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Introduction

Access to modern technology in rural areas

Digital Divide refers to the disparity between individuals who possess access to contemporary information and communication technologies and those who lack such access. This distinction bears significant consequences for healthcare, particularly regarding accessibility and quality of care. Health disparities frequently arise from variations in healthcare infrastructures, especially within underdeveloped communities. In Nigeria, there is poor internet connectivity due to power supply instability in rural areas, leading to exacerbating healthcare disparities after the digital divide had emerged. According to research from Telehealth and Medicine Today, 76.4% of respondents expressed their inability to afford digital healthcare in Nigeria. Digital engagement has the potential to profoundly affect socioeconomic factors in terms of health, like education and employment, affecting the people and society as a whole. The most digitally divided and affected in the population are those with chronic diseases, people living with disabilities, people from low-income earning families, and people with low literacy and educational levels. In this view, the relation between the populations most vulnerable to health inequities, which is the unfair and avoidable differences in health across the population and between different groups within society, and the digitally excluded certainly points out how huge of a role the digital divide plays in perpetuating existing inequalities.

It is crucial to close these gaps given the speed with which health services are becoming digitalized. Digital enablement, a strategic integration of digital technologies into various aspects of the business, has a direct and indirect impact on health outcomes. Having the equipment, connectivity, skills, motivation, and support needed to navigate the internet and use digital services defines digital

enablement. Indeed, this includes a patient's ability to use digital platforms for communication with medical professionals as well as accessing reliable information about healthcare literacy. Therefore, it is necessary to effectively evaluate the digital disparity and healthcare accessibility gaps so as to discover contemporary challenges behind them.

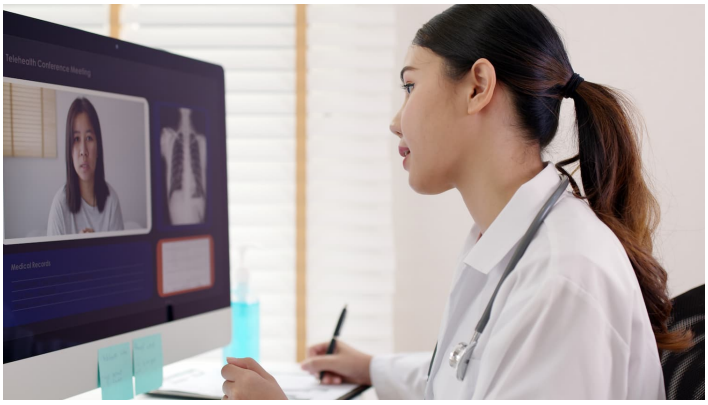
Background

Initially, some countries implemented programs that enabled patients to reach healthcare professionals without visiting their houses or hospitals through telecommunications. Nevertheless, the entrance was not equitable with respect to low-income regions which experienced a lack of both technical literacy and necessary equipment. The second half of the 2010s saw significant investments in health information technology and electronic health record (EHR) implementation. Governments have introduced EHR systems and mobile health apps, which have been heavily used to narrow health gaps by enabling healthcare providers and patients to communicate over long distances, monitoring the current conditions of the patient, and managing any chronic conditions effectively. Despite the potential benefits of EHRs, the implementation faces barriers and restrictions such as cost constraints, technical limitations, standardization limitations, and organizational constraints. Specifically, as they contain specific information about the patients such as their names, addresses, tests, diagnoses, treatment, and medical history, there is an urgent need to protect and ensure that the information does not leak out for manipulation from others.

Connection with healthcare and digital devices

Despite these steps forward, disparities remained extensive with many rural areas lacking the infrastructure necessary to make use of such systems. New studies demonstrate that telehealth may not be capable of significantly reducing healthcare inequalities. In fact, globally, the expansion of telehealth coverage has made some underlying health inequities even worse especially during the COVID-19 pandemic. Healthcare systems all over the world have had to rapidly adopt telehealth technologies in response to the pandemic so as to continue providing care while minimizing in-person contact. The COVID-19 pandemic has also brought into focus potential benefits related to digital medicine, including improved data control and the introduction of new medicine. Such a shift has made access more possible but it has also brought about greater evidence of inequality that already existed before. Some vulnerable

populations like older people or those from poorer backgrounds frequently do not have what it takes to maximally utilize any advances within digital healthcare technology because they lack the necessary resources required.



Virtual counseling to combat COVID-19

Virtual counseling became the new norm because there was an immediate need to cut off physical contact and reduce the chances of infections spreading. Primary and secondary care professionals were not seen much, and the majority of those professionals went in charge through telephonic calls or video conferencing. The more people became nervous about catching the virus, the more they kept their distance from hospitals. This shift towards digital healthcare services and infrastructures and the resulting severe consequences imply that addressing the root causes of inequalities in healthcare is much more complex than merely increasing access to digital health services.

Problems Raised

Global Disparities

The digital divide in healthcare is evident in both technology accessibility and its efficient utilization. Even when technology is present, individuals may not have the capacity to use digital health tools or understand the information that they contain. For example, only 1 in 2 countries in Europe and Central Asia have policies to improve digital health literacy, leaving millions behind. Disparities vary considerably across regions: while high-income countries have well-established digital infrastructures and solutions for health technology, low-income and some middle-income countries face basic connectivity challenges and limited access to technology. For example, e-health initiatives were introduced in sub-Saharan Africa, but overall access and health infrastructure are inadequate. Also, 81% of the people in Central Asia said that they were unsatisfied with internet access for the price paid, compared to 27% of the people in Europe.

Furthermore, it can be different even between what seems similar groups like the aged and persons with disabilities. These differences within a population can be attributed to factors such as personal circumstances, level of education, and socioeconomic status. For instance, compared to young adults, older adults may be unfamiliar with telehealth services and struggle to keep up with the changing technology. Therefore, there are significant disparities in access to healthcare resources, leading to being

more susceptible to various diseases and health issues. Traditional data collection methods may fail to capture subtle differences in digital inclusion making it hard to target treatments effectively. Therefore, an in-depth examination of the digital divide so as to pinpoint specific vulnerable areas within healthcare infrastructures is required.

Lack of access to healthcare infrastructures

Lack of Comprehensive Data

Thorough information is lacking on the healthcare necessities, not accurately representing some individuals within the country and resulting in an incomplete picture of the assessment of the digital divide and access disparities in healthcare infrastructures. Moreover, the lack of uniform evaluation methods and criteria for measuring digital exclusion hinders the development of a reliable understanding of the digital divide when assessing the data. Many of the present-day data may lack relevance to today's policymaking and actions because technology changes fast as well as user behavior, and access patterns in the digital world. There is a lack of standards based on research, privacy concerns, problems with data governance, and ethical dilemmas. The sensitivity of health data is a significant problem that, when digitized, may give rise to privacy problems. The issue of permission raises further ethical concerns because many users might not completely comprehend the terms of use before agreeing to them. This lack of comprehensive data due to various circumstances results when the assessment of the digital divide in healthcare is not effectively measured. Ineffective measurement of digital healthcare accessibility can lead to misleading conclusions about where urgent assistance is needed. This can lead to encouraging changes in chronic disease management and response to mental health prematurely, engendering a paradox by ignoring the needs of the actual vulnerable individuals. In the absence of proper information or data accuracy, it is highly likely to result in unsuccessful use of resources where those that need management will remain unmanaged.

International Actions

Global Strategy on Digital Health 2020-2025

The Global Strategy on Digital Health 2020-2025 was developed by WHO, setting out a plan for global equitable advancement in digital health that is coordinated. This approach intends to "ensure equitable access to digital health services, especially for underserved populations." It calls for the establishment of uniform metrics and procedures for assessing readiness, access, and utilization with special attention paid to detecting and remedying imbalances. It also emphasizes the importance of "no one left behind" approach to digital health innovation that serves people in every part and sub-part or remotest rural areas. The strategy advocates for customized digital healthcare solutions that provide different populations with their unique needs and settings. In addition, progress monitoring and evaluation ensure accountability and continuous improvement toward bridging the digital divide and addressing inequitable access to healthcare infrastructures.

World Health Assembly Conference in United Nations

The Digital Transformation Strategy for Africa (2020-2030)

The Digital Transformation Strategy of the African Union is a 10-year blueprint designed to guide Africa's digitization between 2020-2030. It aims at leveraging technology for social change, economic growth as well as unity of Africans through addressing the digital gap as well as enhancing accessibility of digital healthcare infrastructure. Overall, it aims for all Africans to have access to affordable reliable digital infrastructure including internet access by 2030. The plan has systems for monitoring development and determining the achievements of initiatives in digital transformation. Ongoing evaluation will assist in identifying gaps in the availability of digital health services and modifying policies and programs to better address these inequities. This is done so that this technique can continue to be adaptable to the changing needs of African communities.

Key Players

World Health Organization (WHO)

World Health Organization

WHO was established on April 7, 1948, as a specialized agency of the United Nations with a mandate to foster global public health and is governed by the World Health Assembly. WHO plays an important role by providing technical health assistance to developing countries and coordinating international responses to disease outbreaks, and have a significant impact on the public and government. WHO provides leadership, guidance, and support to member states thereby playing a critical role in bridging the digital divide as well as access inequities in healthcare infrastructures. Specifically, to make sure that digital technologies are available to all, especially the poor areas, WHO calls for its inclusion in national health policies through initiatives such as the Global Strategy on Digital Health 2020–2025. In addition, WHO also develops global norms and guidance for digital health to assist countries in developing safe, efficient, and inclusive digital health systems that will address inequities in health care outcomes and access.

International Telecommunication Union (ITU)

To attain universal access to information and communication technology (ICT), the International Telecommunication Union (ITU), a United Nations specialized agency established on 17 May 1865, is playing a leading role worldwide in coordinating international efforts. They gather detailed data on ICT development and access useful in identifying and quantifying digital inequalities and create conceptual frameworks as well as procedures for monitoring and assessing the digital divide including but not limited to the Digital Development Index (DDI) and ICT Development Index (IDI). To achieve this universal coverage of health care, they note that the digital divide especially for internet accessibility and e-health services should be given priority with increased funding and targeted interventions aimed at ensuring equitable access to digital health technologies more so among marginalized communities. For example, ITU initiated the Giga project, which intends to provide internet connectivity to all schools by 2030, so indirectly facilitating access to digital health.

Possible Solutions

Identification of Gaps, Locations, and Roots of the Issue

In order to guarantee equal distribution of digital healthcare services and minimize healthcare disparities, local governments, legislators, civil society organizations and non-governmental organizations (NGOs) must acknowledge the gaps, locations as well as underlying roots of the disparity. Gaps can be a result of insufficient funding for digital literacy and internet infrastructure. To access healthcare remotely, there is a need for at least 10 Mbps of usable internet. Across the globe, there are various areas where evidence of digital divide exists, such as places with no access to digital devices, lack of connectivity or infrastructure, and illiteracy in technology. Additionally, political boundaries, geo coordinates, or addresses could also be various ways to measure and discover the exact location. Stakeholders should develop specialized and effective measures aimed at bridging the gap and improving everyone's accessibility to healthcare. For instance, countries began to use EHRs to help gain more value from the use of these tools when improving data collection. AI takes this one step further by enabling providers to take advantage of information within the EHR and data pulled from outside of it. Nonetheless, while collecting data, privacy concerns must be prioritized. Furthermore, the implementation of a community-based survey helps to serve as a guide to learn about and understand the digital divide present in that specific community. It can assist local authorities in better understanding how people interact with technology and they can prioritize these as part of a community solution by using it to identify specific actions to close gaps.

Standardized Guidelines through Collaboration of International Organizations

Access to digital health information

United Nations can work together with governments of member states in order to establish common terminologies and frameworks where various countries can come up with guidelines for assessing the digital divide and access disparities in healthcare infrastructures on a standardized basis. Despite differences in specific aspects of the policies across authorities, these frameworks should share such values as autonomy, beneficence, justice, and privacy. In addition, such frameworks must be under constant observation and change to keep the guidelines current, especially with the government keeping in place legal requirements and standards for developers of new technology. Through effective and accurate assessment of the digital divide and

access disparities in healthcare infrastructures globally, countries would be able to better understand and comprehend the problems faced with digital healthcare and be able to potentially develop methods to overcome the problem.

Glossary

Digital Divide

The digital divide is the disparity between those who use and have access to digital literacy, internet devices, and Internet connectivity compared to others who do not. Various aspects of people's lives, including their abilities, gender identity, age difference, ethnic background, or poverty level are influenced by this digital gap. This relates to disparities in the availability of digital health resources that could affect health outcomes like telemedicine, electronic medical records (EMR), healthcare apps, and internet connectivity.

Access Disparities

Access Disparities are the differences in accessibility and quality of healthcare services among different populations often due to variables such as age, disability status, geography (rural and urban), income levels, or race and ethnicity. It refers to the ability of people to have access to health facilities such as hospitals or clinics, physicians or any other form of medical personnel, medical support systems, or online information regarding health.

Health Infrastructure

Health infrastructures are physical organizational frameworks necessary for running healthcare facilities such as clinics, hospitals, health information networks, and personnel. It can also include e-health record systems, high-speed internet, telehealth platforms, and digital literacy of patients and healthcare professionals from the perspective of digital health infrastructure.

Telemedicine

Telemedicine is an innovative approach to medical care that utilizes network services and technology. Online conferencing allows healthcare professionals and patients from different regions to access distant healthcare services. This is a current approach to successfully solving the various problems related to healthcare.

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