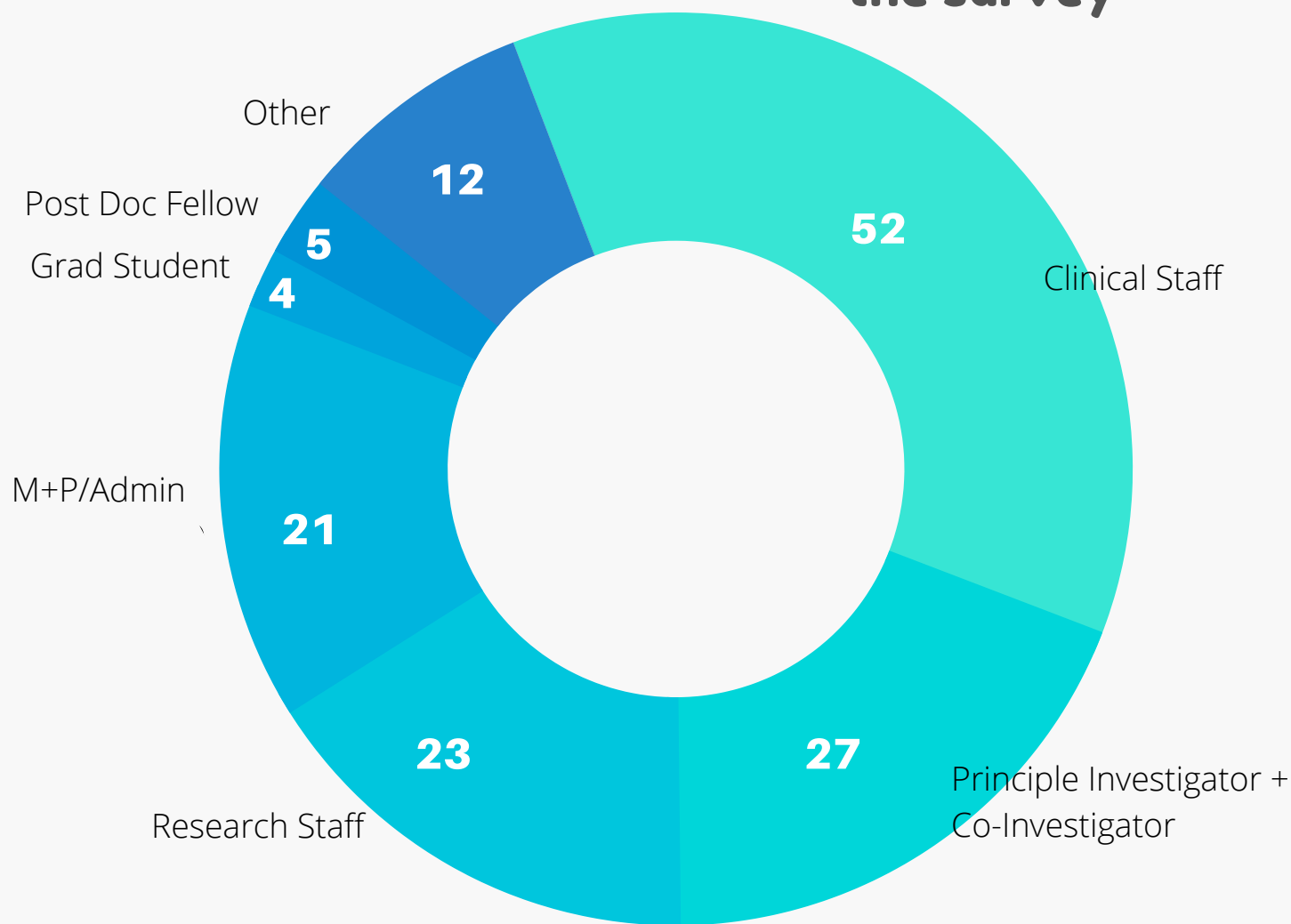NOVEMBER 2019

DIGITAL HEALTH SURVEY REPORT

BC WOMEN'S HOSPITAL AND THE WOMEN'S HEALTH RESEARCH INSTITUTE

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WHICH OF THE FOLLOWING BEST DESCRIBES YOUR RELATIONSHIP WITH BC WOMEN'S HOSPITAL AND/OR THE WOMEN'S HEALTH RESEARCH INSTITUTE?

145
participants completed or partially completed the survey

Other — 12

Post Doc Fellow — 5

Grad Student — 4

Clinical Staff — 52

M+P/Admin — 21

Research Staff — 23

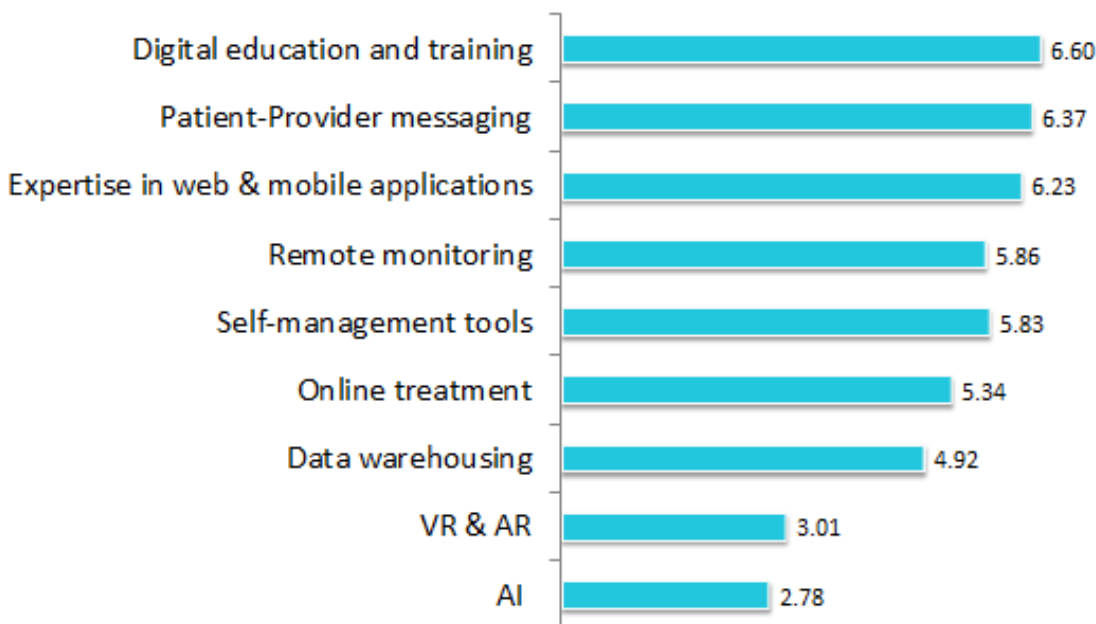Principle Investigator + Co-Investigator — 27

1. Participants self-identified as one of the categories outlined in chart above
2. 'Other' category included; policy makers, PHSA corporate employees, affiliated members of WHRI, KT & evaluation specialists

PLEASE RANK IN ORDER OF PREFERENCE THE AREAS YOU FEEL WOULD BE MOST VALUABLE FOR BCWH AND WHRI TO FOCUS ON IN A DIGITAL HEALTH STRATEGY

AVERAGE RANKING

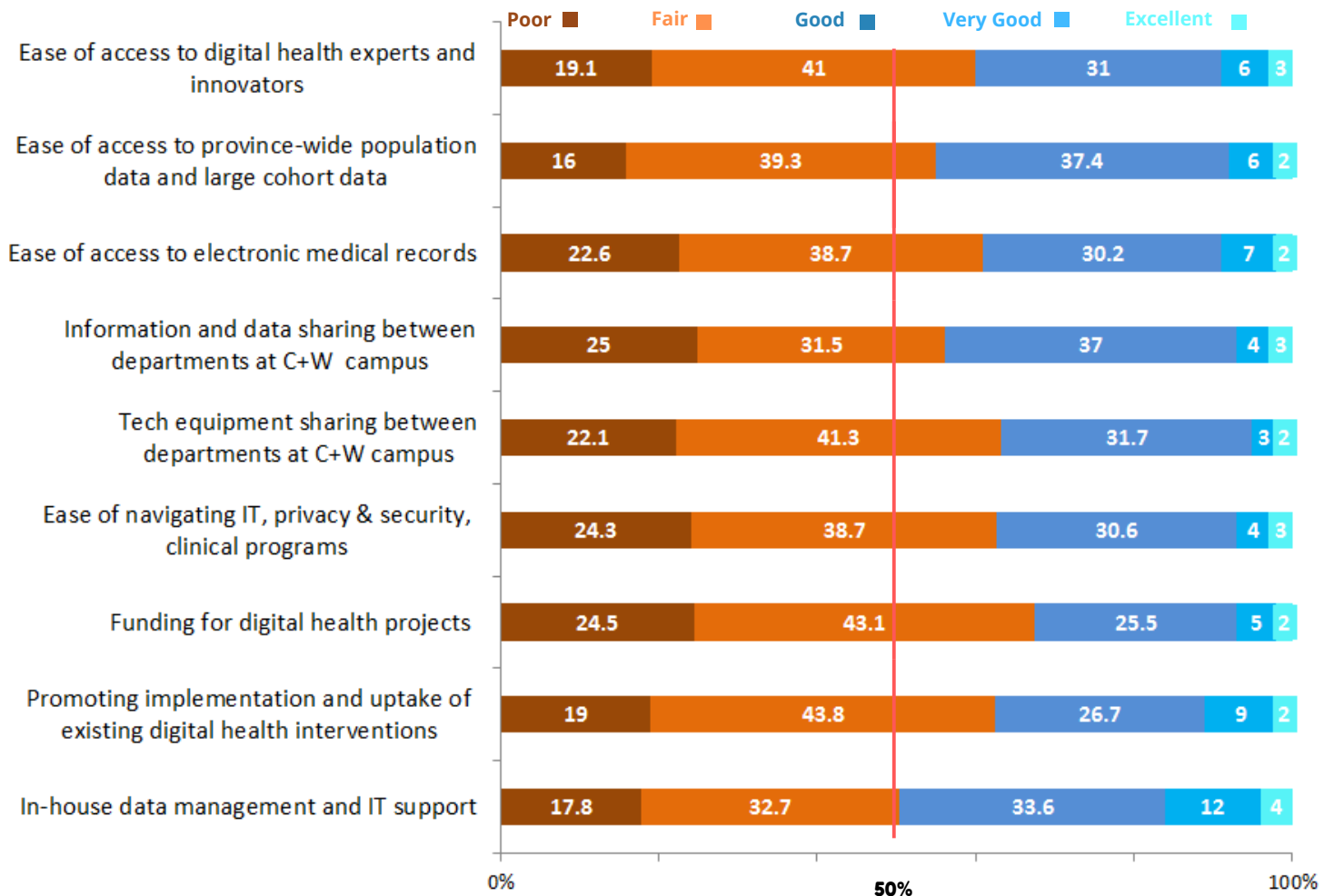**Respondents ranked nine items from 1st choice to 9th choice**

Ranking questions calculate the average ranking for each answer choice so you can determine which answer choice was most preferred overall. The answer choice with the largest average ranking is the most preferred choice.

In this survey most people ranked digital education and training as one of their top preferred choices.

Item	Average Ranking
Digital education and training	6.60
Patient-Provider messaging	6.37
Expertise in web & mobile applications	6.23
Remote monitoring	5.86
Self-management tools	5.83
Online treatment	5.34
Data warehousing	4.92
VR & AR	3.01
AI	2.78

1. Digital education and training - online education and training for staff, including simulation technologies
2. Patient-Provider messaging - messaging in the form of email or text through online platforms
3. Expertise in web & mobile applications - expertise in web and app development
4. Remote monitoring - devices and platforms which allow patient data to be monitored remotely
5. Self-management tools - platforms/interventions which facilitate patients to self-manage aspects of their condition
6. Online treatment - delivery of treatment using web enabled methods e.g. CBT and virtual consultations
7. Data warehousing - electronic storage of large amounts of data from varied sources into one comprehensive database
8. VR+AR- Virtual reality offers a digital recreation of a real life setting, augmented reality adds virtual elements as an overlay to the real world. Both are popular approaches to pain management research.
9. AI- Artificial Intelligence is the simulation of human intelligence processes including thinking and learning by machines, especially computuer systems

THE FOLLOWING IS A LIST OF TOOLS INVOLVED IN DOING DIGITAL HEALTH. PLEASE RATE HOW YOU FEEL BC WOMEN'S AND WHRI ARE DOING AT EACH

	Poor	Fair	Good	Very Good	Excellent
Ease of access to digital health experts and innovators	19.1	41	31	6	3
Ease of access to province-wide population data and large cohort data	16	39.3	37.4	6	2
Ease of access to electronic medical records	22.6	38.7	30.2	7	2
Information and data sharing between departments at C+W campus	25	31.5	37	4	3
Tech equipment sharing between departments at C+W campus	22.1	41.3	31.7	3	2
Ease of navigating IT, privacy & security, clinical programs	24.3	38.7	30.6	4	3
Funding for digital health projects	24.5	43.1	25.5	5	2
Promoting implementation and uptake of existing digital health interventions	19	43.8	26.7	9	2
In-house data management and IT support	17.8	32.7	33.6	12	4

0%   50%   100%

65-67%

feel the areas for greatest improvement are
- **Funding for digital health**
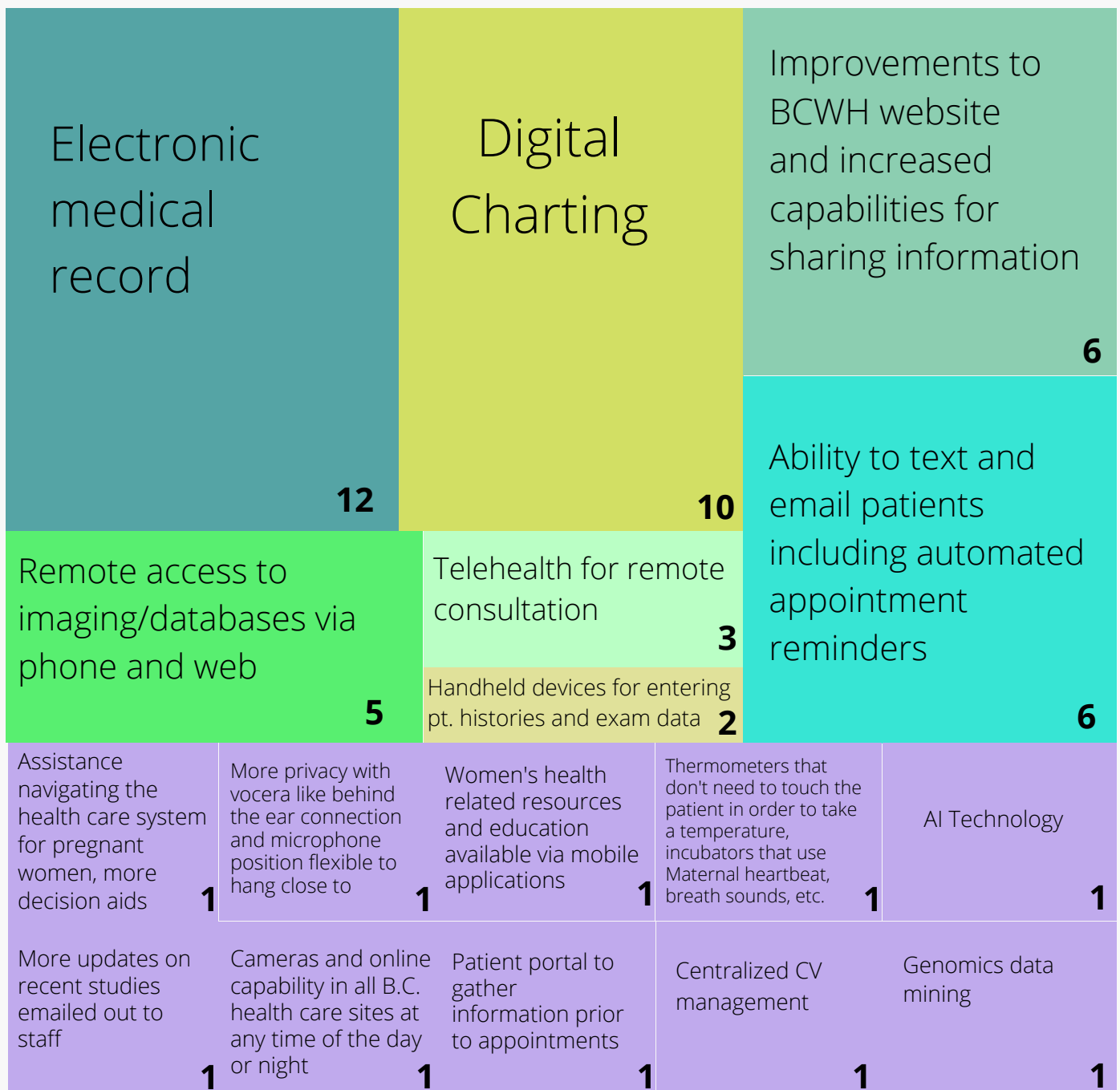- **Navigating IT, privacy and security, and clinical programs**

50%

feel we are doing well at
- **In-house data management and IT support**
- **Access to big data cohorts**

WHAT TECHNOLOGY DEVELOPMENTS WOULD YOU LIKE TO SEE AT BC WOMEN'S HOSPITAL AND THE WOMEN'S HEALTH RESEARCH INSTITUTE?

Tree map showing survey responses from clinical staff

Electronic medical record
12

Digital Charting
10

Improvements to BCWH website and increased capabilities for sharing information
6

Ability to text and email patients including automated appointment reminders
6

Remote access to imaging/databases via phone and web
5

Telehealth for remote consultation
3

Handheld devices for entering pt. histories and exam data
2

Assistance navigating the health care system for pregnant women, more decision aids
1

More privacy with vocera like behind the ear connection and microphone position flexible to hang close to
1

Women's health related resources and education available via mobile applications
1

Thermometers that don't need to touch the patient in order to take a temperature, incubators that use Maternal heartbeat, breath sounds, etc.
1

AI Technology
1

More updates on recent studies emailed out to staff
1

Cameras and online capability in all B.C. health care sites at any time of the day or night
1

Patient portal to gather information prior to appointments
1

Centralized CV management
1

Genomics data mining
1

WHAT TECHNOLOGY DEVELOPMENTS WOULD YOU LIKE TO SEE AT BC WOMEN'S HOSPITAL AND THE WOMEN'S HEALTH RESEARCH INSTITUTE?

Table showing survey responses from research staff

DIGITAL INNOVATION HUB	• Innovation lab for AI and machine learning • Access to digital health training opportunities and expertise in web development, human factors, machine learning • Tangible resources: recommended industry vendors, guidelines on digital health project life cycle, language guide for industry, guidelines for assessing the legitimacy and scientific integrity of existing digital health technology for patients and physicians • Established partnerships across campus and PHSA related to digital health, OVH, IMITS, • Network and advocacy building of stakeholders/researchers in this space. • Established partnerships with Industry e.g.e Telus Health • Funding /Awards for digital health projects. Both seed funding and implementation
DATA ACCESS	• Capabilities to extract from medical devices + electronic medical record • Interoperability of existing databases and systems • Deployment of CST • Create Infrastructure for Big Data • Unified strategy for data collection storage & access across campus and with both C+W research institutes • Email field in Cerner
RESEARCH PORTALS	• One provincial clinical data collection platform that allows for a patient portal and data access request for research and QI projects. • More online portals for patients and research participants to access and submit and complete documents
ADOPTION & IMPLEMENTATION	• Invest in supporting and sustaining what has already been done well e.g. Provincial Medical Genetics Program • Funding for implementation • Promotion of existing solutions and ongoing work. • PRIME space (promotion + optimization)
PATIENTS	• Well resourced patient advisory groups and advocates representing all women's health issues • Blanket permission from patients to conenct with them via email/phone for research/QI projects
SOFTWARE & HARDWARE	• Research software that is accessible and affordable; Tableau, Nvivo, R, SPSS, Dragon • Find solutions to overcome administration blocks by PHSA, other than buying a UBC computer • iPads for electronic consent and recruitment.

Stakeholder Feedback:	Heather Pedersen, Laurie Smith
Project Name	Cervix Check
Brief Project Description	Women can order a cervical cancer screening kit that is delivered to their homes. Once they have mailed the kit back for testing, their Screening results are available online.
What kind of intervention is it?	Web application
What stakeholder groups does this intervention target?	1. Patients 2. Health care providers
What service providers are you working with?	• Web developers PHSA IMITs • PHSA Tech Services • PHSA SPASS, • PHSA Web Solutions • PHSA Communications • BC Cancer • UBC ethics • Family practice clinics in Surrey • BCCDC Privacy & Security
What stage is the project at?	Piloting
What is the funding status of this project?	**Awarded funding**
How is the project being funded?	1. Grants/Awards 2. BCWH Foundation / Donor Funds
How long is the funding term?	Until 2021 (2 years)
What barriers have been encountered in this project?	1. Costs. Development costs far exceeded the estimates/quotes we were provided 2. Navigating the different layers of PHSA IT service departments. There were many intake forms to fill out, and then things would sit in a very 3. long queue for approval (several months) with no information on where things stand or who to contact 4. Sustainability. Launching a pilot is one thing, but there are many questions about whether this project will be adopted and maintained through the Health Authority, and if not, what next?
What things have facilitated with this project?	1. Leaning on the expertise & guidance of the success of the BCCDC who had launched a similar program previously. 2. Decision-maker support/buy-in 3. Community-level champions/support

Stakeholder Feedback	Anna Lehman
Project Name	Implementation of a clinical diagnostic genome sequencing at BCCWH
Brief Project Description	We will pilot clinical whole genome sequencing in the Division of Genome Diagnostics at BCCWH. We will use digital health technologies for obtaining patient consent; capturing, cataloguing, transmitting phenotypic information, and providing data access for research use within a protected sphere of privacy and consent.
What kind of intervention is it?	Web application
What stakeholder groups does this intervention target?	Patients Health care providers Health System Data Services
What service providers are you working with?	• PHSA IMITS • EMR administrators (clinical informatics) • Clinical labs nationwide
What stage is the project at?	Planning
What is the funding status of this project?	Applied for funding.
How is the project being funded?	
How long is the funding term?	
What barriers have been encountered in this project thus far?	• Cost • Lack of policy • Logistical hurdles
What things have facilitated with this project thus far?	

Stakeholder Feedback:	Ariadna Fernandez, Moe Elgendi, Ken Lim
Project Name	Pulse Oximetry study
Brief Project Description	The Pulse-Oximetry Project is a non-invasive study to determine the optimal finger to use for oxygen measurement. Pilot test of a wearable device can be used to better assess possible problems in pregnancy e.g. development of preeclampsia
What kind of intervention is it?	Device (sensor/wearable) for data capture
What stakeholder groups does this intervention target?	Patients Health care providers
What service providers are you working with?	• MFM/OBGYN teams • UBC ethics • Manufacturer of sensor device
What stage is the project at?	Piloting
What is the funding status of this project?	**Awarded funding.**
How is the project being funded?	Grants/Awards from BCCHRI Faculty funds for salaries, medicine & engineering
How long is the funding term?	2 years
What barriers have been encountered in this project thus far?	• Recruitment with vulnerable population who are sick and need to be first approached by exceedingly busy physicians before they can be recruited for research has made recruitment very slow. • Buy-in from clinical team members as value and utility of project does not seem to be clear from a clinical perspective
What things have facilitated with this project thus far?	• I don't think it is a success yet - project is ongoing. We will not be able to meet recruitment targets and will have very limited power for the Canadian pilot.

Stakeholder Feedback	Sarah Munro
Project Name(s)	- Just Right contraceptive options decision aid - My Next Birth after caesarean decision aid - Birth Choices model and place of maternity care decision aid - SmartMom prenatal text messaging - Shared Decision Making online interactive training for health care professionals
Brief Project Description	These integrated projects aim to support patients, families, and their health care teams to navigate difficult choices for sexual and reproductive health. Using integrated knowledge translation and design thinking, our mixed methods multi-phase research involves developing, implementing, and evaluating these online interactive tools.
What kind of intervention is it?	Mobile application Web application
What stakeholder groups does this intervention target?	Patients Health care providers
What service providers are you working with?	• Centre for Health Evaluation and Outcomes Sciences • UBC CPD
What stage is the project at?	Piloting
What is the funding status of this project?	Awarded funding.
How is the project being funded?	- Grants/Awards – VCHRI (18 months, 2017-19), - Health Authority operational funds from PHSA and Fraser Health (2016-present) - We have been identified for further Ministry of Health funds through the government's Research Strategy. - We have grants under review for an additional 5 years for implementation science funding.
How long is the funding term?	2 years
What barriers have been encountered in this project thus far?	• Staff turnover (instead of temporary trainee staff I wish I had had more funding upfront to hire full-time staff people. We're in a better position now • Time to explain implementation and decision science to co-I's from other fields. (In future I may ask them to review MSFHR's slides from the ImpSci team workshop that took place fall 2018. Really great overview of impsci) • Participant recruitment - Since we engaged in usability testing with marginalized populations, we had to commit a lot of time to relationship building with community, but didn't have dedicated funding to do so. I had to do this off the side of my desk. I've learned my lesson and written larger budgets for these activities.
What things have facilitated with this project thus far?	• Co-I's and patient partners who share common values for client-centred care • In-house software specialists at Centre for Health Evaluation and Outcomes Sciences • Funding from health authorities and government, including in-kind support/buy-out time for staff

Stakeholder Feedback:	Heather Noga
Project Name	Development of an online resource for sexual pain and endometriosis
Brief Project Description	The project is developing a website for women with diagnosed or suspected endometriosis that are experiencing sexual pain.
What kind of intervention is it?	Web application, online information resource
What stakeholder groups does this intervention target?	Patients
What service providers are you working with?	• Tactica Interactive • Endometrosis.org
What stage is the project at?	Development Underway
What is the funding status of this project?	Awarded funding.
How is the project being funded?	Grants/Awards - CIHR
How long is the funding term?	4 years CIHR project grant (start 2018) KT activities allotment
What barriers have been encountered in this project thus far?	• Lack of knowledge of UXUI development methodology • Engaging with developers without prior team expertise in UXUI development • Writing content • Sustainability funding
What things have facilitated with this project thus far?	• Clarity of vision • Skilled developers • Realistic expectations

Stakeholder Feedback:	Nancy Lipsky
Project Name	Development of the Reproductive Infection Disease Program website
Brief Project Description	We are creating a website to serve as an online platform for publicizing our research program and study findings on the HPV vaccine in women living with HIV. We are considering working towards being a hub for clinical guidance for infectious diseases.
What kind of intervention is it?	Web application, online information resource
What stakeholder groups does this intervention target?	Patients Health Care Providers
What service providers are you working with?	• UBC IT • UBC CMS Team • WHRI staff and investigators for content creation
What stage is the project at?	Development Underway
What is the funding status of this project?	Not funded
How is the project being funded?	
How long is the funding term?	
What barriers have been encountered in this project thus far?	• It was difficult to determine the best platform to use for our website and confirm what things we should be considering when creating a website. • We did not have a team member with expertise in this space.
What things have facilitated with this project thus far?	• UBC resources • Committed Team

Stakeholder Feedback:	Beth Payne
Project Name	PIERS on the move
Brief Project Description	Decision support app for preeclampsia management
What kind of intervention is it?	Mobile application
What stakeholder groups does this intervention target?	Health Care Providers
What service providers are you working with?	• Graphic Designer, Natsuko Hayashida • Software Developer, Dustin Dunsmuir BCCHRI • Academic consultation partners
What stage is the project at?	Implementation Ongoing
What is the funding status of this project?	**Awarded Funding**
How is the project being funded?	• Grants/Awards (gates foundation) • Foundation/Donor funds
How long is the funding term?	10 years
What barriers have been encountered in this project thus far?	• Learning to navigate tech language and work effectively with industry partner • Defining a business plan for scale up that reflected project goals (e.g. access for free and large scale uptake for LMIC) but also a plan that was feasible. • Ethical commercialisation
What things have facilitated with this project thus far?	• Large motivated team • Well-funded • Great academic partner with connection to local MoH for implementation support.

BC WOMEN'S DIGITAL HEALTH SURVEY

Digital Health is an umbrella term used to describe the application of information and communication technologies (ICTs) to areas of health, health care and wellbeing. The term encompasses eHealth, mHealth, virtual health as well as emerging areas, such as the use of advanced computing sciences in 'big data', genomics, virtual reality and artificial intelligence.

This survey has two aims:

1. To take stock of all women and neonatal focused digital health interventions, service   delivery and research happening at BC Women's, the Women's Health Research Institute   (WHRI) and affiliated sites.
2. To find out what you feel the current gaps in digital health are at BC Women's and the WHRI, and what you feel should be prioritised in planning for a women's health-focused digital health resource hub.

Section I : Digital Health Scan

1. Which of the following best describes your role at BC Women's/WHRI
 Investigator (PI)
Affiliate Investigator (Co-I)
Administrative Staff
Clinical Staff
Management/Professional Staff
Research Staff
Clinical fellow/Trainee (Post-MD)
Graduate Student (Masters or Doctoral)
Postdoctoral Fellow
Student (includes undergraduate & medical students)
Other
_____

2. I have recently been involved in, am currently involved in, or plan to be involved in a digital health project at, or affiliated with BC Women's?
Yes
No

3. What is the name of the digital health project?

BC WOMEN'S DIGITAL HEALTH SURVEY

Section I : Digital Health Scan

4. What stakeholder groups does the intervention target?

 -Patient population
- Health care providers
- Health System
- Data services

5. What type of technology does it employ?

- Devices (senors/wearables)
- Mobile application
- Web applications
- Virtual/Augmented Reality
- AI
- Other

6. In 1 or 2 sentences please provide a brief description of the digital health project:

7. If known, please name the service providers you have worked with on this project: (e.g. web developers, graphic designers, UBC/PHSA IT, academic collaborators, others):

8. Please indicate what phase this project is in?
- Planning
- Development underway
- Feasibility/usability testing
- Piloting
- Completed
- Planning or implementation
- Implementation ongoing
- Scale up

9. Please indicate whether you have already secured funds for this project ?
- Awarded funding
- Applied for funding
- Not funded

10. How is this project being funding? Tick all that apply.
- Grants/Awards
- Programmatic Operations from Health Authority
- Hospital operations
- Industry funds
- Physician engagement funds
- Foundation/Donor funds
- Corporate and Venture Investors
- Digital Super Cluster
- Other

11. How long is this funding term ? If known please indicate start and end date of funding term.

12. What were the top 3 challenges that you faced while working on this digital health project so far?

13. What were the top 3 enablers that contributed to the success of this digital health project so far?

BC WOMEN'S DIGITAL HEALTH SURVEY

Section II: Identifying Gaps in Digital Health

14. Technology can assist and the way you deliver care and do your work. What technology developments would you like to see at BCWH/WHRI?

15. The following is a list of tools involved in doign digital health work. How do you feel BCWH/WHRI are doing at each?

- Ease of access to digital health experts and innovators

- Ease of access to province-wide population data and large cohort

- Ease of access to electronic medical records

- Information and data sharing between departments at C+W campus

- Technology equipment sharing between departments at C+W Campus

- Ease of accessing and navigating clinical programs, IT, privacy and security,

- Funding for digital health

- Other

16. Please rank which areas you feel would be most valuable for BC Women's and WHRI to focus on in planning for a digital health strategy

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Remote monitoring									
Online treatment									
Self-management									
Patient -Provider messaging									
Digital education and training opportunities									
Web and mobile application expertise									
Data warehousing (storage of big data)									
Virtual and augment reality									
Artificial intelligence (building machines capable of thinking acting and learning like humans)									

17. Is there anything you would like to add in helping us to plan for a women and neonatoal focused digital health strategy?