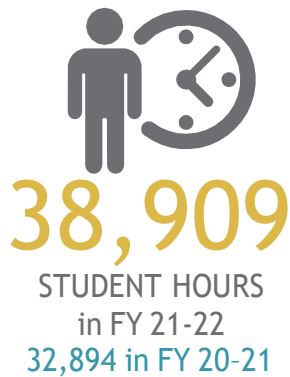
Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ) , and COVID-19 Related if icon appears.
<p>Elevated clozapine levels and toxic effects after SARS-CoV-2 vaccination/</p> <p>We reported on a case of a COVID-19 vaccine-related side effect of clozapine, an important agent used to help those with schizophrenia who have an incomplete response to other antipsychotic medications. As part of this report, we identified a mechanism related to the liver metabolism of clozapine - inhibited by the response to the vaccine and increasing the plasma concentration of clozapine. Subsequently, a report of a large case series from the Netherlands confirmed this finding.</p>	<p>Timely publication of the case from BC alerted clinicians to this possible side effect, and provided practical strategies for mitigation, allowing patients to continue to take clozapine.</p>	<p>Patient: Other - provide province-wide care and consultative support</p> 



STUDENT EDUCATION METRICS

BC MENTAL HEALTH & SUBSTANCE USE SERVICES

BUILD PRACTICE EDUCATION CAPACITY





• • BUILD EFFECTIVE PARTNERSHIPS & COLLABORATION TO SUPPORT INNOVATION • • • • •



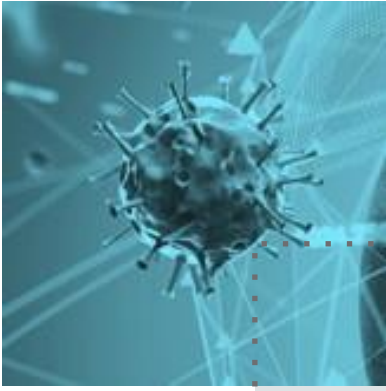
TOP EDUCATION INSTITUTIONS BY
PLACEMENT HOURS in FY 21-22

1. Douglas College (7,810)
2. University of BC (7,613)
3. Kwantlen Polytechnic University (4,306)
4. Langara College (2,880)
5. Adler University (2,100)



26

of ACADEMIC PARTNERS
WITH AN ACTIVE PLACEMENT
in FY 21-22
21 in FY 20-21



BC Centre for Disease Control/UBC CDC

RESEARCH METRICS
STUDENT EDUCATION METRICS

RESEARCH METRICS

BC CENTRE FOR DISEASE CONTROL/UBC CDC



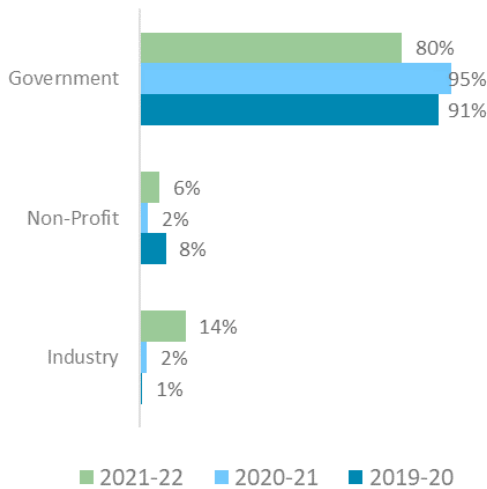
BC Centre for Disease Control
An agency of the Provincial Health Services Authority

PRODUCING AND ADVANCING KNOWLEDGE

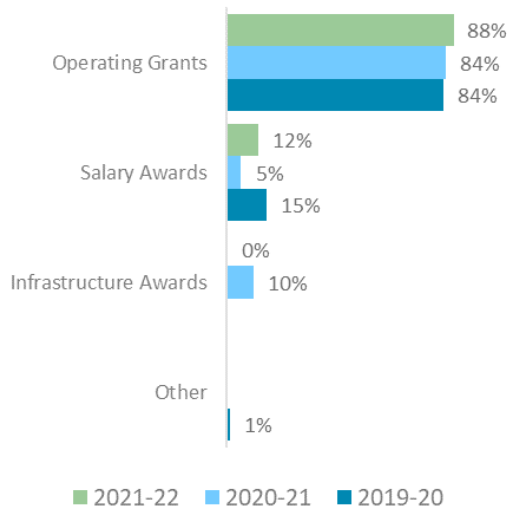
\$5.8 Million

in TOTAL GRANTS AWARDED in FY 21-22
\$7.5 Million in FY 20-21

\$ BY SECTOR



\$ BY AWARD TYPE



301 TOTAL
OF PUBLICATIONS
in FY 21-22
243 in FY 20-21

149
JOURNAL ARTICLES
in FY 21-22
92 in FY 20-21

75%
PEER REVIEWED
in FY 21-22
55% in FY 20-21



50%
% of CIHR competitions
above National AVG
SUCCESS RATE
in FY 21-22
50% in FY 20-21

BUILDING RESEARCH CAPACITY

47.5

OF RESEARCHERS*
in FY 21-22
42.5 in FY 20-21



197

OF TRAINEES
in FY 21-22
90 in FY 20-21

\$ 175K

RESEARCH SUPPORT
FUND GRANTS
in FY 21-22
\$150K in FY 20-21

**Excluding affiliate investigators

HEALTH & POLICY BENEFITS



14

OF CLINICAL
TRIALS in FY 21-22
12 in FY 20-21

3,613

TOTAL SUBJECT
ENROLLMENT
in FY 21-22
1,663 in FY 20-21



0%

% INDUSTRY FUNDED
TRIALS in FY 21-22
0% in FY 20-21

ECONOMIC BENEFITS & INNOVATION

No activity in FY 21-22

TOP 3 RESEARCH ACHIEVEMENTS BCCDC / UBC CDC



Details available in Supplementary Report

1

Tools for Climate Change Adaptation

During the unprecedented heat dome in June 2021, there were an estimated 740 excess deaths across the province. Research on deaths during the heat dome led to the development of the BC Heat Alert and Response System (BC HARS). The BC HARS is a 2-tier alerting system that distinguishes between a Heat Warning (i.e., very hot weather) and an extreme heat emergency (i.e., dangerously hot weather). It supports the use of broadcast intrusive alerting in the event of an extreme heat emergency. Paired with the Extreme Heat Preparedness Guide, both tools will help protect the BC population from the effects of extreme hot weather events in the future.

2

BC Provincial COVID-19 Consent to Contact Registry Database (CCRD)

The registry contains the contact details of people who have previously tested positive for COVID-19 and have given their consent to be contacted about related research. Qualified B.C. researchers can access the registry and connect with participants about research opportunities across the province. Since its launch, the CCRD has recruited over 60,000 British Columbians interested in participating in research and has supported 10 clinical and public health research studies with over 39,500 potential participants. This helped researchers, saving a significant amount of time for recruiting participants. This registry model/framework developed in response to the COVID-19 pandemic can serve as a legacy framework for future rapid response clinical research support.

3

Clinical Research Roles

BCCDC was a key partner in the COVID-19 Clinical Research Coordination Initiative which received the Clinical Trials BC Service & Support Award. This province-wide partnership program created innovative health systems and structures to quickly capture and collate collective feedback enabling the prioritization and coordination of COVID-19. Dr. Mark Gilbert was awarded the Applied Public Health Chair. His work will focus on improving the equity, appropriateness, and sustainability of sexually transmitted and blood-borne infection testing systems through implementation science research. Dr. Troy Grennan received the MSHRBC Health Professional-Investigator award to examine the use of doxycycline as either a daily prevention therapy or an 'after sex' prevention tool for sexually transmitted infections in gay, bisexual, and other men who have sex with men.

TABLE 4 BCCDC Outcomes









Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ) , and COVID-19 Related if icon appears.
<p>Researchers from the BCCDC released a report summarizing how the COVID-19 pandemic disrupted the lives of 18 to 29 year old’s across Canada, and outlined actions to help young adults recover from the pandemic.</p> <p>This report was mentioned in Dr. Bonnie Henry’s letters of support for resumption of in person teaching. This report also supported B.C.’s Return to Campus Public Health Guidance in resuming in-person learning during the winter session.</p>	<p>This report directly influenced policy makers’ decisions in resumption of in-person teaching. The report was largely cited in BC’s Return to Campus Public Health Guidance.</p>	<p>System: Knowledge dissemination-new policy</p> 
<p>Research from the BCCDC regarding SARS-CoV-2 vaccine effectiveness demonstrated the benefits of extending dosing intervals and mixed SARS-CoV-2 vaccine schedules among the general population. Findings showed that two doses of any mRNA and/or ChAdOx1 vaccine combination provided substantial and sustained protection against SARS-CoV-2 hospitalization.</p> <p>Investigators showed that an extended 7-8 week interval between first and second doses improved mRNA protection and may be the optimal schedule outside periods of intense epidemic surge, reinforcing the recommendation to extended dosing intervals.</p> <p>These pivotal findings supported interchangeability and extended intervals between SARS-CoV-2 vaccine doses, with potential for global implications for low-coverage areas and going forward, for children.</p> <p>Preliminary findings among teens and adults have already been presented to BC Public Health Leadership (PHL), the BCIC, Canada’s SAC, and NACI informing the duration of protection and need for additional booster doses in response to the Omicron variant.</p>	<p>Presentation of the interim findings informed decisions by national and international expert committees to recommend 8 weeks as the optimal interval between mRNA doses including by NACI, the WHO, and the United States Centres for Disease Control and Prevention - the latter based upon presentation of these Canadian data at the US Advisory Committee on Immunization Practice publicly-held meeting in February 2022.</p> <p>Preliminary findings among teens and adults have informed duration of protection and need for the additional booster doses in response to the Omicron variant.</p>	<p>Patient: Protocols and guidelines</p> 
<p>BCCDC researchers identified the potential for SARS-CoV-2 virus to mutate in mink, and be passed back to people. Research data also showed concern that mutations could have an impact on vaccine effectiveness.</p>	<p>These findings led to the province of British Columbia to begin a process of phasing out B.C’s mink farming industry due to ongoing public-health risks associated with COVID-19.</p>	<p>System: Knowledge dissemination-new policy</p> 
<p>Research data from the BCCDC Good Samaritan Drug Overdose Act (GSDOA) evaluation project assessed the implementation of the GSDOA and evaluated its effectiveness at increasing bystander response in the event of an overdose by assessing knowledge, attitudes, experiences and intentions regarding the GSDOA in British Columbia.</p>	<p>This research led to training for the RCMP and enforcement around the GSDOA. New slide decks have been created for this training, as a result of research demonstrating low awareness and knowledge of this act.</p>	<p>System: Knowledge dissemination-new policy</p>

TABLE 4 BCCDC Outcomes (continued)

Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSAs researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes ) , and COVID-19 Related if icon appears.
<p>Research from the BCCDC led to development of the first edition of Guidelines for Sexually Transmitted and Blood-Borne Infection (STBBI) testing and linkage to care for individuals who are incarcerated provincially in British Columbia.</p>	<p>This research led to guidance to ensure that care for STBBIs in provincial correctional centres is culturally safe, person-centred and trauma informed.</p> <p>These findings also led to more streamlined and standardized care across all provincial correctional centres in British Columbia.</p>	<p>Patient: Protocols and guidelines</p> <p> BCMHSUS</p>
<p>BCCDC researchers provided significant evidence informing knowledge on tuberculosis (TB) care, screening, laboratory diagnostic work, and many other aspects of public health.</p>	<p>The research produced significant updated guidelines about TB care, screening, and laboratory diagnostics.</p> <ul style="list-style-type: none"> -New recommendations on appropriate dosing of TB drugs -Improved post-TB care based on new recommendations as a result of new evidence -Improved screening outcomes as a result of new recommendations on TB screening in high-risk populations -Improved laboratory protocol and techniques such as new evidence on the use of whole genome sequencing. 	<p>Patient: Improvements in timely access to care</p>
<p>BCCDC researchers published international standards for post-tuberculosis care</p>	<p>BCCDC researchers published international standards for post-tuberculosis care.</p>	<p>Patient: Protocols and guidelines</p>
<p>Research from the BCCDC contributed to The 2021 World Health Organization catalogue of Mycobacterium tuberculosis complex mutations associated with drug resistance: A genotypic analysis</p>	<p>The catalogue produced as a result of this research will enable identification of drug resistant TB to optimize treatment.</p> <p>This will enable more accurate and timely treatment of drug resistant TB strains globally using genomics.</p>	<p>Patient: Improvements in timely access to care</p>
<p>Researchers from the BCCDC conducted a chart review of female infectious syphilis cases diagnosed in BC. This review has been utilized to inform the development of a syphilis prevention and control strategy, particularly to prevent congenital syphilis.</p>	<p>Data resulting from this review aided in prevention and control of syphilis, including the prevention of maternal and congenital syphilis.</p>	<p>Patient: Improvements in timely access to care</p> <p> BCW</p>
<p>Researchers from the BCCDC developed the Mortality Context Application tool to help put COVID-related deaths in context of all deaths that occurred in BC based on years of research and analysis with the provincial vital statistics data.</p>	<p>This tool provides context to provincial mortality statistics, and enables users to download visualizations.</p> <p>Specifically, this tool helps highlight where COVID sits with respect to other causes of death in the BC population.</p>	<p>System: Other type (Information dissemination and knowledge translation)</p> <p></p>

STUDENT EDUCATION METRICS

BC CENTRE FOR DISEASE CONTROL

BUILD PRACTICE EDUCATION CAPACITY



3,674

STUDENT HOURS
in FY 21-22
5,058 in FY 20-21



16

TOTAL # OF STUDENTS*
in FY 21-22
13 in FY 20-21

*Excludes undergraduate and postgraduate medical students



\$52,453

cost of STUDENT SUPERVISION
in FY 21-22
\$84,300 in FY 20-21



5

Medical Doctor
Undergraduate Students
in FY 21-22
13 in FY 20-21



2

PRECEPTORS had an active
placement in FY 21-22
9 in FY 20-21



22

Postgraduate Medical
Education Residents
in FY 21-22
29 in FY 20-21

••• BUILD EFFECTIVE PARTNERSHIPS & COLLABORATION TO SUPPORT INNOVATION •••



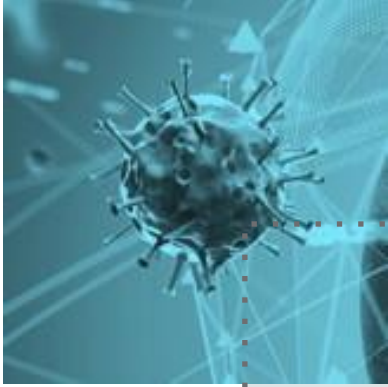
TOP EDUCATION INSTITUTIONS BY
PLACEMENT HOURS in FY 21-22

1. University of BC (853)
2. University of Guelph (840)
3. Simon Fraser University (824)
4. McMaster University (560)
5. University of Toronto (560)



6

of ACADEMIC PARTNERS
WITH AN ACTIVE PLACEMENT
in FY 21-22
4 in FY 20-21



WHRI / BC Women's Hospital & Health Centre

RESEARCH METRICS
STUDENT EDUCATION METRICS

RESEARCH METRICS

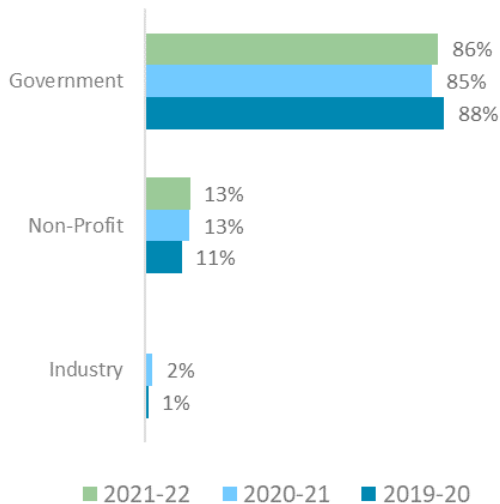
WOMEN'S HEALTH RESEARCH INSTITUTE

..... PRODUCING AND ADVANCING KNOWLEDGE

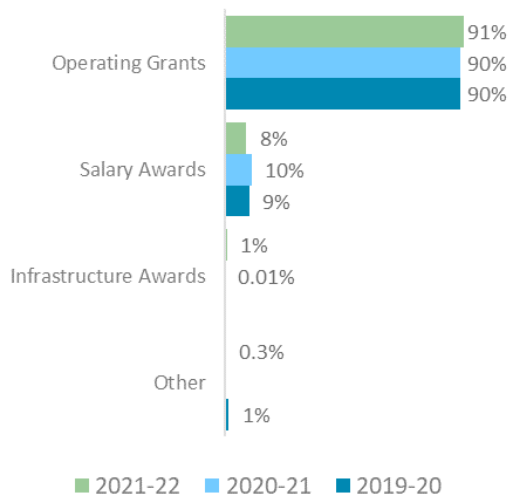
\$9.2 Million

in TOTAL GRANTS AWARDED in FY 21-22
\$5.5 Million in FY 20-21

\$ BY SECTOR



\$ BY AWARD TYPE



1,006 TOTAL
OF PUBLICATIONS in FY 21-22
950 in FY 20-21

490
JOURNAL ARTICLES
in FY 21-22
407 in FY 20-21

97%
PEER REVIEWED
in FY 21-22
98% in FY 20-21



100%
% of CIHR competitions
above National AVG
SUCCESS RATE
in FY 21-22
100% in FY 20-21

BUILDING RESEARCH CAPACITY

465

WHRI MEMBERSHIP
in FY 21-22
401 in FY 20-21



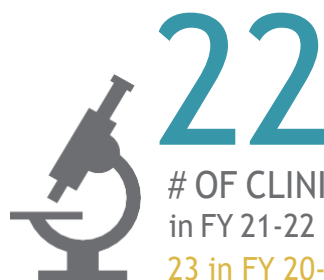
984

OF TRAINEES
in FY 21-22
820 in FY 20-21

\$ 290K

RESEARCH SUPPORT
FUND GRANTS
in FY 21-22
\$155K in FY 20-21

HEALTH & POLICY BENEFITS



22

OF CLINICAL TRIALS
in FY 21-22
23 in FY 20-21

1,941

TOTAL CUMULATIVE
SUBJECT ENROLLMENT
at the end of FY 21-22
1,938 at the end of FY 20-21



14%



% INDUSTRY FUNDED
TRIALS in FY 21-22
8% in FY 20-21

ECONOMIC BENEFITS & INNOVATION

No activity in FY 21-22

TOP 3 RESEARCH ACHIEVEMENTS WHRI



Details available in Supplementary Report

1

The WHRI, BCCHR and BCMHSUSRI have established an Equity, Diversity and Inclusion working group for their research communities

The WHRI, BC Children’s Hospital Research Institute (BCCHR) and the BC Mental Health and Substance Use Services Research Institute (BCMHSUSRI) have jointly established an Oak Street Campus Research Institutes Equity, Diversity, and Inclusion (EDI) Working Group. This joint committee is being co-led by Dr. Lori Brotto, WHRI Executive Director and Dr. Wendy Robinson, BCCHR Associate Director of Research. The purpose of this working group is to support the Oak Street Campus Research Institutes in identifying needs, developing policies, and providing constructive change to instill respect, diversity, equity and inclusion within their communities. While this work still in its initial stages, one of the main aims of this working group is to establish guidelines for EDI activities across the Research Institutes.

2

The WHRI and BCCHR are jointly hosting an online Digital Health education series for the BC research community

The WHRI is collaborating with the BC Children’s Research Institute (BCCHR) to host a joint Digital Health Education Series, which aims to support investigators and trainees engaged in digital health projects and to celebrate innovation in women’s, newborn, and children’s health in BC. The monthly seminar series, which features presentations and workshops from both industry and research experts, was established in order to build capacity and knowledge translation for digital health research and innovation across our research and clinical communities. This virtual learning series engages researchers, care providers, and other stakeholders interested in incorporating digital technologies in a health intervention or health systems process and aims to equip learners to succeed - from project initiation through to implementation.

3






WHRI launched a new multi-stakeholder participatory project to inform guidance for gender-equitable practice within BC’s women’s health research community

WHRI launched a new multi-stakeholder participatory project to inform guidance for gender-equitable practice within BC’s women’s health research community. Co-Led by WHRI Scientific Advisor, Dr. Angela Kaida and patient-partner, Beverly Pomeroy, this project entitled “Beyond the Binary in BC” has mobilized stakeholders across PHSA programs: BC Women’s Hospital + Health Centre, TransCare BC, and BC Children’s Hospital Research, as well as academic institutions (UBC, SFU, and UNBC). The project has created a safe space to discuss a complex topic and has provided a responsive environment. Through collaboration with people from trans, intersex, research, health, ethics, and academic communities, the WHRI is currently developing context-specific resources and recommendations for researchers and health decision-makers to bridge this knowledge gap.

TABLE 5 WHRI Outcomes

Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration, and COVID-19 Related if icons appears.
WHRI researcher was a lead author of a national clinical practice guideline: Surgical Management of Apical Pelvic Organ Prolapse in Women	Improved outcomes for women seeking surgical correction of apical Pelvic Organ Prolapse by improving counselling on surgical treatment options and possible outcomes. Will also provide benefit to surgical providers by improving their knowledge of various surgical approaches.	Patient: Protocols and guidelines System: Knowledge dissemination-new policy
Research findings from a WHRI investigator were used to support the creation of a new clinical practice guideline from the American Society of Clinical Oncology (ASCO): Exercise, Diet, and Weight Management During Cancer Treatment	Improved outcomes for oncology patients, and increased awareness among oncology providers, of the benefits of regular aerobic and resistance exercise during active cancer treatment with curative intent. Research findings from a WHRI investigator on the benefit of exercise to cancer rehabilitation and survivorship provided supporting evidence for development of this guideline.	Patient: Protocols and guidelines System: Knowledge dissemination-new policy
Two WHRI researchers were among the authors of a national clinical practice guideline: Cytomegalovirus Infection in Pregnancy	Improved awareness among perinatal care providers' of the consequences of maternal CMV infection for the fetus and the infant. Improved maternal and fetal outcomes through the use of optimized education to patients about how to prevent CMV acquisition during pregnancy.	Patient: Protocols and guidelines System: Knowledge dissemination-new policy
WHRI researcher launched an online interactive patient decision aid, My Next Birth, in partnership with Perinatal Services BC, BC Women's Hospital and the Provincial Health Services Authority.	Improved maternal and fetal health through evidence-based health care decision-making. This decision aid tool for patients and their health care teams is now the new provincial standard for choosing mode of birth after a previous caesarean. The tool can be accessed at: www.perinatalservicesbc.ca/mynextbirth	Patient: Protocols and guidelines System: Knowledge dissemination-new policy  PSBC and PHSA
WHRI researcher a lead author of a national clinical practice guideline: Female Genital Cosmetic Surgery and Procedures	Improved outcomes for women and systemic cost savings through the recommendation that female genital cosmetic surgery not be offered for non-medical indications due to a lack of rigorous clinical or scientific evidence of efficacy and safety. Improved awareness among health care providers about the role they play in educating women about their anatomy and helping them appreciate individual variations.	Patient: Protocols and guidelines System: Knowledge dissemination-new policy; Efficiency, cost/benefit or sustainability
Research findings from a WHRI investigator were used by the US Food and Drug Administration during their review of regulatory restrictions on the abortion pill. These findings, which showed that abortion remained safe when the abortion pill mifepristone was available as a normal prescription, were considered the highest quality evidence supporting the safety of removing restrictions and resulted in the removal of FDA restrictions on the abortion pill.	Improved outcomes for women and their families due to improved and equitable access to contraception particularly among vulnerable and marginalized women and families in the United States. These same research findings were also included as key evidence of what happens when abortion access is restricted/improved in efforts to rebut the recent US Supreme Court decision overturning Roe v Wade.	Patient: Protocols and guidelines System: Knowledge dissemination-new policy 

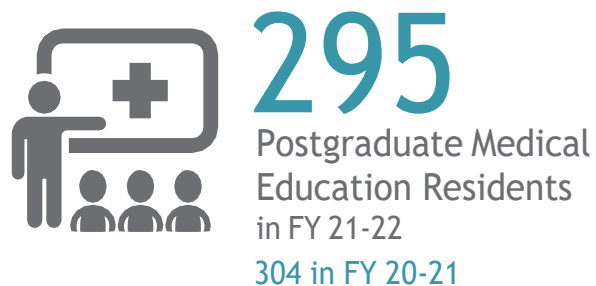
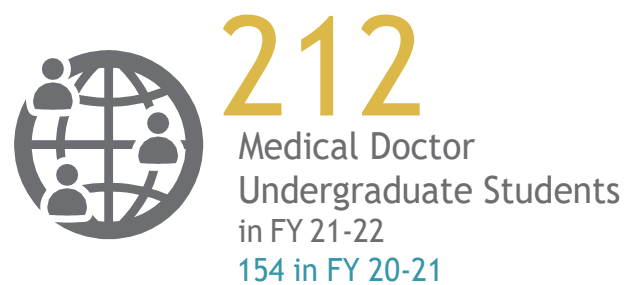
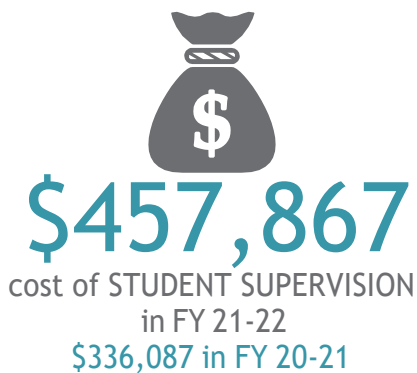
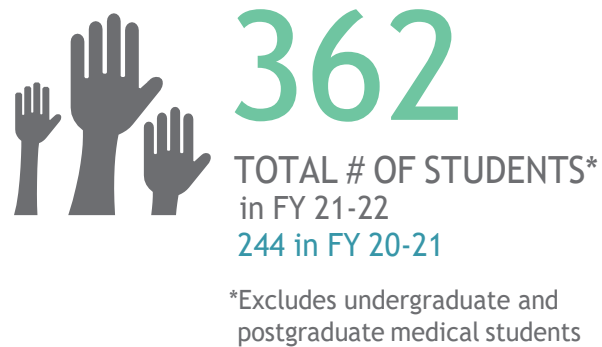
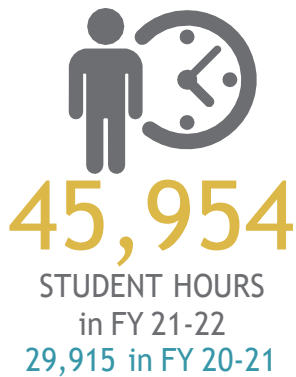
TABLE 5 WHRI Outcomes (continued)

Description of any guideline, drug, diagnostic agent, device or novel and transformational research design or methodology adopted or approved in FY 2021-22 as a result of research driven by PHSA researchers.	Please describe the benefits to patients, population health, and/or health system sustainability of the items identified.	Type of Benefit, Result of Internal Collaboration (if Yes), and COVID-19 Related if icon appears.
<p>WHRI investigator provided research evidence used to support a revision to a national clinical consensus statement: COVID-19 Vaccination in Pregnancy</p>	<p>Based on a national surveillance study conducted by a WHRI researcher that demonstrated that pregnant people are at increased risk of morbidity from COVID-19 infection, this national clinical consensus statement recommends that all pregnant persons should be prioritized to receive a COVID-19 vaccination (i.e., during pregnancy and/or at the time of breastfeeding).</p>	<p>Patient: Protocols and guidelines</p> <p>System: Knowledge dissemination-new policy</p> 
<p>WHRI researcher implemented and evaluated the Concussion Awareness Training Tool - Women's Support Worker module. This concussion toolkit and e-learning course assists care workers who support survivors of intimate partner violence in recognizing brain injury.</p> <p>This initiative was a collaboration with Supporting Survivors of Abuse and Brain Injury through Research (SOAR) and the BC Injury Research and Prevention Unit.</p>	<p>Improved outcomes for survivors of intimate partner violence seeking care through increased recognition and treatment of brain injury. If left unrecognized and unmanaged, concussions and traumatic brain injuries can have long-term consequences. This new toolkit and e-learning course gives support workers evidence-based tools to better support survivors.</p>	<p>Patient: Protocols and guidelines</p> <p>System: Knowledge dissemination-new policy</p>  <p>BC Injury Research and Prevention Unit.</p> 
<p>Three WHRI researchers were co-authors of a national clinical consensus statement:</p> <p>COVID-19 Vaccines and Rare Adverse Outcomes of Thrombosis</p>	<p>While international reports have emerged documenting extremely rare events of arterial and venous thrombosis associated with low platelets following the adenovirus vector COVID-19 vaccines (AstraZeneca, COVISHIELD, Janssen COVID-19 vaccines).</p> <p>However, there is no known association between this syndrome and pregnancy and no physiologic basis to increase this risk in pregnancy. This consensus statement supports the use of all available COVID-19 vaccines approved in Canada in any trimester of pregnancy and during breastfeeding in accordance with regional eligibility.</p>	<p>Patient: Protocols and guidelines</p> <p>System: Knowledge dissemination-new policy</p> 
<p>WHRI researcher was the lead author for the UN Women/World Health Organization's global technical guidance: Improving the Collection and Use of Administrative Data on Violence Against Women.</p>	<p>Administrative data on violence against women is collected when survivors and perpetrators of violence interact with hotlines, police and courts, health systems, shelters, and other services. This Technical Guidance identifies eight steps for improving the collection and use of violence against women administrative data, which is needed to inform the policies and programs developed by governments to prevent and respond to violence against women.</p>	<p>Patient: Protocols and guidelines</p> <p>System: Knowledge dissemination-new policy</p> 

STUDENT EDUCATION METRICS

BC WOMEN'S HOSPITAL & HEALTH CENTRE

BUILD PRACTICE EDUCATION CAPACITY



••• BUILD EFFECTIVE PARTNERSHIPS & COLLABORATION TO SUPPORT INNOVATION •••



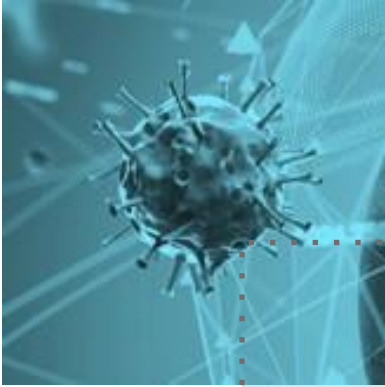
TOP EDUCATION INSTITUTIONS BY
PLACEMENT HOURS in FY 21-22

1. BC Institute of Technology (22,158)
2. University of BC (9,887)
3. Langara College (6,126)
4. VCC (3,024)
5. Kwantlen Polytechnic University (2,847)



11

of ACADEMIC PARTNERS
WITH AN ACTIVE PLACEMENT
in FY 21-22
9 in FY 20-21



BC Emergency Health Services

STUDENT EDUCATION METRICS

STUDENT EDUCATION METRICS

BC EMERGENCY HEALTH SERVICES

• BUILD PRACTICE EDUCATION CAPACITY •



61,668

STUDENT HOURS
in FY 21-22
34,653 in FY 20-21



439

TOTAL # OF STUDENTS
in FY 21-22
249 in FY 20-21



\$2.5 Million

cost of STUDENT SUPERVISION
in FY 21-22
\$1.4 Million in FY 20-21



NA

PRECEPTORS had an active
placement in FY 21-22
155 in FY 20-21

• BUILD EFFECTIVE PARTNERSHIPS & COLLABORATION TO SUPPORT INNOVATION •



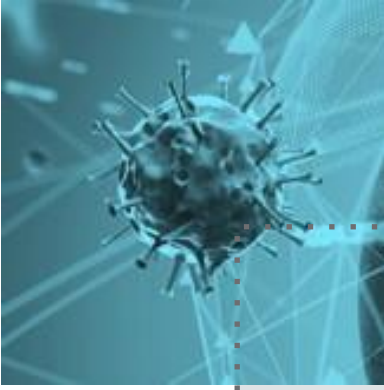
TOP EDUCATION INSTITUTIONS BY
PLACEMENT HOURS in FY 21-22

1. Justice Institute of BC (45,336)
2. Columbia (11,544)
3. Academy of Emergency Training (4,092)
4. HeartSafe EMS (684)



5

of ACADEMIC PARTNERS
WITH AN ACTIVE PLACEMENT
in FY 21-22
5 in FY 20-21



PHSA Registries & Datasets

RESEARCH METRICS

RESEARCH METRICS

REGISTRIES & DATASETS

Registries are the result of significant infrastructure investment in the collection of longitudinal data that are regional, provincial or national in scope regarding provision of services to specific population(s), maintained for the purposes of undertaking analysis, surveillance and/or research.

REGISTRY/DATASET DESCRIBED



REGISTRY/DATASET USES



TOP3 RESEARCH SUPPORT ACTIVITIES

1. Identifying Knowledge Gaps & Improvement Needs
2. Managing & Linking Data
3. Design of Research Studies



NATURE OF RESEARCH ACTIVITIES



TABLE 6 These are examples of the types of research questions posed by investigators using data from PHSA registries and datasets in FY 21-22.

BCCH's Biobank	Childhood Leukemia: transcriptomics-based point of care rapid diagnosis
	Enhanced immune monitoring in pediatric kidney transplant recipients
	Biomarker development for clinical diagnosis of stage and response to treatment in inflammatory bowel diseases
	Prevalence of A1AT deficiency variant alleles in pregnancies affected by COVID-19 syndrome.
	Epigenetics of OCD in response to CBT treatment
BC Cardiac Registry	Comparative Clinical Outcomes of Redo Mitral Valve Replacement vs Transcatheter Mitral Valve-in-Valve for Failed Tissue Valves. Study objectives are to compare early and late clinical outcomes following transcatheter mitral ViV vs. surgical redo mitral valve repair and to determine risk factors for 30-day mortality and long-term survival following each.
	Qualitative and quantitative analysis of chronic pain following open heart surgery - local site surgical program seeking patient cohort details of those undergoing cardiac surgery during a set time window. With ethics approval, research team then contacted patients and invited them to participate in the research study which was to involve a structured interview associated with pain and pain management practices following surgery. Also provided data variables to support quantitative analysis.
	Decision making for management of CAD in patients with chronic kidney disease: validation of predictive models to inform clinical decision-making tools. Patient cohort created from PROMIS and CSBC.
	CABG-PATCH - Coronary Artery Bypass Grafting: P2Y12 inhibitors and ACEI/ARBS to corroborate health outcomes - (UBC Pharmacy) - Seeking to understand whether use of two different classes of medication post cardiac surgery is associated with a reduction in death and major adverse cardiovascular events. Linkage at PopDataBCI; CSBC provided cardiac surgery population, clinical factors, and cardiac specific outcomes.
	Cardiac CT Angiography and High-sensitivity Cardiac Troponin - Overall, we hypothesize that use of CCTA in patients presenting with chest pain and low-grade hs-cTnT elevation improves patient outcomes and changes downstream treatment. More specifically, we hypothesize that CCTA will have an important role in the semi-acute setting in the detection of coronary artery disease, optimised downstream medical care and improve patient's outcomes. We also hypothesize that CCTA will allow risk stratification of patients into those in need of invasive coronary angiogram and those who does not, mitigating the risks associated with invasive coronary angiography.
	Artificial intelligence empowered cardiac ultrasound for the management of acute coronary syndrome. - Our goal is to develop a state-of-the-art artificial intelligence-based software that can augment the interpretation of point-of-care cardiac ultrasound in patients with old or new heart attacks by automatically identifying wall motion abnormalities. In addition to the detection of imaging abnormalities, we plan to extend the model for the prediction of major outcomes such as the likelihood of requiring a stent, coronary artery bypass surgery, and even death in patients who present with heart attacks.
EPPIC	Among women with endometriosis undergoing endometriosis surgery, does a negative sliding sign compared with a positive sliding sign at pre-surgery dynamic ultrasound increase the risk of complications at surgery?
	What is the prevalence of patients with endometriosis associated pelvic pain found progesterone treatment/GnRha ineffective for their pain or they discontinued due to side-effects?
	Among women with diagnosed endometriosis, what are the differences in clinical characteristics between patients who have pelvic pain worsened during or after orgasm compared to those whose pelvic pain is unchanged by orgasm?
Breast Cancer Screening Database	What is the performance of AI systems for breast cancer detection using digital mammograms.
	Can a federated learning approach be used to train and validate an Artificial Intelligence (AI) algorithm for breast cancer detection using digital mammograms from the BC Cancer Breast Screening Program.

TABLE 6 Example Research Questions by Registry/Dataset (continued)

PROMIS-Renal	Vaccine effectiveness in CKD non dialysis patients
	Vaccine effectiveness in Dialysis patients
	Incidence of new GN or flares of GN post covid vaccine or covid infection
	Cost effectiveness of SGLT2i in real world setting CKD patients with and without diabetes
	Impact of COVID on Kidney Care clinic outcomes: description of long-term impact on transitions in care
PROMIS - Transplant Registry	Would a home-based exercise pre-habilitation program prior to kidney transplantation result in improved functional outcomes including the 6-minute walk test, 60-second timed sit to stand, Fried Frailty Score, quality of life and fatigue. Would this result in improved outcomes regarding post-operative recovery, complication rate, length of stay and mortality?
	Will living donors with low renal reserve prior to donation manifest histological abnormalities on their post-implantation biopsy and experience a greater drop in GFR after donation compared to living donors with high renal reserve.
	Would a new biomarker test negate the need for biopsies and allow personalization of therapy, permitting adjustment for each patient according to reliable markers of biological activity?
	What is the deceased donor potential for pediatric patients in Canada?
	What are the health system "gaps" in patients with liver disease and HCC during their treatment journey?
	Determine the ability of non-contrast CT scans to assess and grade hepatic steatosis in a deceased-donor population in British Columbia.
	A BC wide program for Rural, Remote, and Indigenous communities to Gain Equitable Access to Kidney Transplantation: The BRRIDGE to Transplantation Initiative (BRRIDGE Study)
	What is the specific humoral and cellular response after the approved COVID-19 vaccine is administered in a SOTr and healthy adult population?
	Understand compassion fatigue, burnout, and moral distress among Organ and Tissue Donation Coordinators to inform strategies that will optimize Organ Donation Organizations performance.
	Determine the efficacy, safety, and pharmacokinetics of BIW020 for the prevention and treatment of antibody-mediated rejection in adult kidney transplant recipients.
BCCDC - COVID-19 Dataset	How does the population burden of COVID-19 with regards to hospitalizations compare to previous influenza seasons?
	What is the effectiveness of COVID-19 vaccines against infections and severe outcomes?
	What is the safety of COVID-19 vaccines and what sub-populations are at higher risk of adverse events?
	How can health services data be used as syndromic surveillance of COVID-19 transmission?
	How does COVID-19 severity differ by variants of concern?
	What was the indirect impact of the COVID-19 epidemic on mental health and emergency department visits?
	What are the risk factors associated with risk of death during the heat dome?
Tumour Tissue Repository	Resolving tumor and immune cell architecture in ovarian cancer using spatial transcriptomics.
	Isolation of the gut microbiota from biobanked colorectal cancer tissues.
	Metabolic tracing of tumour and T cells in the ascites of ovarian cancer patients.
	Autophagy Regulation of Effector T Cell Metabolism and Survival.

TABLE 6 Example Research Questions by Registry/Dataset (continued)

Perinatal Services BC	Is there a relationship exists between vaginal bleeding < 20 wks GA and live birth rate? Is there a relationship between vaginal bleeding < 20 wks GA and risk of maternal and neonatal complications? Is there a relationship between vaginal bleeding < 20 wks GA in patients undergoing IVF separately?
	What is the interaction between the BCEA program and the AYA population? What is the interaction between educational system and the AYA population? What is the interaction between the health care system and the AYA population?
	Do pre-cancer treatment rates differ between groups who have received one or two rounds of HPV testing followed by cytology screening? Do perinatal outcomes differ between groups who have received zero, one, or two rounds of HPV testing in conjunction with cytology screening? Which perinatal outcomes are related to each HPV positivity and/or subsequent treatment for precancerous lesions?
	Assess early childhood mortality and severe morbidity among children born with and without NAS and to identify risk factors associated with elevated risk of mortality and severe morbidity. Compare developmental outcomes at kindergarten using the Early Development Instrument (EDI) in children with and without a history of NAS; and, to assess associations between demographic and environmental factors (e.g., neighbourhood socioeconomic status) and developmental vulnerability (defined as low EDI scores) specifically in children with NAS. Assess sex differences in hospitalization, morbidity, and developmental outcomes among children with and without NAS.
	Are there important differences in pregnancy outcomes in COVID-19 affected pregnancies compared to pregnancies pre-pandemic?
	What is the prevalence of the methods of delivery for term pregnancies in occiput posterior (OP) malposition for the patient population of British Columbia? What are the rates of maternal and neonatal/fetal adverse outcomes, stratified by delivery method for persistent OP position?
	To measure any respiratory distress or in-hospital newborn mortality, moderate to severe respiratory distress (requiring endotracheal intubation or positive pressure ventilation) or in-hospital newborn mortality (secondary outcome); and other major neonatal morbidity or in-hospital newborn mortality (secondary outcome).
	How does one's status as an im/migrant woman to Canada (e.g., migration class, place of origin, language) affect need for and experiences with SRH services? What are the key barriers and facilitators that im/migrant women describe as shaping their access to SRH services? How might intersecting structural experiences such as racialization, language barriers, or social support influence SRH access, and to what extent does this vary by type of SRH service (e.g., contraception, maternity care, sexual health screenings), if at all? What changes in SRH services access do im/migrant women experience over the course of arrival and settlement in BC, if any? What are the perceived factors contributing to these changes (e.g., health insurance, language barriers, health system interactions, social support and isolation), and to what extent do these vary across marginalized subgroups of im/migrant women? What are the mechanisms through which changes in federal immigration policies and municipal practices are perceived to influence barriers and facilitators to SRH services (e.g., maternity care, HPV screening, STBBI testing) for im/migrant women, if at all? Do these impacts vary based on the experiences of marginalized subgroups (e.g., precarious legal status)? In what ways do changes to health system policies and practices (e.g., interpretation services, type of service delivery model) influence im/migrant women's access to and experiences with SRH services, if any? To what extent are these changes perceived to address im/migrant women's needs?

TABLE 6 Example Research Questions by Registry/Dataset (continued)

Perinatal Services BC (continued)	Is BMI associated with HELLP syndrome?
	Is in utero exposure to wildfire smoke associated with adverse birth outcomes? Is in utero exposure to wildfire smoke associated with increased risk of adverse health outcomes in the first year of life? Is exposure to ambient wildfire smoke during the critical neonatal period (birth to 28 days) associated with increased risk of adverse health outcomes in the first year of life?
BCEHS Paramedic System Evaluation and Research Database (PSERD)	What is the Acuity of patients contacting 911 with dyspnea during COVID-19
	What are the effects of targeted temperature management on outcomes in OHCA
	What are the processes and reasons for withholding resuscitation efforts in OHCA
	What are Canadian Community Paramedics perception on education and preparation for practice
	What are Critical Care Paramedic perceptions of risks and management strategies during an inter-facility transport of psychiatric patients in an aeromedical environment ^{SEP}
BC Cancer Registry	Determining clinical outcomes and treatment patterns in Urothelial carcinoma.
	Investigating the Real-World Benefit of maintenance PARP inhibitor (i) therapy in the first-line setting
	Management of Recurrent Sinonasal Melanoma in British Columbia: A Comprehensive Review
	Real-World Outcomes for Metastatic Breast Cancer in British Columbia
	Rural-Urban Divide in Breast Cancer Diagnosis and Treatment
	Causes of Death in Older patients with high-risk breast cancer
	The Impact of COVID-19 on Lung Cancer Stage at Diagnosis, and Implications for Treatment
	Outcomes of patients with glioblastoma in British Columbia during the COVID-19 pandemic
	Comparison of breast cancer recurrence and outcome patterns by age in patients treated between 2000 and 2017
The EARLY study: Economic evaluation of a novel prostate cancer glycan-based diagnostic tool	
Lung Cancer Screening Program	Management of screening LDCT detected lung nodules
	Radiomic studies of screening LDCT
Cervical Cancer Screening Program	To understand downstream outcomes for certain patient types
BC Trauma Registry	The primary study objective is to assess whether a mortality difference exists between major trauma patients because of a difference in Helicopter EMS or Ground EMS care and transport.
	The purpose of the study is to examine the Trauma database at BCCH to understand the epidemiology, and direct costs to the healthcare system surrounding unintentional falls from buildings in the children of BC. We hypothesize that a significant proportion of unintentional falls arise from preventable circumstances and that initiatives designed to address these situations stand to avert harm to children and minimize associated healthcare expenditures.
	The purpose of this study is to describe the patterns of intubation of acute burn patients presenting to VGH, with a specific aim to explore rates and risk factors for short-term intubations. We are proposing a retrospective cohort study of intubation practice patterns of acute burn patients treated in our tertiary burn centre at Vancouver General Hospital (VGH).
	The objectives of this research project shall be: [1] to evaluate the epidemiology of trauma sustained by pregnant patients in the province of British Columbia; [2] to review the imaging findings of the aforementioned traumatic injuries sustained by pregnant patients in the province of British Columbia, with particular emphasis on the imaging findings of obstetrical complications arising from trauma (ex. internal hemorrhage, placental abruption, uterine rupture); [3] to determine the frequency of computed tomography (CT) and ultrasound imaging obtained by pregnant patients who sustain traumatic injuries in the province of British Columbia prior to procedural or surgical intervention; and, [4] to characterize the nature of imaging obtained by pregnant patients who sustain traumatic injuries in the province of British Columbia (ex. imaging modality; whole body versus targeted imaging).

TABLE 6 Example Research Questions by Registry/Dataset (continued)

BC Trauma Registry (Continued)	We would like to investigate the current access and utilization of angiography and angioembolization for our polytrauma patients with pelvic fractures and hemodynamic instability. By searching through the trauma database for these patients and then performing a manual chart review, we can find how long it took to access angiography resources, how long any subsequent procedures take, blood loss/blood transfusions required, outcomes such as length of admission, complications, and mortality. There are other similar benchmarking studies done in major North American trauma centres which we can compare our findings with and see if there are any needs to be addressed based off our current standards of practices.
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APPENDIX 1

RESEARCH METRICS WORKING GROUP MEMBERSHIP*

Ellen Chesney
Chief Administrative Officer - Research, PHSA

Isabelle Linden
Research Services, BCCHR

Kathryn Dewar, PhD
Senior Research Manager, Women's Health Research Institute (WHRI)

Elaine Yong
Manager, Communications, BCCHR

Rhonda Ellwyn
Manager, Research Operation, BCMHSUS

Karen Hagan
Grants Officer, Office of Research Facilitation, BC Cancer

Nechelle Wall
Paramedic Practice Leader, BCEHS

Kelly Chan
Finance Manager, BCCHR

Beth Palacios
Consultant

Deborah Ross
Director, Research and Knowledge Exchange
BC Mental Health & Substance Use Services

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

*As of September, 2022

APPENDIX 2

FRAMEWORK FOR PHSA RESEARCH METRICS

1. Indicator: Producing and Advancing Knowledge

This category includes measures reflecting discoveries/new knowledge, and contributions to scientific literature.

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

2. Indicator: Building Research Capacity

This category includes measures reflecting enhancements to both human resource and infrastructure capacity.

- a. Total # trainees by agency/research entity
- b. Scholarships/fellowships by agency/research entity
- c. Total # researchers by agency/research entity
- d. Infrastructure investments
 - i. E.g. - hospital research fund, BCCHR, capital projects etc.
 - ii. Databases (patient, tissue) etc
- e. Research Support Fund grants

3. Indicator: Achieving Economic Benefits and Innovation

This category includes measures reflecting commercialization of discoveries, revenues and other economic benefits resulting from discoveries, and general impacts on the BC economy.

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

4. Indicator: Advancing Health and Policy Benefits

This category includes measures reflecting individual and population health impacts of research in prevention, diagnosis and treatment.

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

APPENDIX 3

FRAMEWORK FOR PHSA STUDENT EDUCATION METRICS

1. Indicator: Build Practice Education Capacity

This category includes measures that demonstrate level of commitment to students, preceptors, and post-secondary institutions as part of mandate to provide excellence in education and training.

- a. # of Students, Placement Hours by Discipline & Sub-Discipline
- b. # of Medical Students (Under-grads and Post-grads) by Specialty
- c. Estimated Cost of Staff Time by Encounter Type
- d. # of Confirmed Placement Requests by Month
- e. # of Confirmed and Declined Placements by Educational Institution for Priority Professions
- f. # of Declines by Reason (Most Frequent)
- g. # of Staff Participants in Preceptor/Educator Training
- h. # of Preceptors in HSPnet With and Without a Placement

2. Indicator: Build Effective Partnerships and Collaborations that Support Innovation

This category includes quantitative measures of PHSA's relationships with academic partners.

- a. # of Affiliation Agreements by Region and Sector
- b. Top % of Education Institutions by Student Hours
- c. Distribution of Student Hours by Practice Education Setting

3. Monitor the Quality of the Clinical Learning Environment and Results

This category includes measures for monitoring quality and outcomes.

- a. # of hires at PHSA with a previous placement
- b. # of Placements by Educational Institution for New Hires

APPENDIX 4

STUDENT EDUCATION COORDINATING COMMITTEE

Current Membership

Ellen Chesney ¹	Chief Administrative Officer - Research & Academic Services, Executive Sponsor
Ryan Ackerman ⁷	Senior Leader, Practice Education
Annalies Becu ⁸	Co-Chair, Manager, Public Health
Christie Diamond ¹	Co-chair, Corporate Director, Academic Education
Justine Dodds ²	Inter-Professional Practice Director
Sandra Harris ^{4,5,6}	Senior Leader, Clinical Education, Learning & Development
Siwon Kim ¹	Collaborative Practice Leader
Yujin Lim ¹	Collaborative Practice Leader
Jennifer Molhoj ⁷	Manager, Program Support & Learning
Neeta Nagra ²	Director, Professional Practice, Forensic Hospital
Sandy Tatla ^{4,5,6}	Director, New Knowledge & Innovation
Sarah Titcomb ¹	Coordinator - Academic Development
Christina Tsobanis ¹	Collaborative Practice Lead, Allied Health
Heena Vadgama ³	Education Coordinator
Sylvia Wu ⁴	Manager, Education, UBC Dept. of Pediatrics

1. PHSA corporate services
2. BC Mental Health and Substance Use Services
3. BC Cancer Agency
4. BC Children's Hospital
5. BC Women's Hospital and Health Centre
6. Sunny Hill Health Centre for Children
7. BC Emergency Health Services
8. BC Centre for Disease Control
9. Lower Mainland Pathology and Laboratory Medicine