

Considerations of Ethics and Equity in deploying AI in healthcare

Jay Shaw, PT, PhD, AMS Phoenix Fellow

Scientist, Institute for Health System Solutions and Virtual Care,
Women's College Hospital

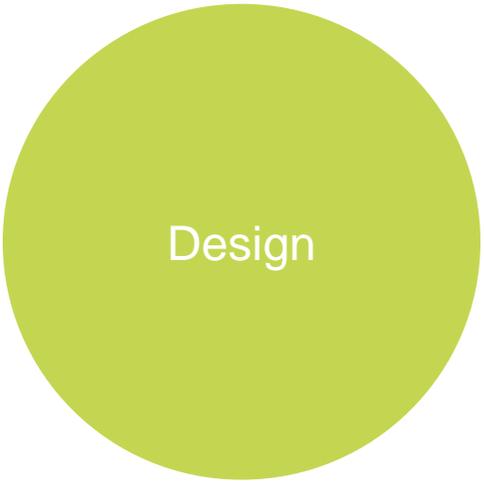
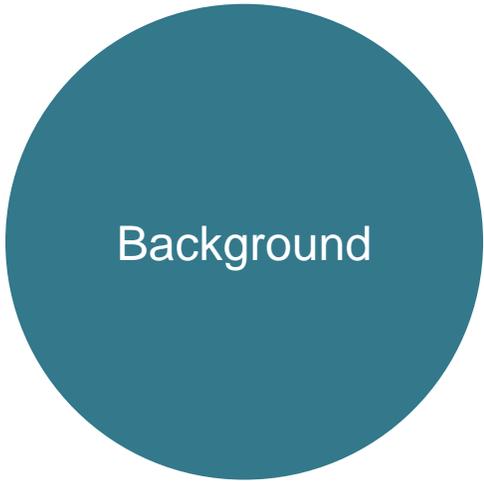
Research Director, Artificial Intelligence, Ethics & Health, University
of Toronto Joint Centre for Bioethics



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Outline



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Background



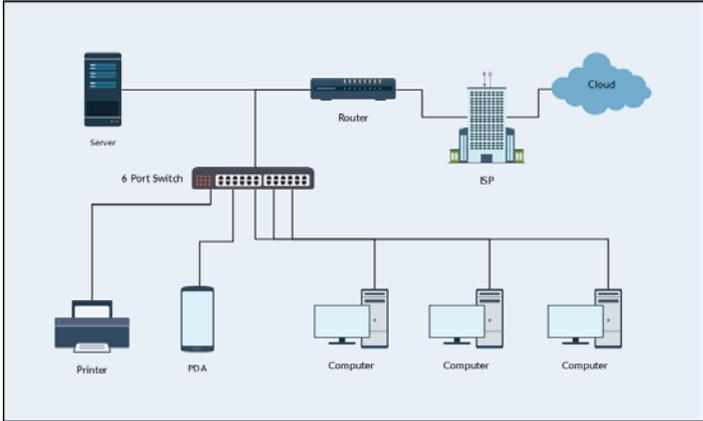
World stumbling zombie-like into a digital welfare dystopia, warns UN human rights expert

NEW YORK (17 October 2019) – A UN human rights expert has expressed concerns about the emergence of the "digital welfare state", saying that all too often the real motives behind such programs are to slash welfare spending, set up intrusive government surveillance systems and generate profits for private corporate interests.



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Background



Ontario

Ministry of Health Ministry of Long-Term Care

Ontario Health Teams

Patients receive all their care, including primary care, hospital services, mental health & addictions services, long-term care, and home and community care from **one team**.



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Level-Setting: AI + Digital Health



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Level-Setting: AI



JOURNAL OF MEDICAL INTERNET RESEARCH

Shaw et al

[Viewpoint](#)

Artificial Intelligence and the Implementation Challenge

James Shaw^{1,2}, PhD; Frank Rudzicz³, PhD; Trevor Jamieson^{1,4}, MD, MBI; Avi Goldfarb⁵, PhD

JOURNAL OF MEDICAL INTERNET RESEARCH

Shaw et al

Table 1. Examples of use cases in each category of application.

Type of use case	Clinical ^a	Operational ^b	Epidemiological ^c
Decision support	Producing a more accurate prediction of the likely outcome of a particular intervention [20]	Identifying potential staff scheduling changes related to forecasted emergency room volumes [21]	Warning systems for disease outbreak [22]
Automation	Automatically altering insulin treatment in response to monitored glucose-insulin dynamics [23]	Use of robotics for operational tasks in dementia care, such as meal delivery [24]	N/A ^d

^aTasks related to the assessment, intervention, and evaluation of health-related issues and procedures, generally performed by qualified health care providers.

^bTasks related to activities that are ancillary to clinical tasks but necessary or valuable in the delivery of services.

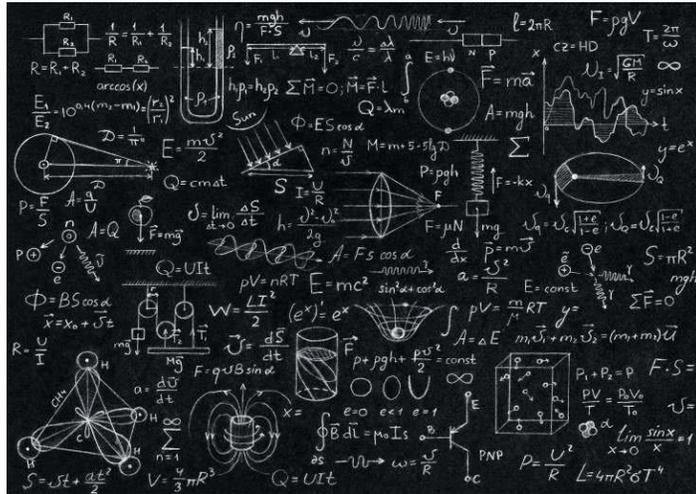
^cTasks related to more accurately identifying the health needs and outcomes of people within a given population.

^dNot applicable.

Level-Setting: AI



Decision-support (Prediction)



Automation



Level-Setting: Digital Health



Level-Setting: Digital Health



How is digital technology used for health care?

1. To **find information** about health and health services
2. To **communicate** with health care providers
3. To **exchange and analyze data** for better care



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Level-Setting: Digital Health



Swiss Medical Weekly

Formerly: Schweizerische Medizinische Wochenschrift
An open access, online journal • www.smw.ch

Review article: Biomedical intelligence | Published 16 January 2018 | doi:10.4414/smw.2018.14571
Cite this as: Swiss Med Wkly. 2018;148:w14571

Digital health: meeting the ethical and policy challenges

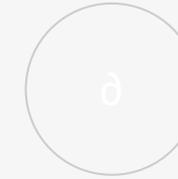
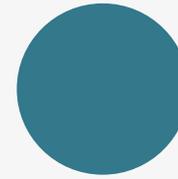
Vayena Effy^a, Haeusermann Tobias^b, Adjekum Afua^a, Blasimme Alessandro^a

“The defining feature of digital health, however, has to do with **data** *rather than* **technology.**”



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Level-Setting: Digital Health



Atul Gawande  @Atul_Gawande · 5h

My latest @NewYorker piece, in gestation for a couple years now, as you'll see. Something to read about other than the election, at least. It is on the state of health care information technology. In other words: [newyorker.com/magazine/2018/...](https://www.nytimes.com/2018/05/14/magazine/why-doctors-hate-their-computers.html)



Why Doctors Hate Their Computers

Digitization promises to make medical care easier and more efficient. But are screens coming between doctors and patients?

[newyorker.com](https://www.nytimes.com/2018/05/14/magazine/why-doctors-hate-their-computers.html)



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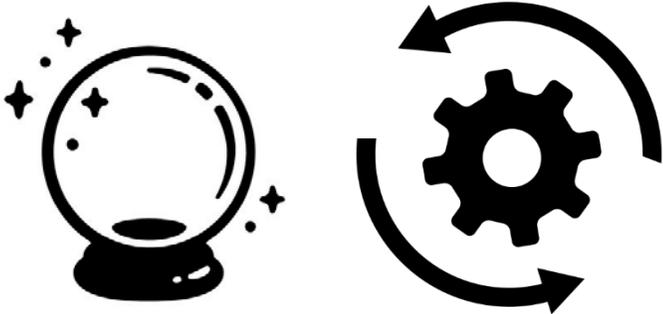
Level-Setting: AI + Digital Health



Digital Health



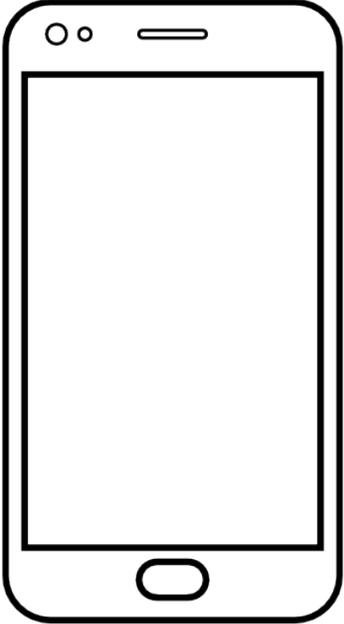
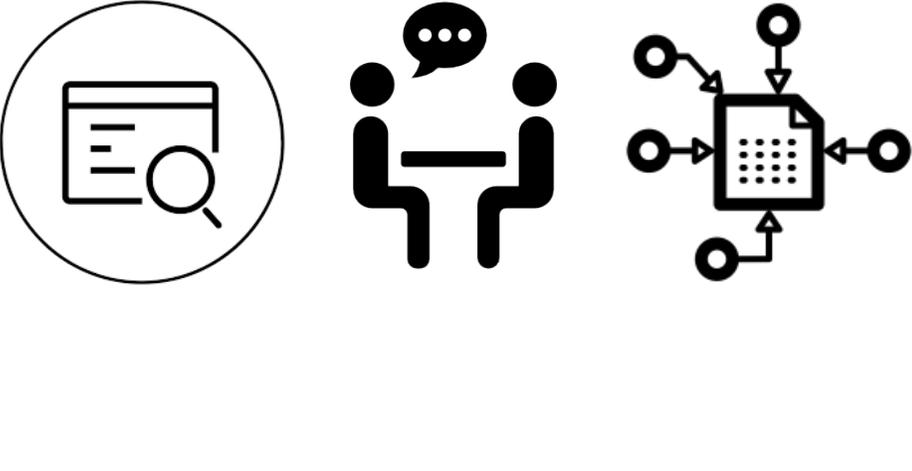
Artificial Intelligence



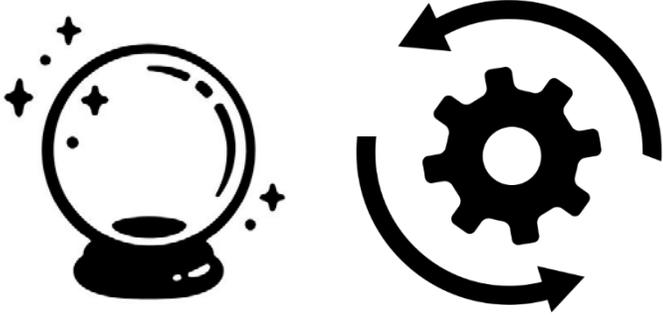
Level-Setting: AI + Digital Health



Digital Health



Artificial Intelligence



What are the issues?



Ethics

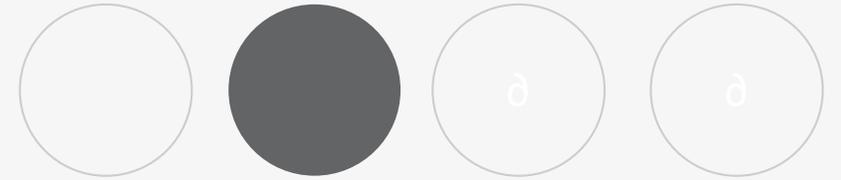


Equity



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What are the issues?

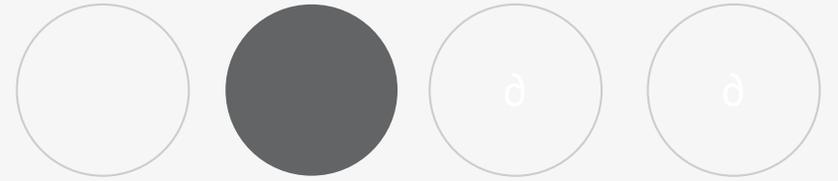


Ethics



“well-founded **standards** of **right** and **wrong** that **prescribe** what humans **ought** to do, usually in terms of *rights*, *obligations*, *benefits* to society, *fairness*, or *specific virtues*”

What are the issues?



Ethics



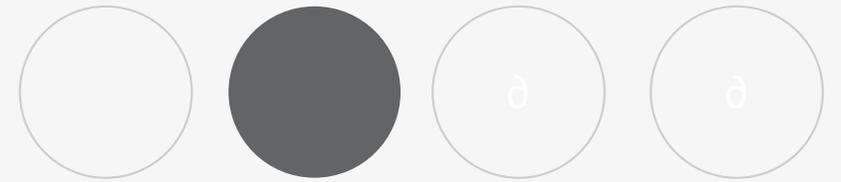
Owning Ethics: Corporate Logics, Silicon Valley, and the Institutionalization of Ethics

Jacob Metcalf (Data & Society), Emanuel Moss (Data & Society, CUNY Graduate Center), danah boyd (Microsoft Research, Data & Society)



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What are the issues?



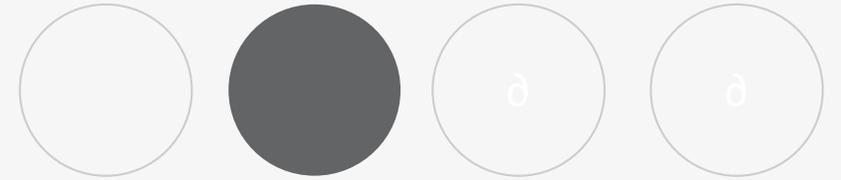
Equity

From an **ethical perspective**, equity primarily concerns the concept of **“justice”**.



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What are the issues?



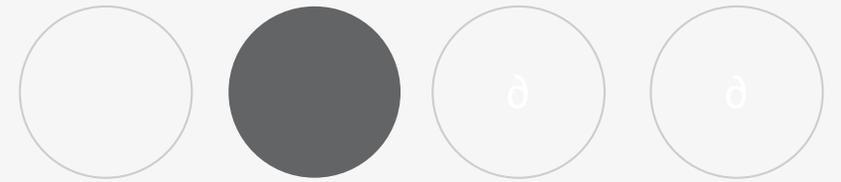
Equity

Justice:

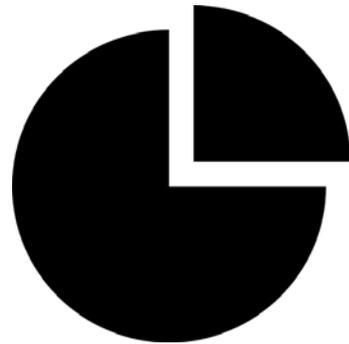
The **moral dimensions** of the distribution of *benefits + burdens, advantages + disadvantages*.



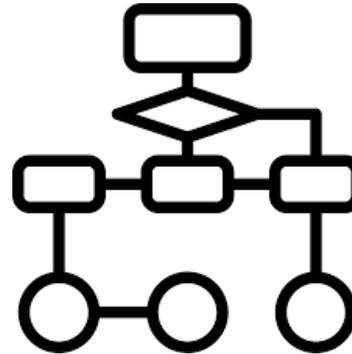
What are the issues?



Justice:



Distributive



Procedural

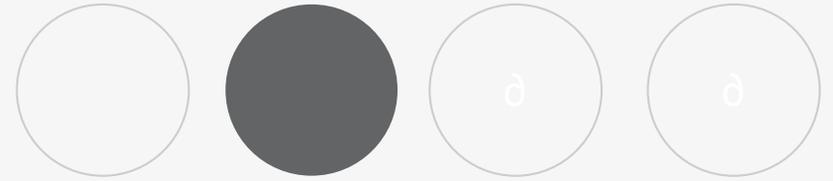


Relational

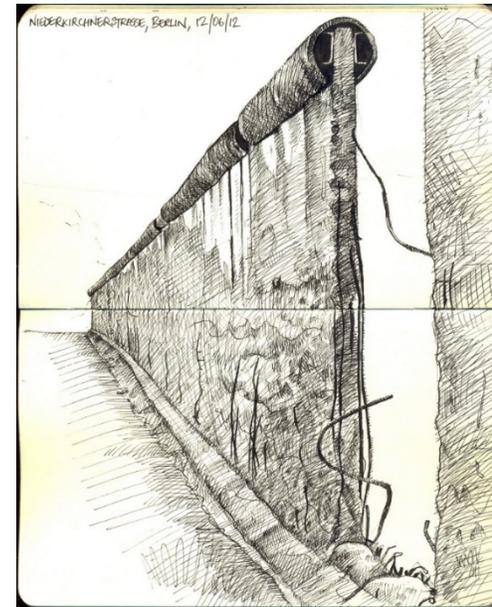
What are the issues?



What are the *equity* issues?

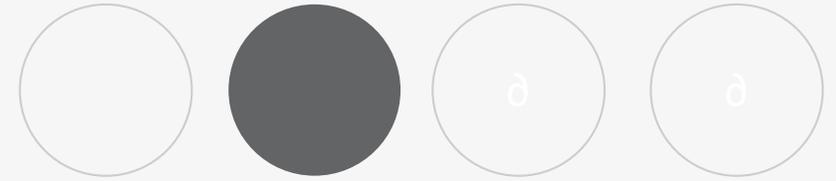


1. Technology is **becoming** more **pervasive**, but **not all communities** have **equal access** to connected digital devices.

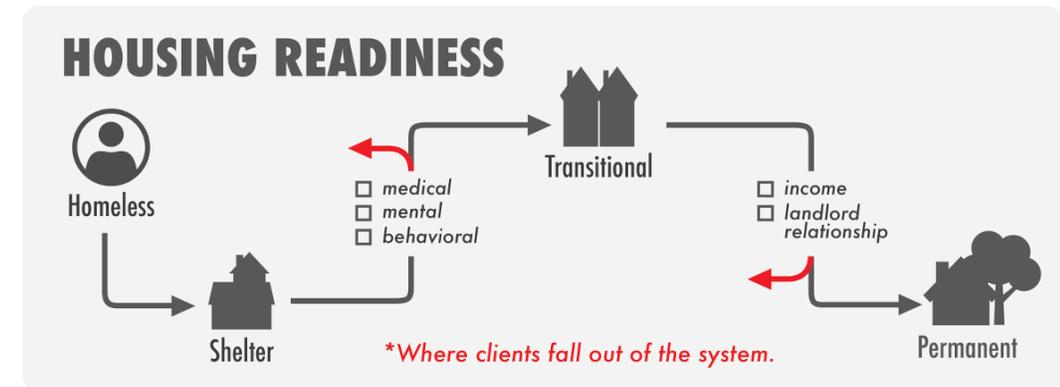


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What are the *equity* issues?

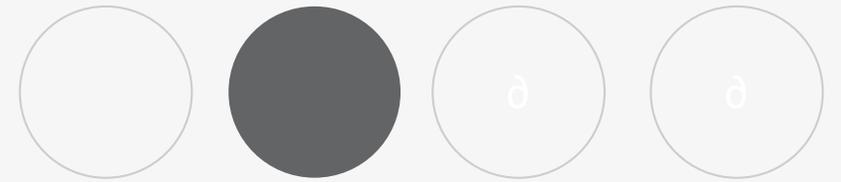


1. Technology is **becoming** more **pervasive**, but **not all communities** have **equal access** to connected digital devices.
2. **Not all problems** are best solved by technology, but **ethically designed** innovation can play an important role.



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What are the *equity* issues?



1. Technology is **becoming** more **pervasive**, but **not all communities** have **equal access** to connected digital devices.
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3. Policy and Procurement for digital health technologies should focus on **meeting the needs of providers and the public.**



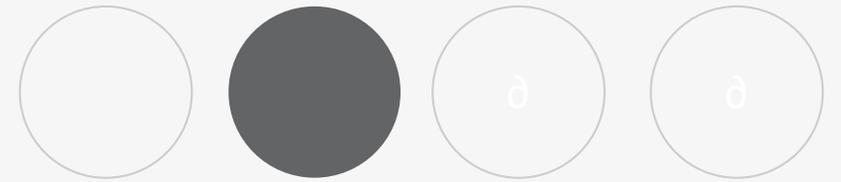
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Ontario Health Teams

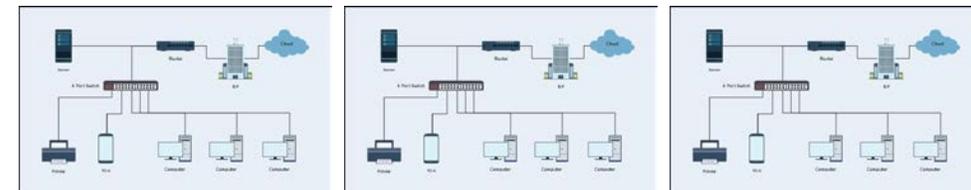


Patients receive all their care, including primary care, hospital services, mental health & addictions services, long-term care, and home and community care from **one team.**

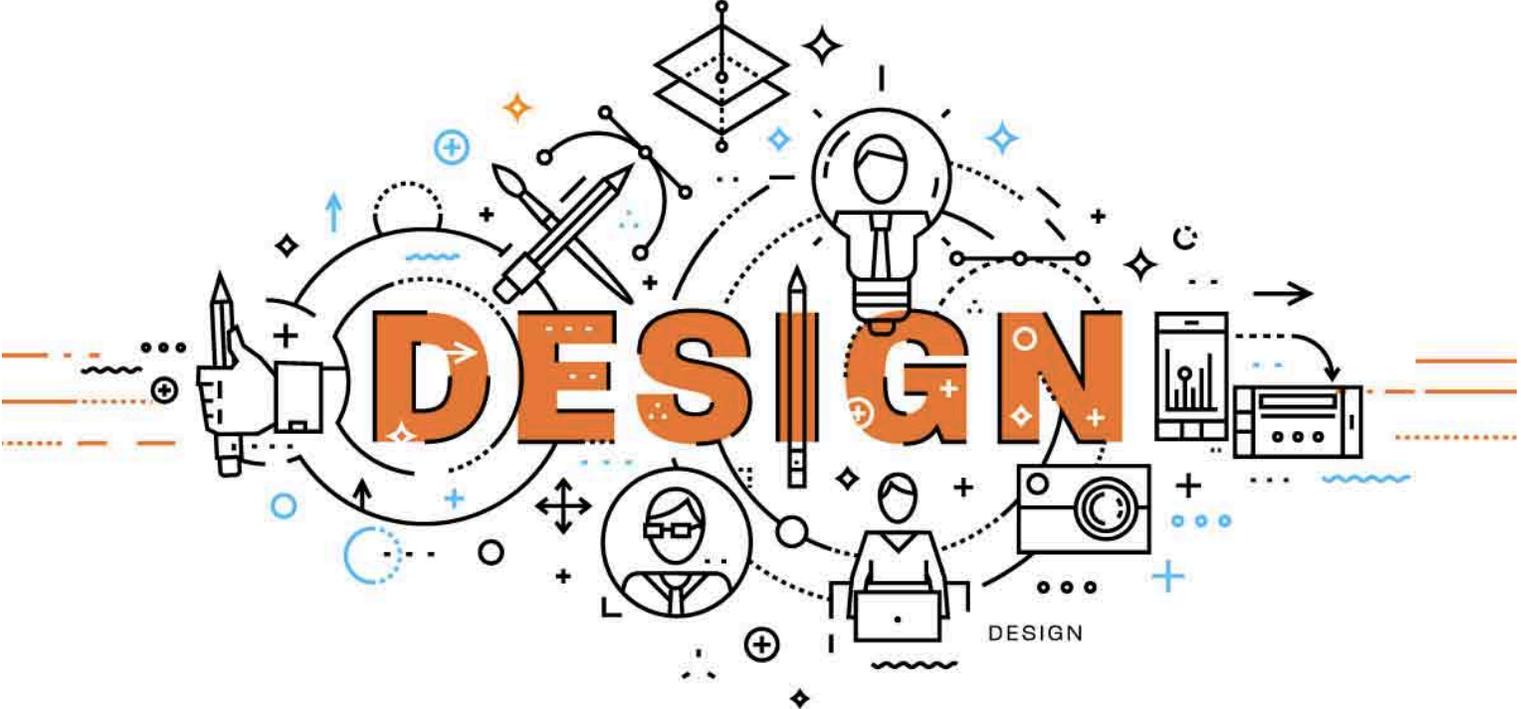
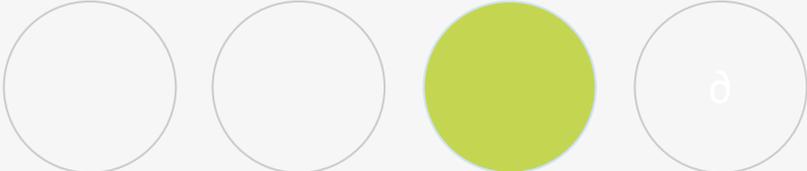
What are the *equity* issues?



1. Technology is **becoming** more **pervasive**, but **not all communities** have **equal access** to connected digital devices.
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4. **The fundamentals** of a digitized health system **need attention** before digital health can meet its potential.



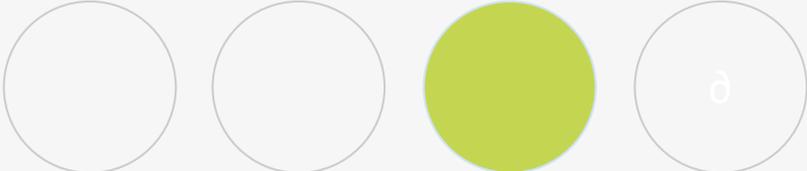
So what next?



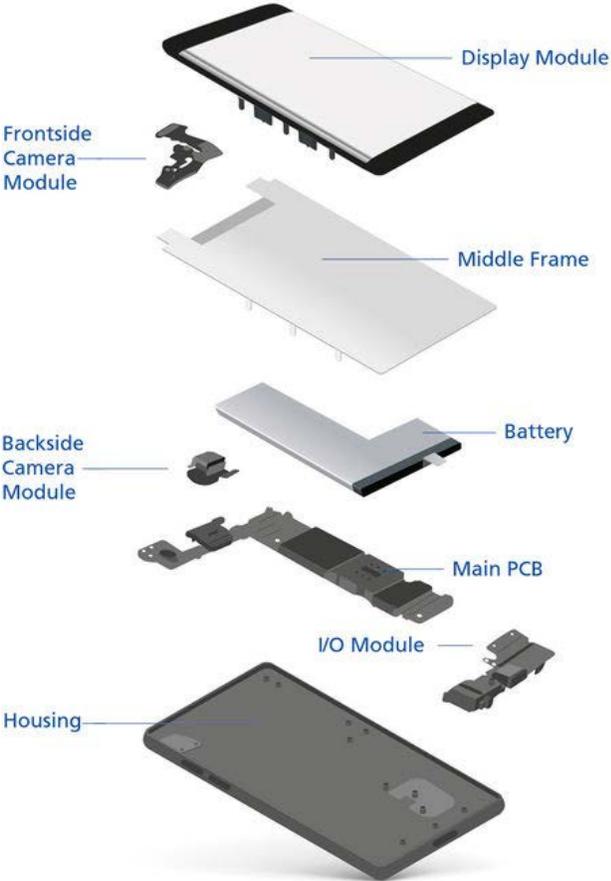
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So what next?

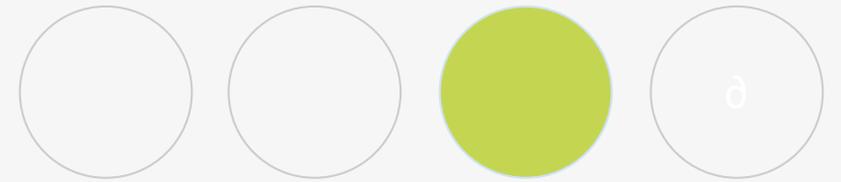


Product Design



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So what next?



PERSPECTIVE **OPEN**

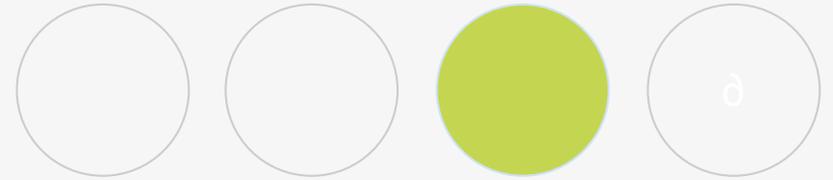
Beyond “implementation”: digital health innovation and service design

James Shaw^{1,2}, Payal Agarwal¹, Laura Desveaux^{1,2}, Daniel Comejo Palma^{1,2}, Vess Stamenova¹, Trevor Jamieson^{1,3,4}, Rebecca Yang¹, R. Sacha Bhatia^{1,2} and Onil Bhattacharyya^{1,2}

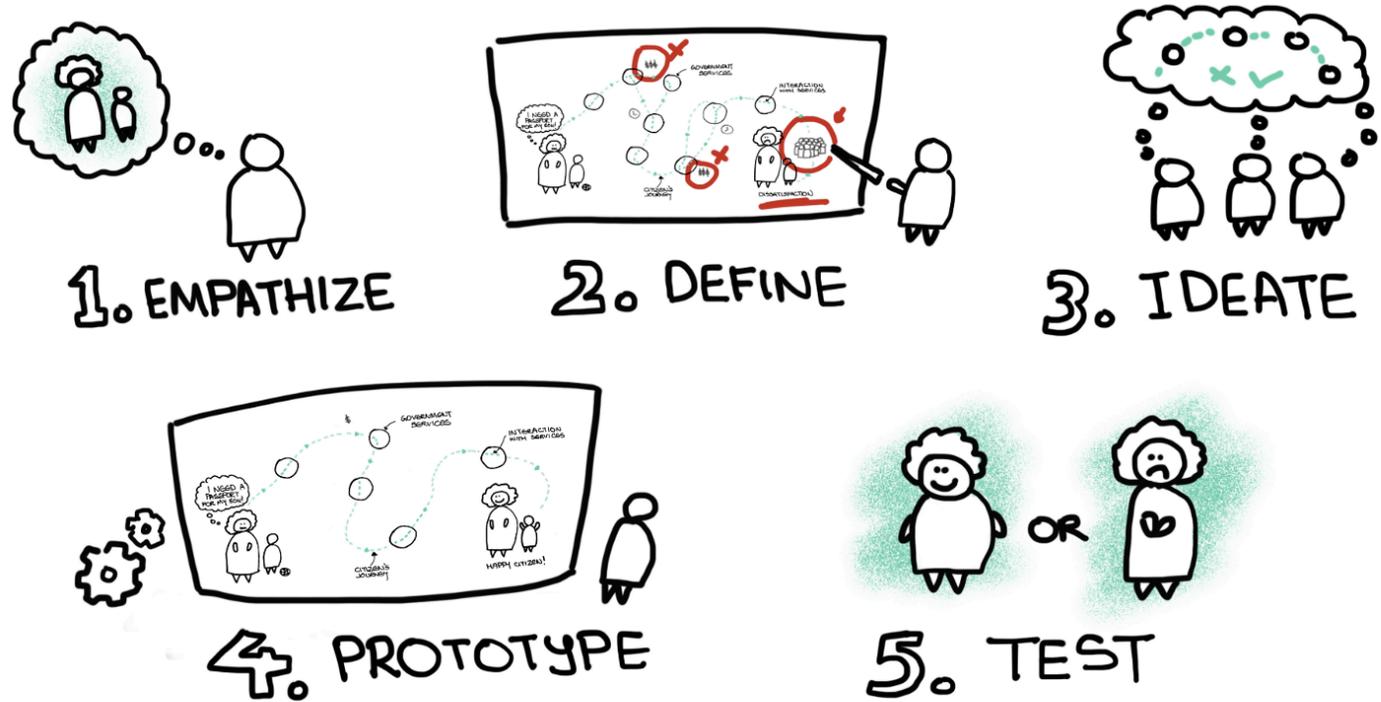


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So what next?

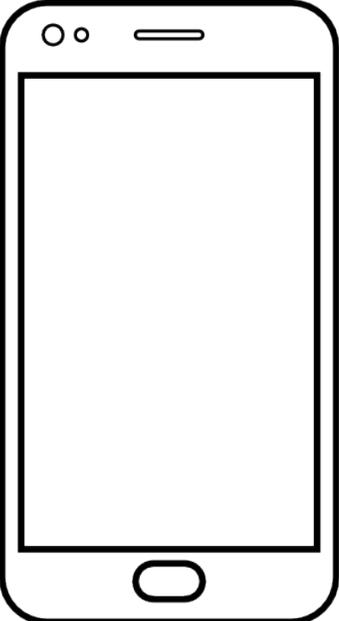
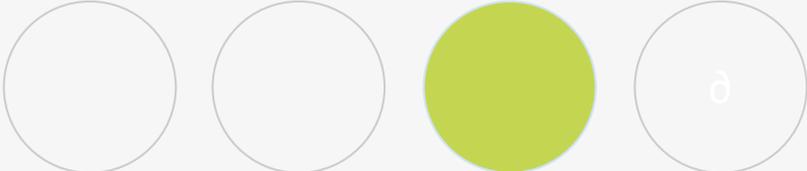


d. 
HASSO PLATTNER
Institute of Design at Stanford

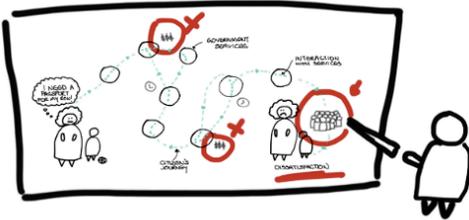


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So what next?



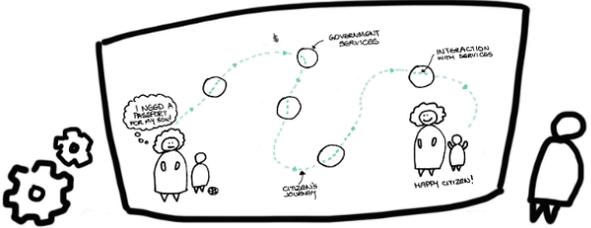
1. EMPATHIZE



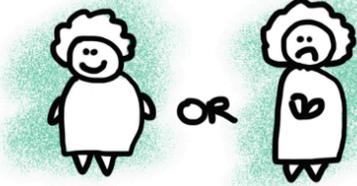
2. DEFINE



3. IDEATE



4. PROTOTYPE

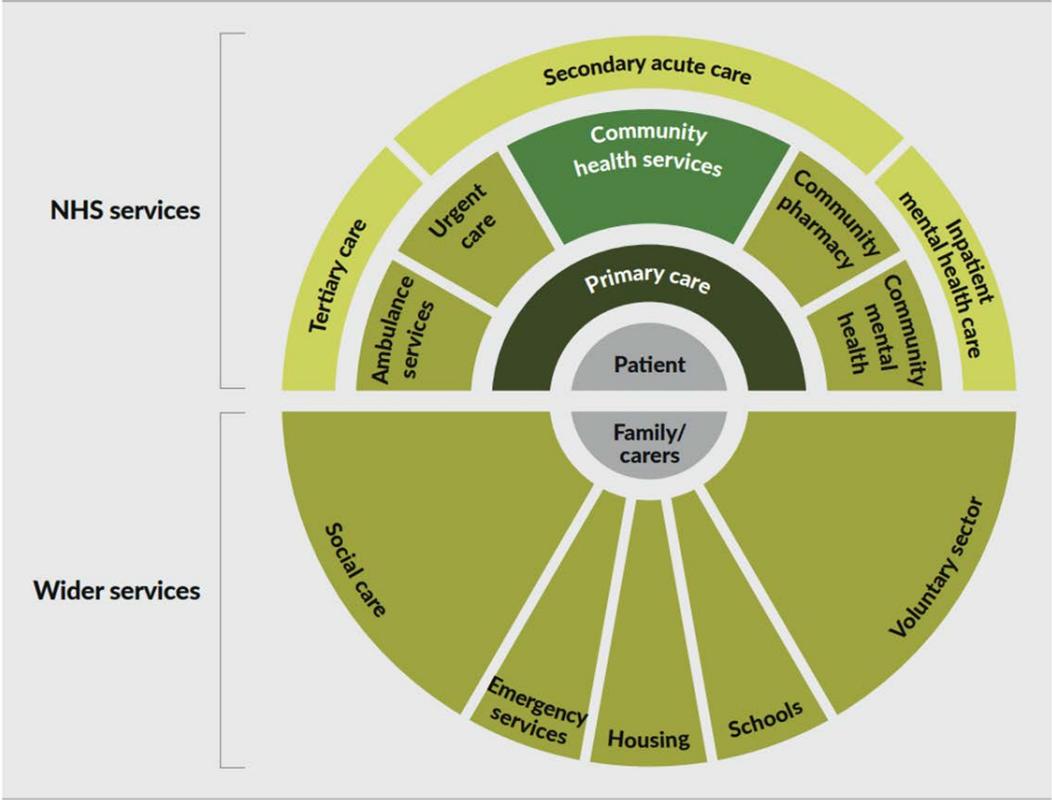
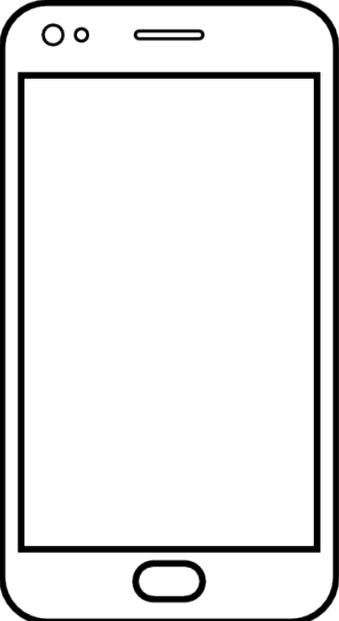
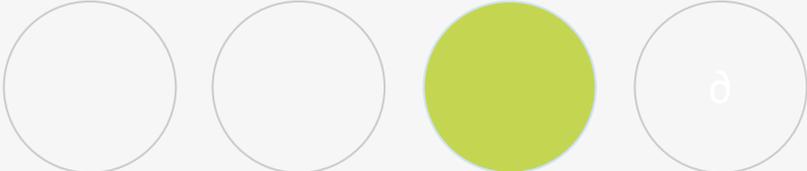


5. TEST



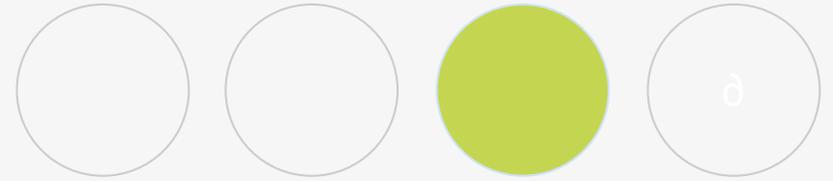
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So what next?



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So what next?



The Ethics Design Lab



Ethicist as Designer: A Pragmatic Approach to Ethics in the Lab

Aimee van Wynsberghe • Scott Robbins

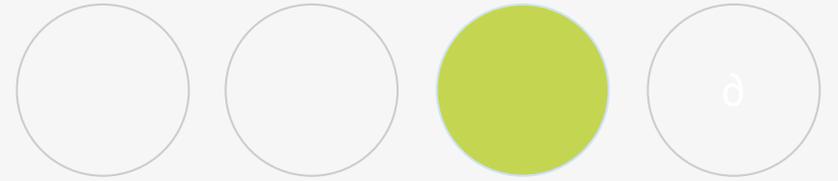
A Trojan horse approach to changing mental health care for young people through service design

Louisa Szücs Johansson^a, Josina Vink^{a,b} and Katarina Wetter-Edman ^{a,c,d}



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So what next?



1. Technology is **becoming** more **pervasive**, but **not all communities** have **equal access** to connected digital devices.

Who will actually be able to use the technology to improve their health?

Who will be left out?

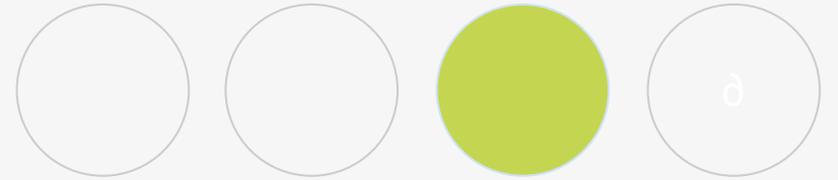
How might more equal access to the technology be achieved?

What broader structures need to change to enable that?



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So what next?



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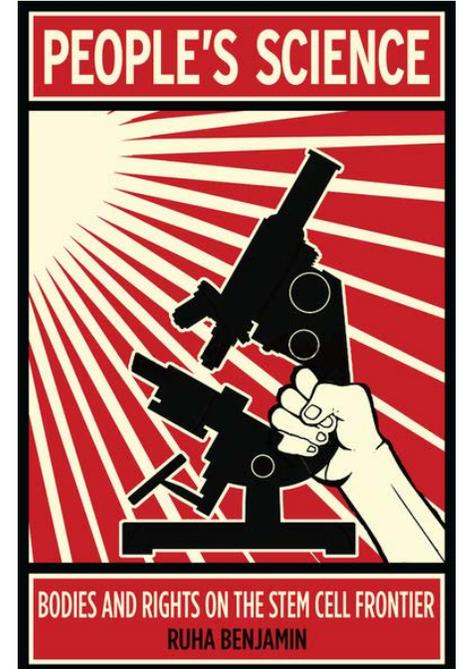


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Responsible Innovation



- *“a transparent, interactive process by which **societal actors and innovators** become mutually responsive to each other with a view to the **(ethical) acceptability, sustainability and societal desirability** of the innovation process and its marketable products (in order to allow a **proper embedding** of scientific and technological advances in our society)”*



At the Joint Centre for Bioethics



1. **Public Trust:** Does the public trust the institutions and the technology?
2. **Ethical Governance of Health Data:** What protections are in place for health data?
3. **Health Equity and AI Applications:** Is the technology being leveraged in service of an equitable system?
4. **The Future of Care:** How will the technology re-shape the practices that make up health care?

Thank you!



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