

# Harnessing Digital Health to End AIDS Epidemic

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# Digital Health



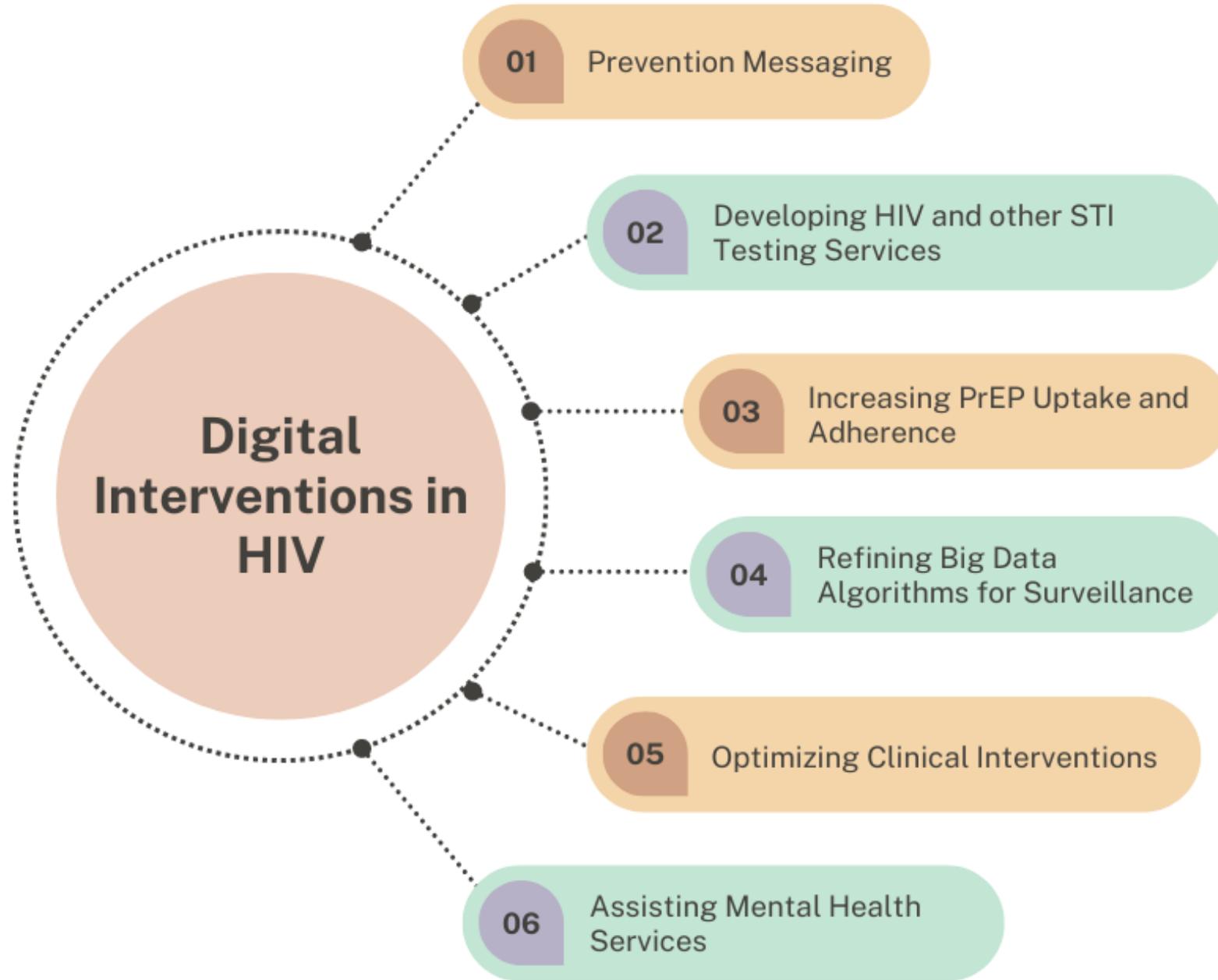
**A digital revolution:  
Web 2.0, Social  
Media, Information  
and Communications  
Technologies.<sup>1</sup>**



**Growth of digital  
technologies for  
health.<sup>2</sup>**



**Digitizing health  
research.<sup>3</sup>**



# Digital Interventions in HIV

## Prevention Messaging

1

Promoting digital, peer-led prevention messaging through social media influencers or peer networks.

2

Improving education on HIV and other sexually transmitted infections in schools and for health promotion among youth.<sup>4</sup>

3

Digital crowdsourcing to develop prevention messaging , especially among key populations.

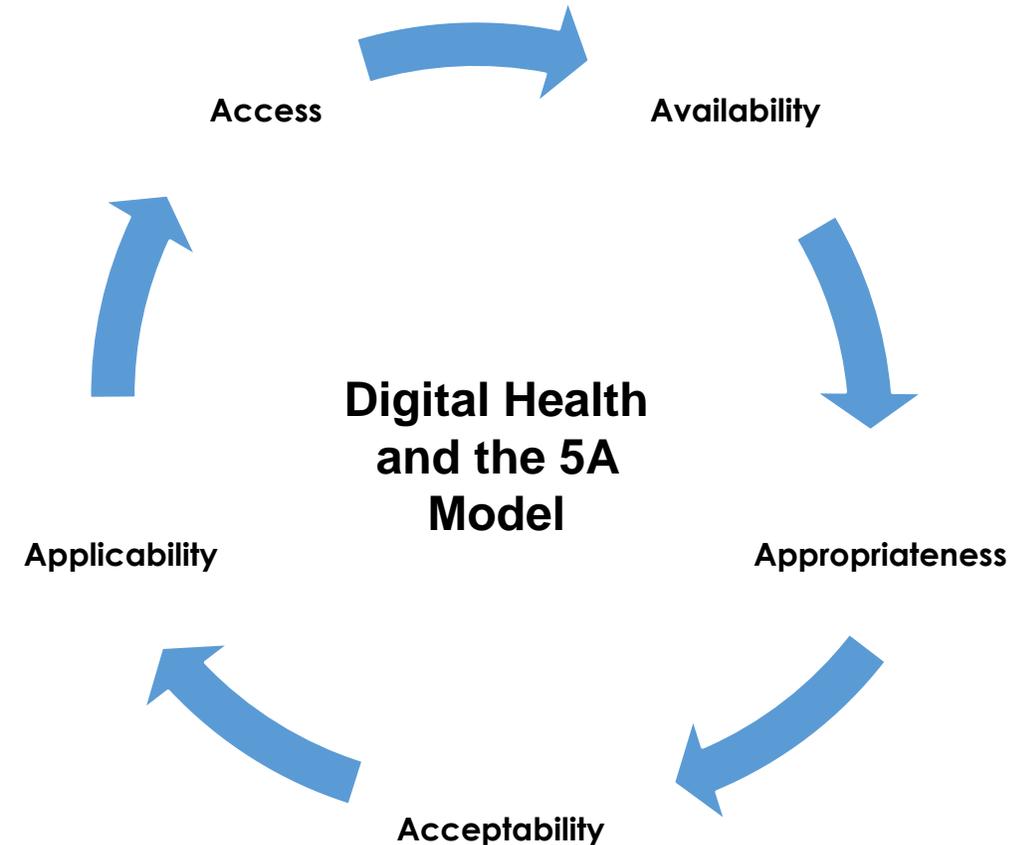
4

Behavioural theories can be incorporated into digital peer-led or crowdsourced interventions.

# Digital Interventions in HIV

## Uses of Digital Interventions in HIV&STI Testing Services

- Increase access to HIV testing, and improve all aspects of the 5A model for HIV services.
- Online HIV and other STI testing services promotion to increase awareness and uptake
- Geolocation services to push information to promote HIV and other STI services.
- Facilitate knowledge exchange and communications with key populations underserved due to stigma.



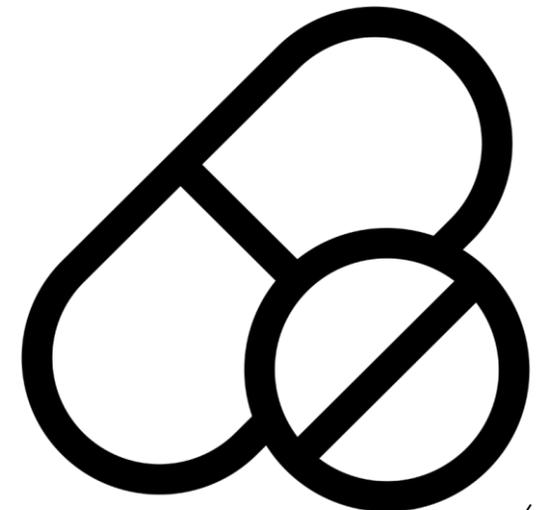
# Digital Interventions in HIV

## Increasing PrEP Uptake and Adherence

Understanding discourse and community perceptions of HIV pre-exposure prophylaxis in communities

Crowdsourcing PrEP provider locations (<https://preplocator.org/>)

Implementing interventions that promote PrEP uptake using social media and mobile applications.<sup>5</sup>



# Digital Interventions in HIV

## Refining and Using Big Data Algorithms for Surveillance

01

Digital platforms constitute part of big data in digital health.

02

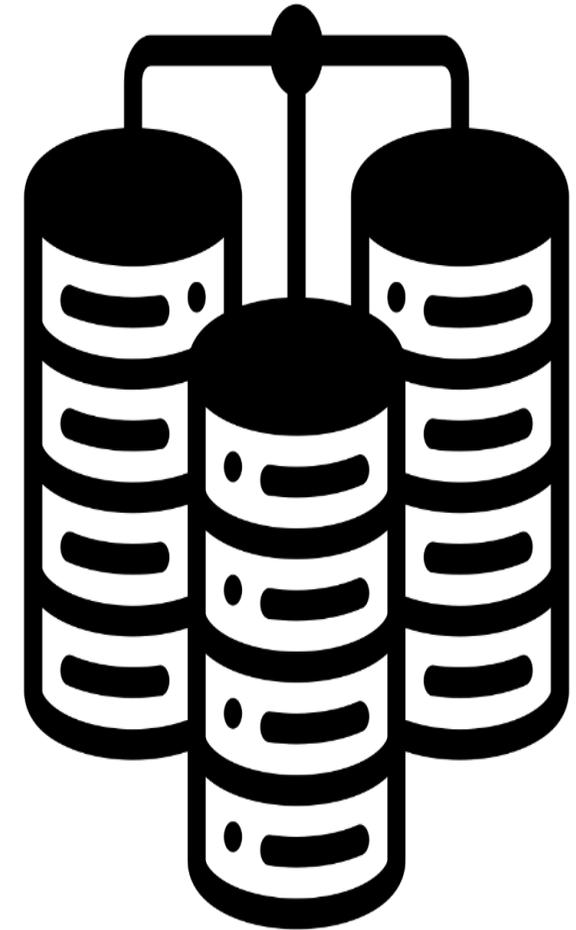
Monitoring and forecasting HIV incidence or deaths associated with AIDS.

03

Prediction health approaches in HIV using big data for prompt interventions.<sup>6,7</sup>

04

Using artificial intelligence (AI) algorithm to facilitate selection of peer change agents to optimize HIV prevention programs.



# Digital Interventions in HIV

## Optimizing Clinical Interventions



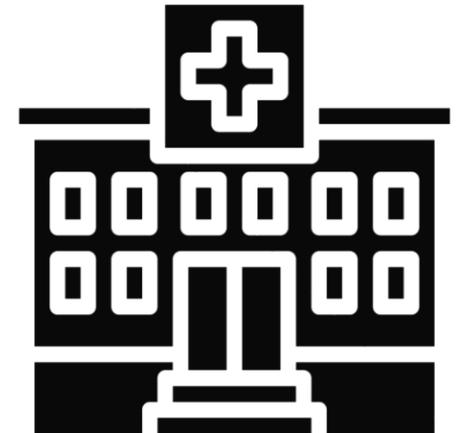
Optimizing post-testing care: Linkage-to-care, treatment adherence, and retention in care.



Mobile health (mHealth technologies and apps) to improve care.



Gamification to improve services uptake.



# Digital Interventions in HIV

## Assisting mental health services

01

Improve mental health services, and address syndemics of HIV care to increase treatment outcomes.

02

Cognitive-behavioral stress management.

03

Provide avenues for peer support.

04

Seeking emotional support from others.

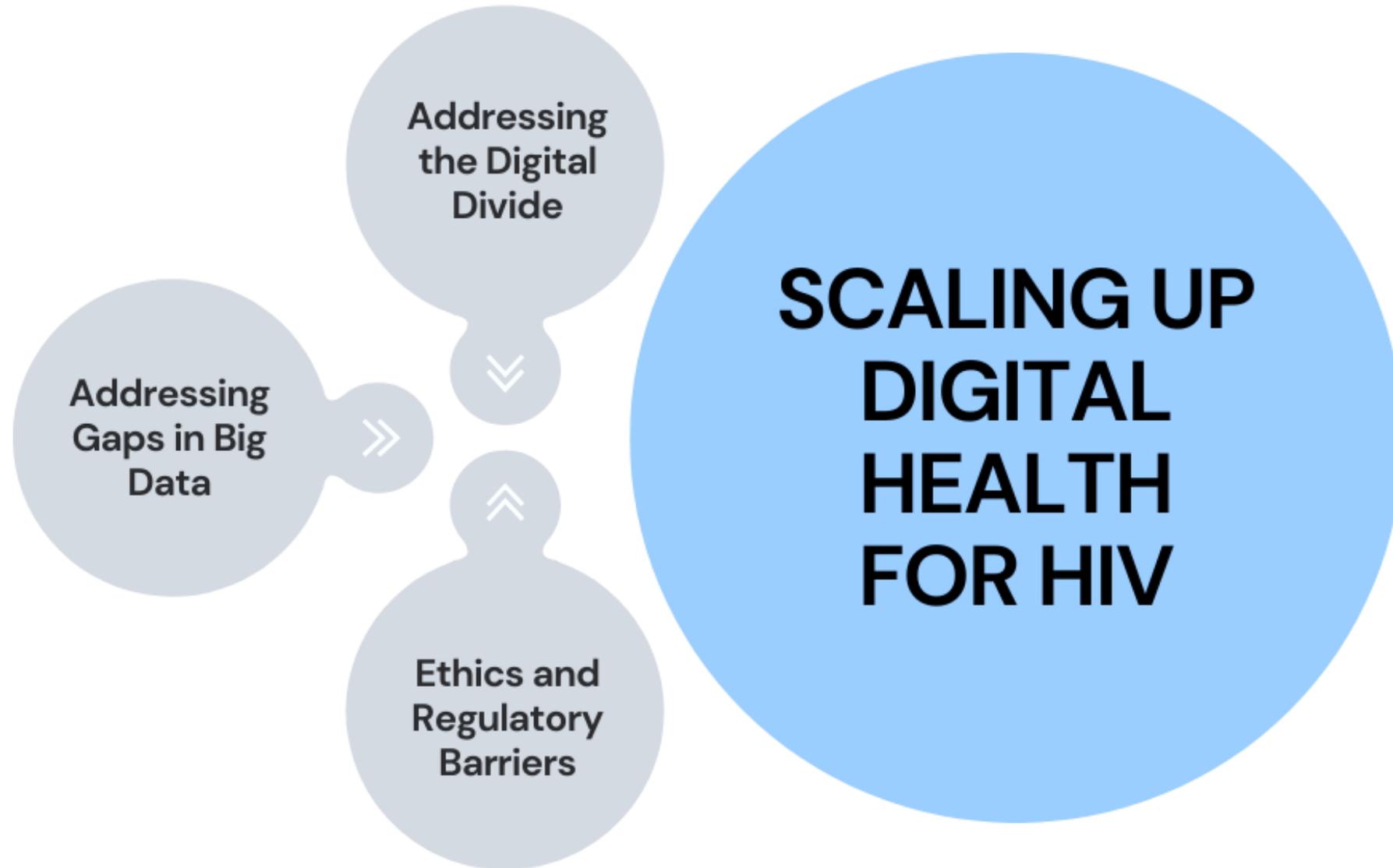
05

Telehealth counselling and mental health support services into HIV care.



Digital Tools	Uses in Health Interventions	Challenges & Gaps	Sustainability & Scale-up
<p><b>Smartphones &amp; Personal devices</b></p>	<ul style="list-style-type: none"> <li>◆ Smartphone-based apps (online shopping, phone calling, education, treatment support, etc)</li> <li>◆ Social media (awareness creation, services promotion, secondary distribution of HIVST)</li> <li>◆ SMS (text-based reminders, patient follow-up calls)</li> <li>◆ GIS (Real-time monitoring, contact tracing)</li> <li>◆ Community engagement (social innovation like crowdsourcing)</li> <li>◆ Data &amp; research ( online surveys, FGDs, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Requires access to smartphones and personal devices</li> <li>◆ Unhindered access to bandwidth and data</li> <li>◆ Telecommunication charges</li> <li>◆ Data leaks due to theft or hacks</li> <li>◆ Technology needs to be tailored to fit cultural settings and target populations.</li> <li>◆ Policy and regulatory barriers</li> </ul>	<ul style="list-style-type: none"> <li>🔴 - Improve knowledge, attitudes, and perceptions of stakeholders on digital interventions</li> <li>🔴 - Expand user capacity building strategies</li> <li>🔴 - Simplify procedures for use of digital tools within specific local context needs</li> <li>🔴 - Develop and institute strict data and cyber security policies</li> <li>🔴 - Establish regulatory bodies and infrastructure to standardize use of digital tools in HIV services delivery</li> <li>🔴 - Guidelines to integrate digital tools into existing healthcare systems</li> <li>🔴 - Multi-sector collaborations between government and telcos to subsidize bandwidth and data cost of health apps use.</li> </ul>
<p><b>Electronic records &amp; Big data</b></p>	<ul style="list-style-type: none"> <li>✿ Surveillance (monitoring &amp; reporting systems, facility record keeping)</li> <li>✿ Prompt interventions</li> <li>✿ Real-time data capturing</li> <li>✿ Data modelling and predictions (machine learning, artificial intelligence)</li> </ul>	<ul style="list-style-type: none"> <li>✿ Ethical concerns</li> <li>✿ Risk of privacy and security breach</li> <li>✿ Data may not be representative of the larger population</li> <li>✿ Genetic favoritism by service providers</li> <li>✿ Risk of false predictions</li> </ul>	
<p><b>Clinical tools &amp; Telehealth</b></p>	<ul style="list-style-type: none"> <li>■ Digital diagnostic apps (smartphone-based electronic readers, point-of care testing,)</li> <li>■ Improved laboratory and surgical tools (eg.)</li> <li>■ Remote patient monitoring (online patient logs, online counseling, online consultation, etc)</li> <li>■ Referral and navigation systems</li> </ul>	<ul style="list-style-type: none"> <li>■ Lack of regulations</li> <li>■ Cost</li> <li>■ Lack of proper infrastructure (especially in LMICs)</li> <li>■ Data security risks</li> <li>■ System security risks</li> </ul>	

Crowdsourcing For Health



# How Can We Scale Up Digital Health for HIV?

## Addressing the Digital Divide

Expensive and low mobile network coverage is LMICs.<sup>8</sup>



Unhindered digital access and subsidized cost of bandwidth to deepen digitization processes.

Consideration for the prevailing digital ecosystem (i.e. technology availability, technological savvy and digital health literacy)

# How Can We Scale Up Digital Health for HIV?

Some key issues in the use of big data.<sup>9</sup>



## Demographic gaps in big data

Whose data and does it reflect the most vulnerable?



## Anonymization of big data

Possibility of re-identification of de-identified genomic and implications for the use of big data in HIV? <sup>10</sup>



## Stigma and group implications

Will big data create further stigma or influence decisions negatively to impact the vulnerable groups?



## Ethics of Digital Technologies and Regulatory Barriers

How to safeguard patient data and privacy?  
Need for country-specific digital health regulatory frameworks.<sup>11</sup>

# Howal Can We Sce Up Digital Health for HIV?

## Digital Health Must Include Communities

### Increasing community engagement in research alongside digitizing research <sup>12</sup>

- ▶ For trial processes to decentralize care and crowdsourcing to develop trial components.
- ▶ To amplify and diversify participant voices in qualitative research.

### Citizen science activities in digital health <sup>13</sup>

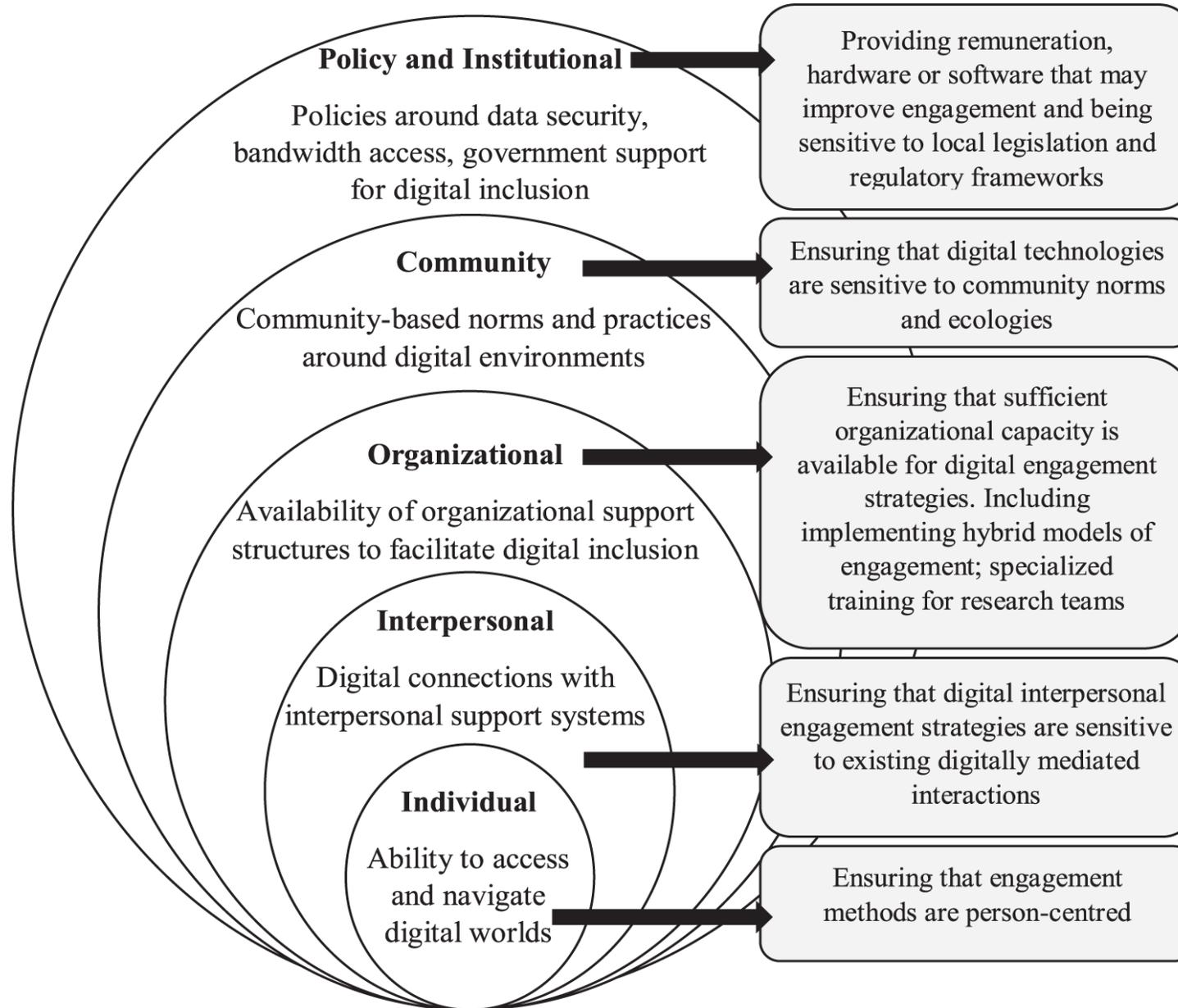
- ▶ Defining problems with communities
- ▶ Co-construction of data curation processes
- ▶ Participatory modelling
- ▶ Interpretations grounded in lived experiences
- ▶ Co-creating data visualization and dissemination plans



# Thank You!

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# Appendix<sup>13</sup>



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