

Conducting Digital Health Research

Let's start with defining some concepts. First, what is digital health?

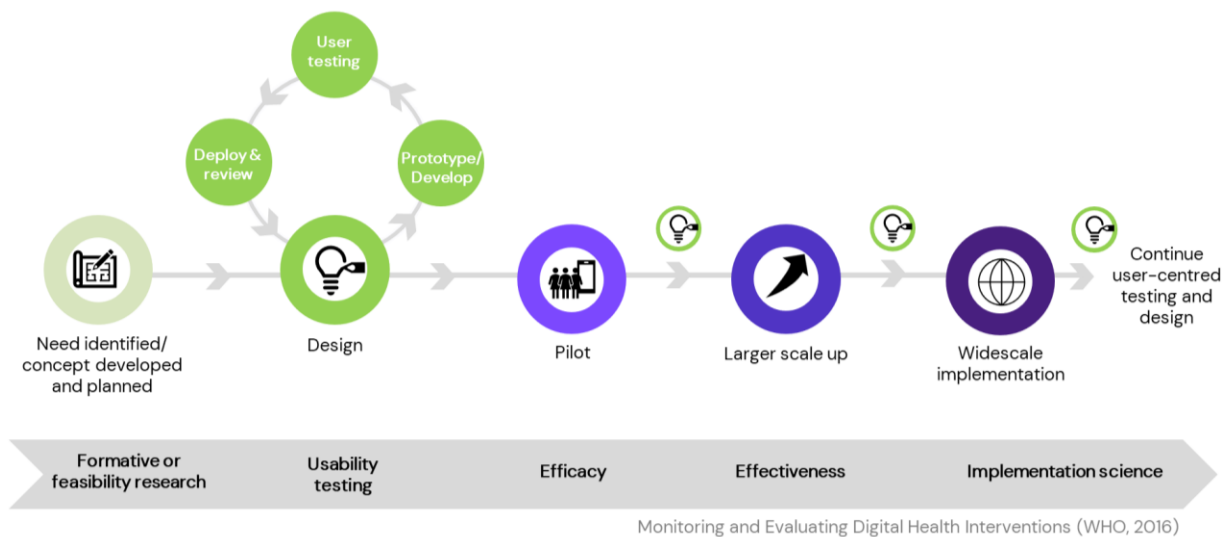
“Digital Health” is an umbrella term used to describe the application of digital technologies in areas of health, health care and wellbeing. Some common examples of digital health technologies include websites, mobile apps, wearables or sensors, telemedicine, or other technologies which can be used in interventions for clients or patients, healthcare providers, health system management, and/or health data services (WHO, 2018).

This page contains a brief overview of:

1. Typical digital health research methods and intervention stages
2. Designing products that work: human-centred design
3. Working with vendors
4. Digital health research privacy and security

First Thing's First: Identify Appropriate Research Methods Based on Your Research Objectives and Digital Intervention's Maturity Stage

When leveraging a digital tool in a health intervention, there are multiple opportunities to evaluate whether the technology is being used as intended and whether the use of that technology can achieve desired outcomes for a specific population. Some typical stages are outlined in diagram below, which displays different research methods appropriate for varying stages in a digital intervention's maturity and scope, as well as the technology's readiness level (sources below). Connect with WHRI for support on digital health research methodology and best practices ([learn more](#)).



Learn more:

- World Health Organization. (2016). Monitoring and evaluating digital health interventions: a practical guide to conducting research and assessment.
- Determine your innovation's Technology Readiness Level (TRL) and conduct research based on maturity stage: <https://www.ic.gc.ca/eic/site/101.nsf/eng/00077.html>

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Developing Products that Work: Human-Centred / Patient-Centred Design

When designing a technology and digital health intervention, it is important to centre development around patient and system user needs. “Users” of a digital health technology are all the groups of individuals who directly interact with the system, either to deliver health services (e.g., health care providers, administration staff, etc.) or to receive services (e.g., patients or clients).

Human-centred or patient-centred design considers not only how target users will interact with the technology for an optimal experience, but also seeks to empathize and centre development and solutions around target users’ mental, physical, and emotional needs. The process begins with **inspiration**, where a need is identified, and researchers seek to understand existing problems faced by patients and other potential users. Then, innovators will engage in **ideation** to design potential solutions, they will **prototype** their ideas and then **test with target users** (see diagram above).

User experience plays an important role in human-centred design, and usability, visual appeal, and how a user feels while interacting with the system should be carefully assessed. Considering digital tools used specifically in health interventions, user needs can be influenced by social, geographic, economic, and personal factors. In desiring to place human experience at the centre of design and user testing, it is encouraged to consider a diversity of potential users from within your target population (i.e., diversity in gender, ethnicity, digital literacy, etc.), who may experience interactions with the technology and health system differently - at every stage of development - to promote equitable design.

Finally, designing digital technologies to achieve public health goals is an iterative process. Needs and gaps can continue to be identified along the process, providing innovators opportunities to re-enter design cycles and develop a product that can address the problems the system was ultimately designed to solve.



Learn more:

- ISO, B., & STANDARD, B. (2018). Ergonomics of human-system interaction. Available at <https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-2:v1:en>
- Roberts, J. P., Fisher, T. R., Trowbridge, M. J., & Bent, C. (2016). A design thinking framework for healthcare management and innovation. In *Healthcare* (Vol. 4, No. 1, pp. 11-14). Elsevier.
- Adam, M. B., Minyenya-Njuguna, J., Karuri Kamiru, W., Mbugua, S., Makobu, N. W., & Donelson, A. J. (2020). Implementation research and human-centred design: how theory driven human-centred design can sustain trust in complex health systems, support measurement and drive sustained community health volunteer engagement. *Health Policy and Planning*, 35(Supplement_2), ii150-ii162.
- Figueroa, C. A., Luo, T., Aguilera, A., & Lyles, C. R. (2021). The need for feminist intersectionality in digital health. *The Lancet Digital Health*, 3(8), e526-e533.
- Kim SH, Myers CG, & Allen L. (2017). Health care providers can use design thinking to improve patient experiences. <https://hbr.org/2017/08/health-care-providers-can-use-design-thinking-to-improve-patient-experiences>

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Working with Vendors and Considering Intellectual Property

If you are not developing innovations in-house, you will likely have to work with a vendor to bring the innovation to life. Vendor selection will depend on multiple factors, such as your project goals, budget, and intentions of implementing in the health care system.



- PHSA has a list of preferred vendors, which employees can access [here](#) (PHSA vendors). If you have identified a vendor that best meets your project's goals, but they are not on the existing PHSA list, you can contact consulting@phsa.ca to learn about the process of hiring consultants outside of the pre-qualified list.
- If you need further support with finding vendors and managing vendor relationships, the WHRI can help researchers identify recommended vendors based on project needs and intent ([learn more](#)).

Depending on the scope of the project and intentions or openness for a future scale-up, it would be beneficial to think about potential commercialization pathways and intellectual property (IP) protection early in the research. Below are resources you can view if you have questions about IP.



- [The Technology Development Office \(TDO\)](#) provides strategic advice to [PHSA-affiliated researchers](#) or industry and academic partners working with PHSA researchers who have questions about intellectual property and the processes for technology commercialization.
- [The UBC University Industry Liaison Office \(UILO\)](#) supports UBC-affiliated researchers conducting activities at PHSA program sites (except BC Cancer). Their services include IP, commercialization, and contract management.

Conducting Digital Health Research: Privacy & Security

When engaging in your digital health research project, ensure that you are compliant with applicable privacy and security requirements. To learn more about privacy and security, research ethics processes, and conducting research virtually, see the resources below.



- [PHSA Research Privacy](#)
- Conducting Research at C&W: [UBC C&W REB](#)
- [COVID-19 Virtual Health Toolkit](#)
- Conducting [online surveys and obtaining electronic consent](#) from research participants.

This resource page was developed by Candice Taguibao, WHRI's digital health research manager. If you have any questions about the information above, contact candice.taguibao@cw.bc.ca and learn how the WHRI can support your digital health projects by clicking [here](#).

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