INCEPTION PAPER

DIGITAL HEALTH AND RIGHTS: CONTEXT IN THREE COUNTRIES

GHANA | VIETNAM | KENYA

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More information on the Digital Health and Rights Project:

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TABLE OF CONTENTS

1. OVERVIEW

In the past two decades, digital health interventions have become increasingly widespread globally, with the aim of broadening access to and improving quality of health services, while empowering people to have greater control of their health and well-being. However, in the Global South, structural and systemic factors (racism, gender inequality, socio-economic inequalities, and other underlying social determinants of health) affect access to health services and information, and this extends to digital health: only 35% of people are connected to the internet.[1] The COVID-19 pandemic has made it even more apparent that internet access is becoming a basic need, and meeting that need will require strengthened Information and Communications Technology (ICT) regulatory systems and investments that center community needs.[2]

This paper was written for *Digital Health and Rights: A Participatory Action Research Project*, which is a research and policy project that brings together social science researchers, civil society activists, and community leaders, and is hosted by the Global Health Centre at The Graduate Institute of International and Development Studies. The paper, an inception paper to inform planning and future research for the project, was co-authored by core project partners at the Global Network of People Living with HIV (GNP+), the Vietnam Network of People Living with HIV (VNP+), the Ghana Network of People Living with HIV (Nap+ Ghana), and KELIN in Kenya, with support and guidance from the Global Health Centre, and input from project partner STOPAIDS. The paper provides an overview of basic demographic and health information, legal and policy frameworks, and trends in digital health in Ghana, Vietnam, and Kenya. It identifies some of the mobile health interventions implemented in the three countries, and some key risks and concerns that may be hiding under the potential of broadened access to healthcare. It is complemented by a paper that develops an overall human rights analysis, and by an internal stakeholder mapping and theory of change which were developed to support advocacy by civil society partners in the project.

For each country, we provide an overview of the following:

- National laws and policies on digital health
- Digital strategies and implementation analysis
- Agencies and institutions involved
- Digital health interventions

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[1] The World Bank Digital Development. (n.d) *Connecting for Inclusion: Broadband access for all*. [Online] Available from: https://www.worldbank.org/en/topic/digitaldevelopment/brief/connecting-for-inclusion-broadband-access-for-all [Accessed 1st June 2021].

[2] Lewis C. (n.d) *Digital divisions: COVID-19 policy and practice and the digital divide in Africa*. Available from: https://africaninternetrights.org/sites/default/files/Charley_Lewis_2.pdf.

Based on this review, we identify reflective questions to consider in the research. It should be noted that this overview is preliminary, and in some cases, guiding frameworks were challenging to find.

The three focus countries for this project differ in significant ways. However, they share common challenges in access to internet and digital technologies, gender inequalities, and challenges in reaching young people living with HIV and criminalised key populations (for HIV, these include gay men and other men who have sex with men, sex workers, transgender people, and people who use drugs) with life-saving health information and services.[3] As all three countries are undergoing rapid digital transformation, they also offer real possibilities for constructive engagement in policy and implementation, based on the evidence and expertise that will be developed through this research project.

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[3] WHO. *Consolidated Guidelines on HIV Prevention, Diagnosis, Treatment and Care for Key Populations.* 2016 Update. Geneva, CH: World Health Organization, 2016.

2. GHANA

2.1   BACKGROUND

Ghana gained independence in 1957, and as a constitutional democracy led by a president, the country has one parliament with chief legislative power whose members are elected through political representation along party lines.[4]

As of January 2021, Ghana's population was 31.40 million, of which 57% is urban and 43% is rural. The two largest cities, Accra and Kumasi, have populations over 1 million (Accra, the largest, has a population of 1,963,264; Kumasi follows closely with 1,468,609). Tamale is the third largest city, but far behind Accra and Kumasi with a population of just over 350,000.[5]

Ghana's population is young, with a median age of 21, and with 57% of the population under the age of 25. The Akan people of Ghana make up 47% of the country's population, and other ethnic groups include the Mole Dagbon, Ewe, Ga Games, Gurma, Guang, the Grusi, the Kusaasi, and the Bikpakpaam a.k.a. Konkomba people. 4.3% of the population is white. Southern Ghana has experienced rapid economic development, while Northern Ghana remains rural, and this divide drives significant migration to the south.[6]

As is common throughout many parts of the world, spirituality and religion are ways in which Ghanaians build community and a sense of belonging. The country is predominantly Christian (60%), with a significant Muslim population concentrated in the Northern region, and about 20% of the population practices traditional African religion.[7] Arguably, this impacts how certain communities integrate into society, and how women and youth participate in the economy. This conservatism is reflected in Ghana's laws, as Section 104 of the Ghanaian Criminal Code of 1960 contains provisions criminalising consensual same-sex sexual acts between males (the same code also criminalises bestiality and rape). Sex work is illegal, and access to sexual and reproductive health services, particularly abortion, is restricted to cases of rape or incest, or to cases where abortion is needed for protection of mental and physical health.

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[4] Friederich-Ebert-Stiftung Ghana (2011). *The law-making process in Ghana: Structures and procedures.* Available at: https://library.fes.de/pdf-files/bueros/ghana/10506.pdf (Accessed 8 June 2021).

[5] World Population Review: Ghana. Available at: https://worldpopulationreview.com/countries/cities/ghana

[6] World Bank (2011). Tackling poverty in Northern Ghana. Report. Available at: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/445681468030627288/tackling-poverty-in-northern-ghana.

[7] Globe Aware. Ghanaian Culture. Available at: https://globeaware.org/component/k2/item/5762-ghanaian-culture

Ghana has made impressive strides in improving its healthcare system. By 2014, infant mortality had declined by 50% from levels in 1995, and under 5 deaths by 25%.[8] Overall life expectancy has also increased by +-4%, which can be attributed to increased healthcare expenditure over the years. Although the country did not meet its Millennium Development Goals for maternal mortality, Ghana did succeed in reducing the mortality rate from 760 per 100,000 live births in 1990 to 319 per 100,000 live births in 2015. Private spending on healthcare is still higher than the recommended WHO threshold, but has declined in the last 10 years.[9]

As of 2019, there are over 340,000 people living with HIV in Ghana, with a prevalence rate of 1.7 (210,000 of these people are women aged fifteen or older).[10] Tuberculosis incidence has improved since 2000 (from 216 per 100,000 people to 144 per 100,000 people in 2019), with males affected the most (2:1), especially those over 45 years old.[11] Ghana has successfully contained the COVID-19 pandemic as of this writing, with a total of 94,000 cases, a recovery rate of over 95%, and fewer than one percent of infections resulting in death. Over 800,000 COVID-19 vaccines have been administered to date.[12]

Despite this progress, access to public health services is limited in Ghana, and remains challenging for people in rural areas and for low-income households. While some medical professionals are drawn to rural Ghana to acquire clinical skills and experience, the future recruitment of medical professionals to Northern Ghana is expected to be challenging.[13] Rural and Northern Ghana are also dominated by traditional practices that limit women's bodily autonomy, and therefore affect access to sexual and reproductive health services in addition to other health services. The rise of digital health technologies has the potential to exacerbate this limitation, due to lack of infrastructure for those in remote communities. While many younger women in urban areas are aware of, and can access contraception, there is an unmet need for family planning for married women.[14]

Like many developing countries, Ghana's internet access and smartphone penetration is stratified, with just 50% (15.7 million) of the population connected to the internet, most of whom

[8] Adua, E., Frimpong, K., Li, X., & Wang, W. (2017) Emerging issues in public health: a perspective on Ghana's healthcare expenditure, policies and outcomes. *EPMA Journal* 8(3): 197-206. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5607056/

[9] Adua et al (2017) Emerging issues in public health.

[10] UNAIDS. (2019) *Ghana country factsheets.* [Online] Available from: https://www.unaids.org/en/regionscountries/countries/ghana [Accessed 1st June 2021].

[11] Knoema. Atlas. Ghana Incidence of Tuberculosis. Available at: https://knoema.com/atlas/Ghana/Incidence-of-tuberculosis ; and CCM Ghana. Tuberculosis in Ghana. Available at: https://ccmghana.net/index.php/principal-recipients/2018-2020/tuberculosis

[12] Ghana Health Service. Covid-19 outbreak updates. Available at: https://www.ghanahealthservice.org/covid19/

[13] Amalba A. et.al. (2018) Working among the rural communities in Ghana - why doctors choose to engage in rural practice. *BMC medical education* 18(1), 1-9 Available from: https://bmcmededuc.biomedcentral.com/track/pdf/10.1186/s12909-018-1234-y.pdf.

[14] Fosu, G. B. (1986) Fertility and family planning in Accra. *Journal of biosocial science* 18(1), 11-22. Available from: https://pubmed.ncbi.nlm.nih.gov/3944146/ .

are in urban areas. However, overall mobile penetration is 90% (41.6 million), and digital health interventions have been implemented through mobile health, including through SMS and toll-free calls.[15] Access to the internet via mobile devices has increased from 2% of the population in 2005, to 45% today; thus, many more people are able to access the internet on their mobile devices than from a personal computer.[16] More granular data would help in understanding whether people have access to feature phones instead of smartphones; not all those with smartphones have access to the internet, or even network coverage. Ghana was reportedly one of the first countries in Africa to launch a cellular mobile service and to connect to the internet.[17] In 2021, Twitter announced it would establish its regional African headquarters in Ghana, thanks to the country's commitments to free speech and open access.[18]

Digital Gender Divide - Like most other countries, Ghana faces a digital gender gap, with 2.5 million fewer women online than men.[19] Women are granted equal rights under Ghana's Constitution, but in practice, gender inequality is a significant issue. According to Ahonsi and colleagues, child marriage remains a challenge as it is encouraged by the major religious traditions, is important for women's status, and is seen as a solution to poverty. Their survey found that two in ten girls married as children.[20] Women living with HIV are also more likely to face challenges in accessing healthcare when disclosing their status, and they are less likely to be employed or financially secure.[21]

Younger women, however, have more online access than older women. This is one of the reasons older women often rely on younger relatives to access information. Our observation is that while older women have phones, these are often basic feature phones with no access to smartphone features. As younger relatives sometimes access online health information for older women, this may lead to mothers developing closer relationships with their daughters, due to general trust among this intergenerational group. Anecdotally, we have observed in Northern Ghana that younger women end up asking their mothers to buy certain types of smartphones which the younger women mostly use. It would be interesting for this project to explore how these

[15] Kemp, S. (2021) *Digital 2021: Ghana*. [Online] Available from: https://datareportal.com/reports/digital-2021-ghana (Accessed 1st June 2021)

[16] Omondi ,Gregory (2020). The state of mobile in Ghana's tech ecosystem. Retrieved from: https://www.gsma.com/mobilefordevelopment/blog/the-state-of-mobile-in-ghanas-tech-ecosystem/

[17] GhanaWeb (no date). "Science and technology". Web page. Available at https://www.ghanaweb.com/GhanaHomePage/technology/ (Accessed 8 June 2021).

[18] Business Insider (2021). "Twitter chooses Ghana as its African headquarters, says it's due to country's support of free speech." *Business Insider SA,* Apr. 13. Available at https://www.businessinsider.co.za/twitter-opens-africa-headquarters-in-ghana-2021-4 [Accessed 5 June 2021].

[19] https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf

[20] Ahonsi, B., Fuseini, K., Nai, D., Goldson, E., Owusu, S., Ndifuna, I., Humes, I., Tapsoba, P.I. (2019) Child marriage in Ghana: evidence from a multi-method study. *BMC women's health* 19(1), 1-15. Available from: https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-019-0823-1

[21] Owusu, A. Y. (2020) A gendered analysis of living with HIV/AIDS in the Eastern Region of Ghana. *BMC Public Health*. [Online] 20, 1-15 Available from: https://link.springer.com/content/pdf/10.1186/s12889-020-08702-9.pdf

dynamics play out for older women in cases where they want to access personal and confidential health information.

Young adults living with HIV in Ghana who were consulted on the design of this project, advised that they prefer to seek sexual and reproductive health information online rather than in clinics (particularly young adults living in more conservative Northern Ghana) as doing so enables them to preserve anonymity and avoid stigma. This may be especially important for young key populations, who reportedly face "stigma and discrimination at both the community and facility level, shortages of HIV test kits, and gender bias in testing, i.e. testing more focused on women than on men" in Ghana.[22] A People Living with HIV Stigma Index currently underway in Ghana should reveal more on this subject that can inform this research study.

2.2   NATIONAL POLICIES AND LAWS ON DIGITAL HEALTH

Ghana is in the early stages of developing new digital strategies and policies, reviewed further in this section. The case of Ghana is interesting because there seems to be readiness for digital technology from a policy perspective. However, there is not yet substantial evidence of investment in ensuring equitable digital infrastructure.

From 2000-2010, Ghana released the following policies on digital health:

1. *ICT for Accelerated Development (ICT4AD) Policy*
2. *Health Sector's ICT Policy and Strategy*
3. *Ghana e-Health Strategy 2010.* [23]

The following agencies and institutions have contributed to the development of these strategies and policies:

- The National Information Technology Agency
- The Ministry of Health
- The School of Public Health of the University of Ghana
- The Kofi Annan Centre of Excellence in ICT
- Vodafone Ghana
- Centre for Health Information Management
- Ghana Health Service

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[22] Ibid.

[23] Afagbedzi, S. K., Obuobi, H., Aryeetey, R., & Bosomprah, S. (2013) A Review of Ghana's E-health Strategy. *Journal of Health Informatics in Africa*. [Online] 1(1) Available from: https://jhia-online.org/index.php/jhia/article/view/52/50

These are discussed below. As not all current papers and strategies were publicly available, the paper only discussed those that could be accessed at time of publication, as well as the broader *Data Protection Act*.

1. The ICT4AD Policy aims to engineer an ICT-led socio-economic development process with the potential to transform Ghana into a middle-income, information-rich, knowledge-based, and technology-driven economy and society.[24] The policy is centered on the role technology can play in economic development, and on turning Ghana's young population into an asset for this development. The specific objectives of the policy include:

- To support the development of a viable knowledge-based ICT industry to facilitate the production, manufacturing, development, delivering, and distribution of ICT products and services
- To facilitate a wide-spread deployment and exploitation of ICTs within the society to support the delivery of health and social services
- To accelerate the development of women and eliminate gender inequalities in education, employment, and decision making through the deployment and exploitation of ICTs by building capacities and providing opportunities for girls and women
- To facilitate the development and implementation of the necessary legal, institutional and regulatory framework and structures required for supporting the deployment, utilization and the development of ICTs
- To facilitate the development and promotion of the necessary standards, good practices, and guidelines to support the deployment and exploitation of ICTs within the society and economy

2. The Health Sector's *ICT Policy and Strategy* (2005) drew from the ICT4AD Policy, with a focus on strengthening the health sector's ICT infrastructure from a health information management standpoint.[25] As of 2021, the Ghana Health Service is considering future plans to develop a new Digital Transformation in Health Policy.[26]

3. The Ghana *eHealth Strategy* was developed in 2010, in the wake of the 2009 Annual Ministerial Review of the United Nations Economic and Social Council, held in Accra. It highlights the following key priorities:
- Streamlining the regulatory framework for health data and information management
- Building sector capacity for wider application of eHealth solutions in the health sector

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[24] The Republic of Ghana. (2003. The Ghana ict for accelerated development (ICT4AD) policy. [Online] Available from: https://moc.gov.gh/sites/default/files/downloads/Ghana-ICTAD%20Policy-Master-final-2.pdf [Accessed 1st June 2021]

[25] Ghana Health Sector ICT Policy and Strategy. July 2005. Available at: https://www.ghanahealthservice.org/downloads/Health%20Sector%20ICT%20Policy%20and%20Strategy.pdf

[26] E-mail communication, September 14, 2021, Dr. Wisdom Atiwoto, Data Science and Digital Health Specialist, Ghana Health Service.

- Increasing access and bridging equity gap in the health sector through the use of ICT
- Towards a paperless records and reporting system

The potential for Ghana's digital future lies in development of future plans to put these policies into action. [27] This shift towards digital health could position Ghana to progress towards truly equitable access to digital, mobile, and eHealth services if these approaches are patient-centered.

Ghana has been relatively slow to adopt eHealth, with most hospitals only partially digitized.[28] Studies have identified challenges in upskilling health service personnel to manage new digital technologies, as well as additional burdens these technologies can place on frontline health workers in rural areas.[29] Although the strategy provides a basic framework for future development of digital health services, it does not address the need to expand eHealth in remote and rural communities, which make up close to 50% of the country's population. New plans to scale up eHealth are under development with international partners. In addition, the piloting and implementation of interventions such as the DHIS2 Tracker to monitor treatment and care for people living with HIV and affected by TB offers opportunities to improve health services for harder-to-reach rural and marginalized communities.[30]

In addition to the strategies and policies outlined above, in 2012, Ghana enacted a **Data Protection Act** as a major step toward an ethical approach to digitization, and established a Data Protection Committee.[31] Bekoe argues that this act does not play a significant role in e-government implementations, and that the main source of hesitancy about adoption of e-services may stem from a reported lack of trust in the government due to corruption.[32] Similarly, women have also expressed a lack of trust of the government and private sector when it comes to data

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[27] International Society For Telemedicine & Ehealth. (2010) *Ghana National E-Health Strategy*. Available from: https://www.isfteh.org/files/media/ghana_national_ehealth_strategy.pdf [Accessed 1st June 2021].

[28] Kesse-Tachi, Agyenna, Alexander Ekow Asmah, and Ebenezer Agbozo (2019). "Factors Influencing Adoption of EHealth Technologies in Ghana." *Digital Health* 5 (January 1): 2055207619871425. https://doi.org/10.1177/2055207619871425; Preko, Mansah, and Richard Boateng. "Assessing Healthcare Digitalisation in Ghana: A Critical Realist's Approach." *Health Policy and Technology* 9, no. 2 (June 1, 2020): 255–62. https://doi.org/10.1016/j.hlpt.2020.03.006.

[29] Ogoe, Henry A., James A. Asamani, Harry Hochheiser, and Gerald P. Douglas. "Assessing Ghana's EHealth Workforce: Implications for Planning and Training." *Human Resources for Health* 16, no. 1 (November 27, 2018): 65. https://doi.org/10.1186/s12960-018-0330-8; and Mariwah, Simon, Albert Machistey Abane, Samuel Asiedu Owusu, Adetayo Kasim, Elsbeth Robson, Michele Castelli, and Kate Hampshire. "Formalising 'Informal' MHealth in Ghana: Opportunities and Challenges for Universal Health Coverage (UHC)." *Global Public Health* 0, no. 0 (January 24, 2021): 1–14. https://doi.org/10.1080/17441692.2021.1874467

[30] DHIS2 (no date). "Changing How DHIS2 Tracker Is Used in Ghana Eases Workload," and "Ghana supports all TB burden district hospitals with DHIS2 Android." Web pages, DHIS2.org. Retrieved from https://dhis2.org/ghana-tracker-user-story/.

[31] Ghana Data Protection Commission (no date). About the Commission. Web pages, https://www.dataprotection.org.gh/

[32] Bekoe EA. Empirical observation of the role of privacy and data protection. 2013. Available from: https://dora.dmu.ac.uk/bitstream/handle/2086/11150/Eric%20Agye-Bekoe%20PhD%20Thesis%20report.pdf?sequence=1

protection. Women have specific privacy concerns, especially in relation to their sexual and reproductive health, and addressing this lack of digital trust among women will be crucial to the success of digital health in Ghana.[33]

2.3 MOBILE HEALTH INTERVENTIONS

A 2014 scoping review found 21 eHealth projects under development and evaluation in Ghana.[34] Mariwah and colleagues describe Ghana's mHealth experience as fragmented into "time-limited, small-scale pilot projects" which rarely go to scale.[35]

Relevant to the Digital Health and Rights project, the following interventions have been identified:

- **MOTECH (Mobile Technology for Community Health)**
  This pilot digital platform aims to improve uptake and quality of care for maternal, newborn, and child health services (MNCH) "through the use of low-cost phone technology to capture, transmit and process health service data collected by Community Health Nurses".[36]

- **Launched September 2008: Text Me! Flash Me! Helpline**
  The Text Me! Flash Me! Helpline uses cell phone technology to provide key populations in Ghana with friendly and accessible HIV and other STI information, referrals, and ART reminders through SMS and counseling services from qualified providers. These services are opt-in, so only those that feel comfortable in sharing their mobile number with the project receive messages.[37]

- **SMS for Life**
  This platform aims to prevent malaria and other medicine stock-outs at the remote health facility level in sub-Saharan Africa. Each week, automatic SMS text messages are sent to mobile phones at health facilities requesting information on current stock levels and

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[33] Chair C, Brudvig I & Cameron C. World Wide Web Foundation. Publication: Women's Rights Online. 2020. Pg 17.

[34] Afarikumah, E. (2014). Electronic health in Ghana: current status and future prospects. Online journal of public health informatics, 5(3), 230.

[35] Mariwah et al (2021). "Formalising 'Informal' MHealth in Ghana".

[36] Ibid.

[37] Henry, N. (2020) *Text Me! Flash Me! Call me!* [Online] Available from: https://lib.digitalsquare.io/handle/123456789/77627 [Accessed 1st June 2021]

disease surveillance. Responses are reported via SMS, centrally stored in a database, and made accessible to key healthcare staff via the internet and email.[38]

- **2012-2014: EMPower II**
  A key component of the EMPower II Project was raising awareness among PLHIV about key behaviors that prevent the transmission of HIV. To reach the largest number of people, the project used bulk text messaging to confidentially communicate important HIV prevention and treatment messages to subscribers.

- **SHEPLUS**
  This civil society-led platform promotes sexual health education. In Ghana, for young people to ask questions about SRH is considered immoral. There is no charge, as SHEPLUS is a toll-free number. Users explain their problem over the phone to nurses who attend to the caller or refer them to a doctor via the call. In initial consultations with young people living with HIV in Ghana for this project, SHEPLUS was identified as a positive and valued tool.

- **Social Media**
  Young people living with HIV consulted for this project shared that they often access health information through social media platforms such as Whatsapp or Facebook. They were not aware of any privacy risks linked to these platforms. Some shared that they had experience with health misinformation and with charlatans on social media.

2.4   ANALYSIS: DIGITAL HEALTH AND RIGHTS IN GHANA

The development of new strategies and policies for digital health governance offers opportunities for the Digital Health and Rights project to engage government ministries based on the research results. The new policies and strategies do not address some issues where this project could make a contribution, including:

- Community capacity building, developing infrastructure, and expanding access to the internet and to digital technologies – especially for women, people living with and vulnerable to HIV, and rural communities
- Privacy and security issues for key populations and young women, given Ghana's context of criminalising same-sex sexuality, sex work, and limited abortion access

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[38] Ziegler, R. (2020) *SMS FOR LIFE Preventing malaria and other medicine stock-outs at the remote health facility level in sub-Saharan Africa.* [Online] Available from: https://lib.digitalsquare.io/handle/123456789/77684 [Accessed 1st June 2021]

- Lack of data and privacy literacy among young women (and women in general), key populations, and people living with HIV

Most digital health interventions in the country are implemented through basic mobile services. This may be because most communities cannot access the internet, so the best channel for remote healthcare is through the use of telephones, SMS, and toll-free calls. This poses its own dangers, as digital health strategies and policies do not discuss the issues of privacy and security in using these specific tools.

Broader factors such as the gender divide in digital and mobile access will shape how digital heath may either empower or further marginalize vulnerable communities. The ICT4AD policy does allude to exploring ICT as a social enabler, bridging gaps related to access. However, there is no indication or progress measure in this regard, nor is there a reference to this in the eHealth strategy.

3. VIETNAM

3.1 BACKGROUND

The Socialist Republic of Vietnam was established in 1976, following reunification of the country. The Constitution of the Socialist Republic of Vietnam, adopted in 1992, established an elected president and an unicameral national assembly, with members elected directly. The country is divided into more than 64 provinces (*tinh*). The Vietnamese Communist Party is institutionalized as the sole source of leadership of the state and society. Since the 1980s, Vietnam has undergone a period of economic liberalization and rapid economic growth.

As of July 2020, Vietnam had an estimated population of 98.7 million, of which 37.3% is urban and 62.7% is rural. The population is considered young, with 60% under 56 and a median age of 32.[39] The Viet (Kinh) people account for 87% of the country's population, and they mainly inhabit the Red River Delta, the Central Coastal Delta, the Mekong Delta and major cities. The country's 53 other ethnic minority groups, totalling over 8 million people, are scattered over mountain areas covering two-thirds of the country's territory, and spreading from the North to the South.[40] Among ethnic minorities, the largest groups are Tay, Thai, Muong, Hoa, Khmer, and Nung with a population of around 1 million each. Related ethnic groups are spread across neighboring areas of upland Southeast Asia. The capital of Vietnam, Hanoi, is located in the north; the largest city, Ho Chi Minh City, is located in the south.

Although the Millenium Development Goals of reducing new TB infections were reached successfully, TB remains one of the most common communicable diseases in Vietnam. USAID estimates 17,000 TB deaths annually.[41]

According to the latest reports to UNAIDS, the HIV prevalence rate in Vietnam is low, at 0.3 per cent; there are approximately 230,000 people living with HIV (5,200 children aged 0-14; 70,000 women aged 15 and over; 150,000 men aged 15 and over).[42] HIV appears to be increasing slightly among key populations, including men who have sex with men (10.8% as of 2018).[43]

Same-sex sexual behavior is not criminalized in Vietnam. In neighboring countries in Asia, there has recently been a sharp increase in HIV transmission among people who engage in sexualised

[39] Index Mundi. (2020) Vietnam Demographics Profile. [Online] Available from: https://www.indexmundi.com/vietnam/demographics_profile.html [Accessed 1st June 2021]

[40] Socialist Republic of VietNam Government Portal. (2021) Ethnic groups in Vietnam. [Online] Available from: http://www.chinhphu.vn/portal/page/portal/English/TheSocialistRepublicOfVietnam/AboutVietnam/AboutVietnamDetail?categoryId=10000103&articleId=10002652 [Accessed 1st June 2021]

[41] USAID Fact Sheet. Tuberculosis in Vietnam. [ND]. Available at: https://www.usaid.gov/sites/default/files/documents/1861/TuberculosisFactSheet_Eng.pdf

[42] UNAIDS. (2019) Vietnam country factsheets. [Online] Available from: https://www.unaids.org/en/regionscountries/countries/vietnam

[43] Tuan NA, Johnston LG, Thanh DC et al (2020). "Increasing HIV prevalence and injection drug use among men who have sex with men in Ho Chi Minh City, Vietnam". Int J STD AIDS 31(13):1247-1254. doi: 10.1177/0956462420947555.

drug use and chemsex.[44] These psychoactive substances (such as cocaine, amphetamine-type stimulants [or ATS, excluding MDMA] as well as new psychoactive substances [NPS]) can cause euphoria, enhance pleasure, raise libido, reduce inhibitions, and enable sexual performance for longer durations.[45] They are increasingly widely used by young men who have sex with men, transgender people, and sex workers in Southeast Asia, and are associated with higher rates of HIV infection and other sexually-transmitted infections. One third of Thai men who have sex with men report preferring substance use during sexual intercourse.[46] Research is currently underway into these practices in Vietnam in order to design community-based prevention interventions. Vietnam has also taken measures to address HIV-related stigma and discrimination in healthcare settings.[47]

In the first year of the COVID-19 pandemic, Vietnam had relatively few cases and was considered a success story.[48] As of this writing, a sharp increase in COVID-19 cases from June 2021 to August 2021 has led the government to impose stricter restrictions.

Despite its status as a low- and middle-income country (LMIC) and its recent challenges with COVID-19, Vietnam has made significant progress in health, with an annual healthcare expenditure of just US$123 per capita, and has successfully met the 2030 Sustainable Development Goals target for mortality reductions (including maternal mortality, under-five mortality, and infant mortality). Additionally, Vietnam's life expectancy is 76 years, which is higher than most countries in the region. Access to health services in Vietnam also ranks high on the World Bank's Human Capital Index with a score of 0.67, which is higher than both the LMIC average of 0.48 and the upper-middle-income country average of 0.58.[49]

Studies find that Vietnam's population "is adopting digital technology at lightning speed", with internet access and availability high compared to neighbouring countries such as Laos, Cambodia, and even Thailand, a country with a GDP twice that of Vietnam.[50] As of 2019, the World Bank estimated that there were a total of 68.7 million internet users in Vietnam, which is

[44] UNODC, WHO and UNAIDS. HIV prevention, treatment, care and support for people who use stimulant drugs: Technical guide. 2019.

[45] UNODC, WHO and UNAIDS, Technical guide, p. 14.

[46] Boonchutima S, Kongchan W. 60. Utilization of dating apps by men who have sex with men for persuading other men toward substance use. Psychol Res Behav Manag [Internet]. 2017;10(101514563):31–8. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=prem2&NEWS=N&AN=28138269

[47] Ikeda DJ, Nyblade L, Srithanaviboonchai K, Agins BD (2019). A quality improvement approach to the reduction of HIV-related stigma and discrimination in healthcare settings. BMJ Global Health;4:e001587. doi:10.1136/ bmjgh-2019-001587.

[48] Worldometer. Vietnam COVID. Available online at: https://www.worldometers.info/coronavirus/country/viet-nam/ (Accessed 8 June 2021).

[49] Shaaban, N. (2020) Digital Health Entrepreneurship in Vietnam: Systems, stakeholders, and opportunities. MIT Legatum Center for Development and Entrepreneurship Working Paper Series: #1. [Online] Available from: https://legatum.mit.edu/wp-content/uploads/2020/07/Digital-Health-Vietnam-MIT-Legatum-Center.pdf

[50] InSTEDD. (2018) Opportunities and Obstacles for Digital Technology in Vietnam's Public Health Systems. Weblog. Available from: https://instedd.org/blog/opportunities-and-obstacles-for-digital-technology-in-vietnams-public-health-systems/ [Accessed 1st June 2021]

the majority of the total population.[51] According to the Mobile Marketing Association (MMA)[52] Vietnam can be described as a "mobile-first market", with nearly all internet users (94%) owning a smartphone and three quarters of them using it as their preferred connection device. Smartphone penetration has doubled since 2014; the market now has over 51 million smartphones, representing over 80% of the population aged 15 years and older. More than 91% of daily internet users are between the ages of 25 and 34.[53]

This rapid increase in digitization has occurred in both urban and rural settings. In rural Vietnam, 68% of mobile phone owners have a smartphone, and the rural Vietnamese demographic spends on average three hours connected to the internet each day.[54] Facebook, YouTube, and Zalo (a Vietnamese messaging app) are the most popular platforms — there are over 57 million active users of Facebook, ranking Vietnam among the top ten users of Facebook.[55] According to MMA, both mothers and millennials in Vietnam are motivated to acquire skills and information online, and would use services such as YouTube more frequently if internet data was cheaper and faster, and if there was more educational content available.

Less data is available on the gender divide, but across Asia approximately 23% fewer women access the internet than men.[56] A 2015 USAID study in four cities in Vietnam found that 88.9% of men who have sex with men own a smartphone, and 80% use Facebook regularly.[57]

Nonetheless, given the widespread reliance on digital technologies, Vietnam is poised to have significant potential for digital health development in the future.[58] Many formerly paper-based public sector processes (e.g. applying for a birth certificate or a driver's license) have begun to move online. However, while the health sector has also started to make this shift, e.g. with national disease surveillance and immunization data, it faces challenges with interoperability and a basic health data infrastructure, and digitization has not necessarily penetrated to district and local levels. A 2018 scoping study found that lack of government policy and heavy dependence

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[51] See the World Bank Group for more information:
https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=VN
[52] Mobile Marketing Association. (2019) The State of Mobile in Rural Vietnam Report 2018/2019. [Online] Available from:
https://www.thinkwithgoogle.com/_qs/documents/7268/The_State_of_Mobile_in_Rural_Vietnam_Report.pdf
[Accessed 1st June 2021]
[53] See Statista: https://www.statista.com/statistics/348252/daily-internet-usage-age-group-vietnam/
[54] MMA and Google (2020). The State of Mobile in Rural Vietnam Report 2018/2019, p.5
[55] USAID, PEPFAR, PATH, From online to offline.
[56] GSMA, (2019). The State of Mobile Internet Connectivity 2019.
https://www.gsma.com/mobilefordevelopment/resources/the-state-of-mobile-internet-connectivity-report-2019/)
[57] USAID, PEPFAR, PATH (no date). From online to offline: Using digital and social media to eliminate HIV in Vietnam. Policy brief. Available at: https://path.azureedge.net/media/documents/From_Online_To_Offline.pdf
(Accessed 8 June 2021).
[58] Roth S (2017). Digital health in Viet Nam – not if, but when. ADB blog, 7 April. Available at
https://blogs.adb.org/blog/digital-health-viet-nam-not-if-when (Accessed 8 June 2021).

on foreign funding are obstacles to the development of digital health.[59] Some hospitals have installed their own digital systems to manage patient information, but lack of training and standardized architecture, combined with high existing workloads and high staff turnover, have hindered widespread uptake of digital technology for health.

However, there are indications that COVID-19 has acted as a spur to digital developments in Vietnam: the country's comparatively successful early management of the COVID-19 pandemic included the use of digital apps to identify and isolate outbreaks.[60]

3.2 NATIONAL POLICIES AND LAWS ON DIGITAL HEALTH

Vietnam does not have specific laws that address data protection. The two most relevant and important laws on data protection include:

- Network Information Security Law- which provides the data privacy rights of individual subjects.
- Cybersecurity Law- which grants the government full control of data flow.

Other aspects of data protection are provided in various laws in specific fields (ICT, health, and other ministries.)[61]

The 2018 cybersecurity law, which took effect on 1 January 2019, contains provisions on data localization, government control over online content, and data localization in Vietnam.[62] Data localization means that both onshore and offshore service providers (defined as firms providing services on a telecom network, internet, or other online value-added service, and firms involved in collecting, utilizing, and processing user data, including personal information) are required to store all data about Vietnamese users, including personal information, in Vietnam.

Illegal content, according to the new law, includes:

- **Article 8:** Acts such as inciting people against the state, distorting history, gender discrimination, religious offenses, racism, posting untruthful information, and human

[59] Lam, J. A., Dang, L. T., Phan, N. T., Trinh, H. T., Vu, N. C., & Nguyen, C. K. (2018). Mobile Health Initiatives in Vietnam: Scoping Study. *JMIR mHealth and uHealth*, *6*(4), e106. https://doi.org/10.2196/mhealth.8639

[60] Pollack T, Thwaites G, Rabaa M (2021). Emerging COVID-19 success story: Vietnam's commitment to containment. Exemplars in Global Health, March 5. Available at: https://ourworldindata.org/covid-exemplar-vietnam.

[61] DLA Piper. 6 Jan 2021. Law in Vietnam. Available at: https://www.dlapiperdataprotection.com/index.html?t=law&c=VN

[62] Socialist Republic of VietNam. Law on Cybersecurity. June 12, 2018. Available at: https://www.economica.vn/Content/files/LAW%20%26%20REG/Law%20on%20Cyber%20Security%202018.pdf

trafficking. In addition, it includes network terrorism, cybercrimes, and network attacks on information systems critical to national security.

- **Article 16:** Information with propaganda content against the state that can incite riots, disturb public order, cyber-humiliate, slander, and affect the socio-economic activities of the state.

- **Article 17:** Network espionage behavior that can violate state secrets, users' personal information, and corporate secrets.

- **Article 18:** Using cyberspace in violation of the national security laws, social order, and safety regulations such as selling banned goods, using illegal means of payment, and piracy.

- **Article 29:** Covers the protection of children in cyberspace.

Pursuant to the Cybersecurity Law, in 2021 the Minister of Public Security publicized a Draft Decree on Personal Data Protection which further elaborated measures and sanctions to protect personal data, while retaining the right of state agencies to engage in recording and video surveillance in public places.[63]

Vietnam does not have a national eHealth strategy or policy, and it is unclear whether the cybersecurity law has implications in regards to sexual and reproductive health information, sex work (which is criminalised and punishable by fines), or drug use (which is not criminalised, but can lead to compulsory treatment).

Lam et al. identified the largest threats to the popularity of mobile health initiatives as the absence of government policy, lack of government interest, heavy dependence on foreign funding, and lack of technological infrastructure.[64]

Nonetheless, the advent of COVID-19 appears to have accelerated government interest in and support for digital health initiatives in Vietnam.[65] On June 3, 2020, Prime Minister Phuc signed Decision 749 approving the *National Digital Transformation Program to 2025, with a vision to 2030.* The prime minister tasked the Ministry of Information and Communications and the Ministry of Health to develop technology platforms for healthcare, including telemedicine, to build national databases for healthcare, and to complete a legal framework and technical standards with a view to encouraging digital transformation in the healthcare sector.

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[63] D'Andrea and Partners. 2021. "Vietnam's personal data protection: What is going to change?" Blog post, 30 March. Available at: https://www.dandreapartners.com/draft-of-decree-on-personal-data-protection-in-vietnam/.
[64] Lam, J. et al (2018) 'Mobile Health Initiatives in Vietnam: Scoping Study', JMIR mHealth and uHealth, 6(4): e106. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5941098/
[65] Ziter, P. (2020) *Healthtech has blossomed in Vietnam: The future is now.* [Online] Available from: https://www.lexology.com/library/detail.aspx?g=53870000-7da0-43ae-b921-ff5555532c76

The Ministry of Health, Ministry of Information and Communications, and Ministry of Science and Technology are all involved in digital health in Vietnam. There has not been any evidence of active civil society and community engagement in these processes.

3.3   DIGITAL HEALTH INTERVENTIONS OVERVIEW

In 2019, the Ministry of Health announced plans to implement electronic health records nationwide.[66] Digital health start-up activity in Vietnam is clustered in the following areas: telemedicine, pharmaceutical supply chain, doctor reservations, and outpatient clinics.[67] No specific mobile health interventions focusing on HIV or SRH were identified for this paper.

- **Bluezone**, a government-endorsed smartphone app using Bluetooth low energy technology, supports contact tracing for COVID-19 exposures. The app allows detection of other users within 2 meters and keeps a log of all encounters. If an app user later tests positive for COVID-19, the app will alert those users who have been in close contact about the risk of infection.

- **Facebook** – A "Healthy Markets" project sponsored by USAID, PEPFAR and PATH co-created Facebook groups and is using social media channels to share health information on HIV and safe sex with men who have sex with men and transgender people, linking them with local community-based organizations.[68]

- **Blued,** the most popular dating application in Vietnam, shares information about infectious diseases, sexually transmitted infections, HIV, and PrEP testing with users.

3.4   ANALYSIS: DIGITAL HEALTH AND RIGHTS IN VIETNAM

While technology is rapidly advancing in Vietnam and access to digital technology and the internet is widespread, access to health services for marginalised and criminalised communities remains a concern — especially given the recent increase in HIV among young men who have sex with men, and continuing high rates of TB. This research project can make a contribution to the development of digital health in Vietnam by understanding how young adults, including young

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[66] Koh D (2019). Vietnam to deploy EHR nationwide in July. Blog, APAC, June 24. Available from: https://www.healthcareitnews.com/news/apac/vietnam-deploy-ehr-nationwide-july (Accessed 8 June 2021).
[67] Shaaban, N. (2020) Digital Health Entrepreneurship in Vietnam: Systems, stakeholders, and opportunities. MIT Legatum Center for Development and Entrepreneurship Working Paper Series: #1. [Online] Available from: https://legatum.mit.edu/wp-content/uploads/2020/07/Digital-Health-Vietnam-MIT-Legatum-Center.pdf
[68] PATH (2018). Ministry of Health and Internet innovators discuss the exciting potential of Vietnam's growing social media ecosystem to boost HIV control. Press statement, March 23. Available at: https://www.path.org/media-center/ministry-of-health-and-internet-innovators-discuss-the-exciting-potential-of-vietnams-growing-social-media-ecosystem-to-boost-hiv-control/.

key populations, are accessing health information and services through social media and dating apps, as well as by identifying ways in which communities can be active contributors to the design of future digital health interventions that truly meet their needs.

4. KENYA

4.1   INTRODUCTION

The Government of Kenya is composed of three arms, the Legislature (Parliament), the Executive, and the Judiciary, established under the Constitution of Kenya, 2010.[69] Parliament is the law-making body in the country and is bicameral, consisting of the National Assembly and the Senate. The Executive, made up of the President, the Deputy, and Cabinet, is responsible for the day-to-day management of the state. The Judiciary adheres to a hierarchical system, with the Supreme Court being the highest Court, followed by the Court of Appeal, High Court, Magistrate's Courts, and other subordinates. The Kenyan Judicial system is not devolved, as is the case with both Parliament and the Executive, which have county executive committees and county assemblies within each of the 47 counties in the country.

Kenya has had a devolved healthcare system since 2013, making counties responsible for health service delivery, while the national government retains responsibility for developing health policy, providing technical assistance to counties, and managing national referral health facilities.[70] The devolved healthcare system allows county governments to design interventions that suit the unique sector needs in their various contexts. For instance, in Turukana County, the average distance a person travels to the nearest health facility decreased from 50 kilometers in 2013 to 35 kilometers in 2017, likely due to the construction of 159 new health facilities.[71]

As of November 2019, Kenya had an estimated population of 47,564,296 of which 23.5 million were males, 24 million were females, and 1,524 were intersex.[72] The capital city Nairobi is the most populous county with a total population of 4,397,073. Amongst an ethnically diverse country of 42 tribes, who speak the national languages of Swahili and English in addition to their own native languages, is a predominantly youthful population.[73] In urban areas, the majority of the

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[69] The Constitution of Kenya, 2010 Available from: http://kenyalaw.org/kl/index.php?id=398
[70] The National Council for Law Reporting. (2010) *The Constitution of Kenya, Preamble.* [Online] Available from: http://www.kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=Const2010#KE/CON/Const2010/chap_19 [Accessed 12th May 2021]
[71] Turukana County Government. (n.d) *Turkana County Government County Health Sector Strategic Plan 2018-2022.* [Online] Available from: https://www.turkana.go.ke/wp-content/uploads/2019/10/Untitled.pdf [Accessed 1st June 2021]
[72] Kenya national bureau of statistics. (2019) *Kenya Population and Housing Census Volume I: Population by County and Sub-County.* [Online] Available from: https://www.knbs.or.ke/?wpdmpro=2019-kenya-population-and-housing-census-volume-i-population-by-county-and-sub-county [Accessed 6th May 2021]
[73] Kenya national bureau of statistics. (2019) *Kenya Population and Housing Census Volume III: Distribution of Population by Age, Sex and Administrative Units.* [Online] Available from: https://www.knbs.or.ke/?wpdmpro=2019-kenya-population-and-housing-census-volume-iii-distribution-of-population-by-age-sex-and-administrative-units [Accessed 6th May 2021]

population is between the ages of 20 and 34, while adolescents and teens make up the majority in rural areas.

In 2019, at least 1.5 million Kenyans were living with HIV. New HIV infections are still disproportionately higher among females due to unequal gender norms. All new HIV infections have declined from 75,000 in 2010 to 41,416 in 2019.[74] Sex workers and men who have sex with men carry a greater disease burden, and among young women, HIV prevalence is currently higher than their male peers.[75] Sex work, same-sex sexual behavior, and drug use are crimianlised in Kenya.[76] The estimated TB incidence in Kenya in 2019 was 140,000 and was higher in males than females, particularly for those between the ages of 25 and 44 years.[77] As of 2 June 2021, there have been 208,262 confirmed cases of COVID-19 in Kenya, 4,057 recorded deaths, and a total of 2,143,100 people have been vaccinated.[78] The country has also been grappling with the 'shadow pandemic', which refers to the increase in gender based violence cases, unintended pregnancies, and contraceptive stockouts[79].

Kenya, sometimes referred to as the "Silicon Savannah", has rapidly embraced digitization, a process accelerated by the COVID-19 pandemic. In December 2020, data and internet subscriptions went up to 44.4 million from 39.6 million in 2019.[80] ICT is quickly playing a pivotal role in combating the pandemic. While speaking at a forum to launch a pilot telemedicine project, the Kenyan Cabinet Secretary for health noted, *"highly skilled healthcare workers' distribution in Kenya is skewed towards urban sites, leaving the rural areas poorly staffed...this unequal distribution affects healthcare infrastructure as well and therein lies the advantages of ICT"*.[81]

There has also been an increase in mobile subscriptions (individuals may have more than one) which went up to 61.4 million in December 2020 from 54.5 million in December 2019.[82] The 2019

[74] Kenya AIDS Strategic Framework II (2020/21-2024/25), pg. 7, 9 and 11 [Online] Available from: https://nacc.or.ke/wp-content/uploads/2021/01/KASFII_Web22.pdf [Accessed 2nd June 2021]

[75] UNAIDS (2020). Key Populations Atlas, Online database. Retrieved from https://kpatlas.unaids.org/dashboard#/home (Accessed 5 June 2021).

[76] UNAIDS (2020). Key populations atlas.

[77] World Health Organization (WHO) 2021. Tuberculosis profile: Kenya. Online database. Available from:https://worldhealthorg.shinyapps.io/tb_profiles/?_inputs_&lan=%22EN%22 [Accessed 3 June 2021]

[78]Ministry of Health (Kenya) Available from: https://www.health.go.ke [Accessed 3 June 2021]

[79] A,Maleche, N,Were, T, Imalingat (April 2021),' Covid-19 in Kenya a Year Later: A Case of Deja Vu', Available from: https://verfassungsblog.de/covid-19-in-kenya-a-year-later-a-case-of-deja-vu/

[80] Communications Authority of Kenya (October- December) Second Quarter Sector Statistics Report for the Financial Year 2020/2021 pg 17, Available from: https://ca.go.ke/wp-content/uploads/2021/03/Sector-Statistics-Report-Q2-2020-2021-1.pdf

[81] Benjamin Muriuki (April 2021),' CS Kagwe tells global forum Kenya committed to digital Health and exploring Telemedicine with Huawei' Available from: https://citizentv.co.ke/news/cs-kagwe-tells-global-forum-kenya-committed-to-digital-health-and-exploring-telemedicine-with-huawei-10712166/

[82] Communications Authority of Kenya (October-December), Second Quarter Sector Statistics Report for the Financial Year 2020/2021, pg 9 Available from: https://ca.go.ke/wp-content/uploads/2021/03/Sector-Statistics-Report-Q2-2020-2021-1.pdf

country census revealed that 43.5% of Kenyans owned a mobile phone.[83] Out of the 20.6 million Kenyans that own a mobile phone, 10,425,040 are females and 10,268,651 are males. As of January 2021, 96.1% of the population are accessing the internet via mobile phones, and consequently, the majority of internet users (99.7%) are using smartphones instead of other connectivity devices such as laptops or tablets to access the internet[84]. The rural-urban divide in Kenya continues to act as a hindrance towards an inclusive digital economy with 44% of the urban population having access to the internet compared to 17% in rural areas[85]. In addition to gender and socio-economic variances, mobile phone ownership and usage is said to be dependent upon the level of education and literacy of individuals.[86]

The Kenyan digital ecosystem boasts a range of technological innovations across various sectors.[87] The most notable being the establishment of M-PESA (Pesa is Swahili for "money"), the country's first mobile money service, which was developed by Kenya's largest mobile network provider, Safaricom.[88] Launched in 2007, M-PESA completely revolutionized the financial sector and made financial inclusion a reality for many who had little to no access to the more traditional means of banking. Now woven into Kenya's entire economic landscape, M-PESA has inspired 42 million people to become active users.[89]

Another laudable innovation occurred in 2014, when the government launched 'e-citizen', a government-to-citizen platform, which allows citizens to apply for government services from drivers licenses to business registration certificates.[90] E-citizen pioneered the concept of providing cross-agency, citizen-centric information and services, to help Kenyan citizens complete transactions expeditiously.

Over the last three years, the government has also launched the National Integrated Identity Management System (NIIMS), dubbed 'Huduma Namba', a single source of personal information through a unique identification number for all Kenyans and foreign residents.[91]

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[83] 2019 Kenya Population and Housing Census Volume IV: Distribution of Population by Socio-Economic Characteristics, pg 12 Available from: https://www.knbs.or.ke/?wpdmpro=2019-kenya-population-and-housing-census-volume-iv-distribution-of-population-by-socio-economic-characteristics

[84] Data reportal, Digital 2021: Kenya, Available from:https://datareportal.com/reports/digital-2021-kenya

[85] Kenya Digital Economy Assessment (World Bank 2019) pg 19 Available from:https://thedocs.worldbank.org/en/doc/345341601590631958-0090022020/original/DE4AKenyasummarypaperfinal.pdf

[86] Martin Njoroge et al, ' Assessing the feasibility of eHealth and mHealth: a systematic review and analysis of initiatives implemented in Kenya' BMC Res Notes, 10:90;2017 Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5301342/

[87] Lena Nitsche (January 2019), 'Exploring initiatives and projects from Kenya's digital ecosystem' Available from: https://www.dw.com/en/exploring-initiatives-and-projects-from-kenyas-digital-ecosystem/a-47135019

[88] Safaricom Website, Available from: https://www.safaricom.co.ke/m-pesa

[89] Kelsey Piper, 'What Kenya can teach its neighbours-and the US- about improving the lives of the unbanked', September 2020 Available from: https://www.vox.com/future-perfect/21420357/kenya-mobile-banking-unbanked-cellphone-money

[90] e-Citizen website, Available from: https://www.ecitizen.go.ke

[91] Huduma Namba Website, Available from: https://www.hudumanamba.go.ke

Kenya has promoted biometric registration of indigents into the Universal Health Coverage Scheme; and established 'Ardhisasa', a digital land resource management platform.[92] Kenya has undeniably made strides towards an e-government, though this transition has been met with opposition from civil society due to the absence of laws and regulations aimed at protecting citizens' privacy rights and deficient public participation practices. This push back resulted in the High Court suspending the "Huduma Numba" system pending development of a legislative and regulatory framework.[93]

4.2   NATIONAL LAWS AND POLICIES ON DIGITAL HEALTH

The legal and policy framework on digital health in Kenya is currently fragmented. All applicable laws and policies stem from the Constitution of Kenya 2010, more specifically, Chapter 4 of the Constitution which provides the Bill of Rights.[94] The right to health is guaranteed under Article 43(1)(a) of the Constitution which states that "*every person has the right to the highest attainable standard of health, which includes the right to health care services, including reproductive health care*". Article 31(c) and (d) of the Constitution touch on the right to privacy by establishing provisions for the processing of personal data and are key governing provisions particularly where data-driven technologies are being implemented.

The following regulations, policies, and strategies are relevant to health governance in Kenya and for this project:

- *Health Act, 2017*
- *Kenya Health Policy (2014-2030)*
- *Kenya AIDS Strategic Framework II 2020/21-2024/25*
- *National Strategic Plan for Tuberculosis, Leprosy and Lung Health 2019-2023*
- *National Gender and Equality Commission (NGEC) Strategic Plan 2019-2024*

In addition, these policies and standards guide development of digital health in particular:

- *Kenya National eHealth Policy 2016-2030*
- *Kenya Standards and Guidelines for mHealth Systems (2017)*
- *Health Information Policy (2014- 2030)*
- *Health Sector ICT Standards and Guidelines, 2013*

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[92] Gilbert Koech, Kevin Cheruiyot, 'Nairobi land transactions go digital as Uhuru launches online platform', Available from: https://www.the-star.co.ke/news/2021-04-27-photos-nairobi-land-transactions-go-digital-as-uhuru-launches-online-platform/

[93] Cullen, D (2020). "High Court of Kenya suspends implementation of biometric ID system". *Oxford Human Rights Hub.* Retrieved from: https://ohrh.law.ox.ac.uk/high-court-of-kenya-suspends-implementation-of-biometric-id-system/ (Accessed 5 June 2021).

[94] The Constitution of Kenya, 2010,Available from: http://kenyalaw.org/kl/index.php?id=398

These are complemented by a core framework governing digital technologies:

- *The Data Protection Act, 2019*
- *Kenya Information and Communications Act,1998*
- *The Science, Technology and Innovation Act, 2013*
- *Computer Misuse and Cybercrimes Act, 2018*
- *ICT Policy 2019*

In Kenya, the term eHealth is synonymous with digital health. The *Health Act* defines 'eHealth' as the combined use of electronic communication and information technology in the health sector including telemedicine.[95] The Act tasks the Cabinet Secretary for Health with the enactment of legislation that provides for, among other things, the collection and use of personal health information; protection of privacy; health service delivery through mHealth; e-learning and telemedicine; e-waste disposal; and health tourism. Thus far, though an eHealth unit has been established within the Ministry of Health, little progress has been made towards the enactment of this 'e-legislation'; consequently, regulatory gaps are filled by other laws and policies.

In support of the growing eHealth projects in Kenya, the Ministry of Health introduced the first *National eHealth Strategy* in 2011.[96] The strategy noted that the country's healthcare infrastructure suffers from urban-rural and regional imbalances, lack of investment, and a rising cost and demand for quality healthcare services against the backdrop of poor human resource capacity, and aims to address these gaps through eHealth. The strategy also outlines five specific strategic areas of focus to aid eHealth project implementation in the country. These include telemedicine, health information systems (including electronic health records), mHealth, eLearning (including distance education or learning), and health information for citizens.

In 2016, the Kenya *National eHealth Policy,* anchored in the *Kenya Health Policy 2014-2030* was enacted.[97] One of its priorities is to plan, design, and install ICT infrastructure and software for the management and delivery of essential healthcare. The National eHealth Policy aims to improve the availability and quality of healthcare services through the use of ICTs by enhancing interactions between client and health service providers; accelerating the achievement of universal health coverage; and enhancing electronic exchange of health data and information.[98]

As stated above, Kenya lacks a comprehensive legal framework conducive for the adoption and utilization of eHealth throughout the country. It relies instead on diverse standards, laws, and

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[95] Health Act, 2017, Available from:
http://www.kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=No.%2021%20of%202017
[96] Kenya National e-Health Strategy 2011-2017, Available from:
http://publications.universalhealth2030.org/uploads/kenyanation_ehealth_strategy.pdf
[97] Kenya National e-Health Policy 2016-2030, Available from: kenya national ehealth policy; and Kenya Health Policy 2014-2030 Available from:
http://publications.universalhealth2030.org/uploads/kenya_health_policy_2014_to_2030.pdf
[98] Kenya National e-Health Policy 2016-2030

policies which apply to eHealth but do not extensively discuss it, thus creating gaps in the regulatory and enforcement system.[99] Guidelines on implementation are set out in six principles targeted towards the execution of a *Kenya National eHealth Policy* that is user-centric, focused, and informs healthcare investment decisions. These guiding principles are further supplemented by policy orientations, which highlight priority areas for investments towards implementation. Ensuring equitable quality healthcare services through the adoption of ICTs is considered one of the areas of investment, and is acknowledged as a way to reach vulnerable population groups, especially those in low resource settings.

The policy asserts that the country's eHealth evolution is lagging due to social, economic, and technical challenges, such as the high cost of eHealth systems and innovations; low ICT literacy amongst users; lack of interoperability of eHealth systems; market fragmentation; and a weak regulatory framework. The national and county government institutions mandated to implement the policy were meant to form a technical working group to oversee implementation, though no information is available on the working group's existence or activities.

To manage the increased demand for mHealth, the Ministry of Health developed the *Kenya mHealth Standards and Guidelines*, which clearly define applicable requirements for the proper development and implementation of mHealth systems, applications, and interventions including legal and ethical obligations.[100] These standards were also developed to avoid duplication of mHealth initiatives, promote information-sharing, and move the mHealth sector from silo-based pilot phases to scalable, fully operational interoperable solutions.

In addition to the mHealth and eHealth strategies and policies outlined above, several national strategies are of relevance for this project, more specifically, the *Kenya AIDS Strategic Framework II 2020/21-2024/25* and the *National Strategic Plan for Tuberculosis, Leprosy and Lung Health 2019-2023.* [101] Both strategic plans address the importance of safeguarding the human rights of marginalized groups, persons at a heightened risk of infection, and those at-risk of rights violations, but only make reference to the use of preventive and diagnostic machinery. Kenya's National Gender and Equality Commission (NGEC) *Strategic Plan 2019-2024* is implemented by NGEC, a constitutional commission mandated to promote and ensure gender equality and non-discrimination in the country.[102] This strategic plan briefly acknowledges the opportunities and challenges social media platforms and technology present with respect to

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[99] Report of Technical Working Group to Develop Guidelines and Checklists for Report on the Regulation of Electronic Health Practice in the Country, 2019, https://kmpdc.go.ke/resources/4.%20Draft%200%20-%20Electronic%20Health%20Regulation.pdf

[100] Kenya Standards and Guidelines for mHealth Systems, 2017 Available from: https://www.health.go.ke/wp-content/uploads/2020/02/Revised-Guidelines-For-Mhealth-Systems-May-Version.pdf

[101] Kenya AIDS Strategic Framework II 2020/21-2024/25, Available from: https://nacc.or.ke/kenya-aids-strategic-framework-kasf/ ; National Strategic Plan for Tuberculosis, Leprosy and Lung Health 2019-2023, Available from:https://www.nltp.co.ke/download/national-strategic-plan-2019-2023/

[102] National Gender and Equality Commission (NGEC) Strategic Plan 2019-2024 Available from:https://www.ngeckenya.org/Downloads/NGEC-Strategic-Plan-2019-2024.pdf

improving the effective delivery of its mandate, though it does not address specifics. It also speaks of its overall alignment to the Bill of Rights enshrined in the Constitution of Kenya, 2010 with a specific focus on the rights of women, youth, persons with disabilities, children, older members of society, minorities, and marginalized groups.

All of the above strategies, policies, and guidelines specific to health are complemented by the *ICT Policy 2019,* which provides a clear vision to drive social, economic, cultural, and political transformation through the effective use of ICTs. The creation of an enabling environment for the development of eHealth solutions is dependent upon policies such as this and other legislation, such as the *2013 Science, Technology and Innovation Act* to develop needed infrastructure and access.[103]

Data protection is upheld by the *2019 Data Protection Act*, a critical issue for everyone and in particular for people living with HIV and TB, and key populations. Before 2019, Kenya had no data protection laws. The Act established the office of the Data Protection Commissioner, mandated to oversee the implementation and enforcement of the Act.[104]

4.3   DIGITAL HEALTH STRATEGY AND IMPLEMENTATION ANALYSIS

In 2013, Kenyan researchers mapped 70 eHealth projects across the Nairobi, Kisumu, and Mombasa counties.[105] Nationally, progress in eHealth implementation is slow though mHealth interventions appear to be proliferating. The eHealth solutions mapped in the study shared common aims: enhancing data management, training healthcare workers, improving diagnosis, and promoting healthy behavior particularly with regard to primary care, HIV/AIDS, and maternal, newborn, and child health. However, researchers found that the lack of government buy-in and funding meant that several donor-funded innovations were not aligned to national priorities and were abandoned in their infancy. Factors that affect the successful implementation of eHealth systems include the quality of eHealth systems, macro-political environment, online safety and security, e-standards, systems integration, ICT competence, and the legal environment, among others.[106] Telemedicine, for example, is at an early stage of development. Although it is partly

[103] The Science, Technology and Innovation Act 2013, Available from:http://www.kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=No.%2028%20of%202013
[104] Data Protection Act, 2019, Available from:http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/2019/TheDataProtectionAct__No24of2019.pdf
[105] International Development Research Centre (IDRC), January 2018, 'Developing eHealth policies for greater equity in Kenya,' Available from: https://www.idrc.ca/en/research-in-action/developing-ehealth-policies-greater-equity-kenya
[106] Caroline Boore (2018),' A framework for E-Health Implementation in the Health Care Sector in Kenya: A Grounded Theory Approach,pg 184 Available from: http://erepository.uonbi.ac.ke/bitstream/handle/11295/104378/Boore%2C%20Caroline.pdf?sequence=2%26isAllowed=y

regulated by existing laws, Kenya lacks uniform standards to regulate issues such as informed consent in telemedicine.[107]

Collaboration between tech developers and the government is limited. This is slowly changing, albeit more at the national rather than county level.[108] Absent a centralized national registry, it is difficult to assess how many eHealth projects are being implemented at any given time. A 2017 study which sought to analyze mHealth and eHealth initiatives in Kenya found that mHealth primarily focused on primary care and HIV/AIDS.[109] It also found few projects were implemented in marginalised areas and least urbanized counties, undermining equity. For example, compared to Nairobi city with a total number of 24 eHealth projects, least urbanized counties such as Turukana, Wajir, and Garissa had only one or two eHealth projects being implemented.[110]

Results from a study aimed at establishing the factors that promote the adoption of mHealth and determine operational challenges in mHealth applications found that i) the presence of telecommunication infrastructure facilitated adoption of mobile based solutions; ii) only 25% of the respondents had used any form of mHealth applications before; and iii) 94.1% of the respondents believed that mHealth would complement the traditional healthcare system and improve their maternal healthcare knowledge.[111] The target population consisted of medical doctors, nurses, and medical staff, as well as pregnant women and mothers or fathers of children under 3 years old, as the application under review was designed to provide antenatal and postnatal healthcare information. Further, around 94.1% of the study participants believed that their data was private and confidential, thus security concerns were not viewed as an operational challenge.[112]

Overall, knowledge of data rights in Kenya is poor. An opinion poll by Amnesty International Kenya and the Open Institute, surveying 1,521 respondents from across 30 counties, found that just 54% of Kenyans were aware of their right to privacy, 67% did not know the Data Protection

[107] Margaret Zalo (August 2020),'The Emerging Practice of Telemedicine and the Law: Kenya's Stance' Available from: https://cipit.strathmore.edu/the-emerging-practice-of-telemedicine-and-the-law-kenyas-stance/
[108] mHealth Kenya https://www.mhealthkenya.org/covid-19
[109] Martin Njoroge et al,' Assessing the feasibility of eHealth and mHealth: a systematic review and analysis of initiatives implemented in Kenya', BMC Research Notes, 90(2017) Available from: https://bmcresnotes.biomedcentral.com/articles/10.1186/s13104-017-2416-0
[110] Martin Njoroge et al,' Assessing the feasibility of eHealth and mHealth: a systematic review and analysis of initiatives implemented in Kenya', BMC Research Notes, 90(2017) Available from: https://bmcresnotes.biomedcentral.com/articles/10.1186/s13104-017-2416-0
[111] Eric Kariuki (2016) ,'Adoption of M-Health and Usability Challenges in M-Health Applications in Kenya: Case of Uzazi Poa M-Health Prototype Application', pg 81 Available from: http://erepo.usiu.ac.ke/bitstream/handle/11732/2875/ERIC%20GACHERU%20KARIUKI.pdf?sequence=1&isAllowed=y
[112] Eric Kariuki (2016) ,'Adoption of M-Health and Usability Challenges in M-Health Applications in Kenya: Case of Uzazi Poa M-Health Prototype Application', pg 71 Available from: http://erepo.usiu.ac.ke/bitstream/handle/11732/2875/ERIC%20GACHERU%20KARIUKI.pdf?sequence=1&isAllowed=y

Act of 2019 existed, and 82% were unaware of the Office of the Data Protection Commissioner.[113] Awareness of the right to privacy was found to be higher in urban areas (56%) than rural areas (41%). More information on the privacy concerns and priorities of different population groups is needed for a better understanding of what constitutes 'awareness of the right to privacy' in the country.

Digital literacy is a key component to determining whether one's right to privacy is being upheld or not and to what extent. In 2018, youth literacy in Kenya stood at 87.8%, that is, the percentage of people aged 15-24 years old in Kenya that are able to read and write a simple statement. This varied with respect to gender, where for the first time women recorded having greater literacy levels (88.1%) than their male counterparts (87.6%)[114]. Digital literacy levels in Kenya are yet to be recorded, though the country is making strides towards more digital inclusivity through initiatives such as the digital literacy programme, with ICT devices being distributed to public primary schools across the country[115].

The Digital Health and Rights project can contribute to advocacy for greater awareness of privacy concerns of people living with and affected by HIV and TB as well as key populations, and ensuring greater awareness of the Act and related reporting mechanisms.

In light of the above findings, Kenyans are not opposed to using mobile health applications and in fact believe they would benefit from their usage. It is also evident that ICT infrastructure is vital to the implementation of both eHealth and mHealth solutions. The existence of the *National Broadband Strategy 2018-2023* among other ICT policies and strategies is confirmation of the country's commitment to facilitate the use of digital health technologies.[116]

The institutions and agencies mandated to govern the digital health sector in Kenya include national and county level actors. The Ministry of Health and the Ministry of ICT are the principal regulatory authorities responsible: the former for initiating and coordinating eHealth development, implementation, evaluation and review; and the latter for monitoring and evaluation of organizational compliance with standards and guidelines for eHealth infrastructure, device specification, and software.

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[113] Still Unaware: The State of Awareness on Data Protection in Kenya, Available from: https://www.amnestykenya.org/wp-content/uploads/2021/05/State-of-Awareness-Opinion-Poll.pdf
[114] Youth Literacy rate in Kenya from 2010 to 2018, Statista, Available from: https://www.statista.com/statistics/1233548/youth-literacy-rate-in-kenya-by-gender/
[115] ITU News (2018),' Bringing the digital revolution to all primary schools in Kenya' Available from: https://www.itu.int/en/myitu/News/2020/05/29/09/24/Bringing-the-digital-revolution-to-all-primary-schools-in-Kenya
[116] National Broadband Strategy 2018-2023 Available from: https://www.ict.go.ke/wp-content/uploads/2019/05/National-Broadband-Strategy-2023-FINAL.pdf

New digital tools and products are entering the market all the time, but regulatory systems have not kept up with the influx of technologies. Therefore, the country needs a more comprehensive legal framework and more enabling infrastructure.

4.4   DIGITAL HEALTH INTERVENTIONS

Digital health solutions are advancing rapidly in Kenya.

Leading mobile network Safaricom, in partnership with the Nakuru County Government, has developed Afya Moja, a mobile-based digital health passport that receives and securely stores patient information.[117] It has made patients' medical records portable, and users can now access a copy of their health information to share with healthcare providers. To assist Kenyans in meeting healthcare costs, M-TIBA, another Safaricom venture, enables users to set funds aside to pay for healthcare expenses. The funds stored in M-TIBA can only be used for healthcare services and medication at healthcare facilities that carry their logo.[118]

The country has also adopted the term 'pharmatechs' (pharmaceutical technologists), pharmacists who deliver medication directly to the patient's doorstep. MYDAWA is the first registered online pharmacy in Kenya.[119] Another service delivery application in use is Capsule, a platform that provides an on-demand ambulance booking service.[120]

Since the onset of the coronavirus pandemic, health solutions have been developed to not only monitor and prevent the spread of the virus, but to cater to those that do not have access to healthcare facilities either due to curfew restrictions, hospital congestion, or geographical constraints, for example. As a result, mobile applications such as TeleAfya, an application that connects patients to doctors for medical services, experienced a more than 100% spike in downloads during the pandemic.[121] By June 2020, the app hosted 200 medical providers and more than 500 patients.

According to a report on mobile health transformation in Kenya, 37% of the people surveyed were using mobiles to access healthcare and 93% of them reported an improvement in their healthcare experience.[122]   Though Kenya appears to have a vibrant digital health landscape, it is unclear

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[117] Tech-ish. com, (April 2021) Safaricom rolls out pilot for Afya Moja, a Digital Health Passport,Available from: https://tech-ish.com/2021/04/14/safaricom-rolls-out-pilot-for-afya-moja-a-digital-health-passport/

[118] M-TIBA, Available from: https://mtiba.com

[119] MYDAWA Available from: https://mydawa.com/

[120] Capsule, Available from: https://tracxn.com/explore/HealthTech-Startups-in-Kenya

[121] John Muchangi (September 2020) ,' Pandemic boon for digital health services, The Star, https://tracxn.com/explore/HealthTech-Startups-in-Kenya

[122] Margaret Njugunah, (February 2021) ' Covid-19 Driving Digitization of Healthcare in Kenya Report, Capital Business, Available from: https://www.capitalfm.co.ke/business/2021/02/covid-19-driving-digitization-of-healthcare-in-kenya-report/

whether this translates into transformative healthcare outcomes or toward meeting national health goals.

Relevant to the project, the following interventions have been identified in Kenya:

- **SRHR:** Sophie Bot[123] Sophie is a smart chat robot that is fed with verified information on sexual and reproductive health and relays the information to its users through conversations that are driven by text or voice chats. Like Siri, users can ask Sophie questions and she uses artificial intelligence to respond, either by voice or text.

- **SRHR:** Lily Health[124] is an interactive mobile chat that builds a personal relationship with each user and provides women with sexual and reproductive health advice via mobile messaging.

- **SRHR:** Totohealth[125] uses mobile technology to help reduce maternal mortality and child mortality and detect developmental abnormalities in early stages. Totohealth enables mothers and fathers to receive targeted and personalized messages timed to their child's age or to the mother's stage of pregnancy. These messages are able to highlight any warning signs, and equip users with knowledge on nutrition, reproductive health, parenting, and developmental stimulation.

- **COVID-19**: Jitenge[126] (Swahili for self-isolate) is an mHealth technology developed by mHealth Kenya to support the Government in the fight against COVID-19 in Kenya. The system is used to manage and monitor home based care management, self-quarantine for contacts, post isolation follow-up, and monitoring long distance drivers. Registered users receive prompts to report on their health status.

4.5   ANALYSIS

Digital health appears to be booming in Kenya, but overall awareness of the new Data Protection Act is not widespread. Given the proliferation of SRH technologies, the research project might usefully focus on privacy and data protection for young women living with and vulnerable to HIV when accessing information and services on SRH. The ongoing debates and litigation over

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[123] Sophie Bot, Available from: https://www.f6s.com/sophiebot or
https://play.google.com/store/apps/details?id=com.amusoft.sophiebot&hl=en&gl=US
[124] Lily Health https://lily.health
[125] Totohealth https://totohealth.org/aboutus
[126] mHealth https://www.mhealthkenya.org/covid-19 or
https://play.google.com/store/apps/details?id=com.mhealthkenya.dm.mohkenya&hl=en&gl=US

regulation of digital identities, as well as advocacy around freedom of expression and online content moderation, could create a diverse base of allies for advocacy and work to strengthen policy and law for digital health in Kenya.

5. REFLECTIONS AND CONCLUSIONS

Ghana, Vietnam, and Kenya have significant differences, including cultural, ethnic, political, and linguistic diversity, and each country is also complex as different regions have different needs and resources. Each country is also at a slightly different stage in the digital transformation: while Ghana was an early adopter of the internet, access to digital technologies seems at a relatively early stage compared to Kenya (where we see a proliferation of digital health tools) and Vietnam (where digitization is advanced, but digital health seems to be developing more slowly).

In considering access and uptake of digital health for young adults, especially considering socio-economic and other forms of inequality (particularly for women, people living with or affected by HIV and TB, and young key populations), the project can make a contribution to the field by exploring how diverse forms of marginalization shape access to digital technologies and the internet in each country, and are relative to the general population in each country. It is possible that young adults may have quite different levels of sophistication in regard to digital technologies in each country, but also possible that they may share some common experiences of digital marginalization transnationally.

While each country has begun to put in place strategies and policies to better coordinate digital health, digital governance is at an early stage of development in all three countries. None of the strategy or policy frameworks reviewed for this project robustly addressed marginalization, gender, or other forms of inequality that could significantly affect implementation. This project may be able to suggest specific considerations and policy strategies for health and ICT officials to consider in rolling out their strategies in order to ensure equitable access to digital health, including for those offline, and to address the digital gender divide.

Considering the security and privacy risks for recipients of healthcare, transparency of digital health governance will be crucial to improve digital literacy for young adults. While each country has a relatively young population, and young people are seen as a significant force shaping future digital trends in each country, none of the three countries seem to have a clear role and voice for civil society and communities affected by HIV and TB in digital health governance. Moreover, levels of data and digital literacy among young adults in all three countries appear relatively low.

Through interviews and consultation with young adults in Ghana, Vietnam, and Kenya, this project can help to identify concrete actions to take to improve digital literacy and empower young adults to have a voice in future design and governance of digital health.