

Critical Analysis of Innovations in Healthcare Systems, Public Engagement, and Global Health Equity

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Abstract

Healthcare organizations globally are increasing operating system changes due to advancing technology, changes in consumers' demands, and initiatives to enhance equity. In the following paper, the author critically discusses innovations in the health sectors, public participation, and the fight for health equity across the globe. Major innovations identified include telehealth, artificial intelligence, and precision medicine; major issues discussed are unequal distribution and ethical concerns. Possible approaches to engaging the public in system changes in healthcare and how to address disparities in global health access are also examined.

Keywords-Healthcare innovations, public engagement, global health equity, telehealth, artificial intelligence, health disparities, policy reforms.

Introduction

Healthcare systems, as we all know, form a core part of every society, but they are not without challenges that include but are limited to; Leadership, Resource & Facility Management, Staffing & Development, Financing, Technology, and Availability & equity. Consequently, advancements like telemedicine, informatics-based diagnosis, and precision healthcare have reflected themselves in the services. Nevertheless, applying these innovations in all spheres of people's lives in various countries is challenging owing to the differences in infrastructure, financial conditions, and educational levels. Citizens' participation has become a key determiner of healthcare reforms' relevance to society and continuing health inequality across nations as a moral and pragmatic challenge. The following three domains are considered in this

paper: the present state of research, challenges, and potential developments.

Literature Review

Innovations in Healthcare Systems

Concepts of Improvement in Healthcare Delivery

The healthcare field is on the brink of significant change, with changes to the structure and process of care delivery through technology and policy and the utilization of new patient-centred approaches. These changes are used when dealing with intricate health issues, increase capacity, and lead to better patient care management.

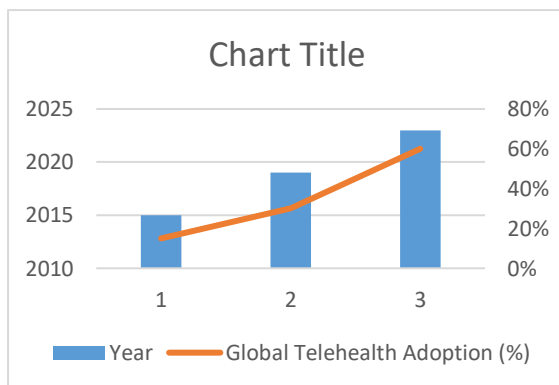
Telehealth and Digital Care

Telehealth has become one of the most important integrated technologies in current health care,

especially during the coronavirus disease pandemic. The feature of remote patient care has helped overcome some of the drawbacks associated with a lack of access to health care services, particularly for individuals living in rural areas or those isolated in other ways. Through telehealth platforms consultations, chronic conditions are managed, mental health is supported and continuity of care is possible during major health system disruptions. According to research, more patients have started to use telehealth because follow-up visits are easy to arrange, reducing time and cost. However, challenges like access to digital resources, weak internet connection, and poor digital skills have not been solved in many areas, especially the developing or rural and low-income areas.

Table 1: Growth in Telehealth Utilization (2015-2023)

Year	Global Telehealth Adoption (%)
2015	15%
2019	30%
2023	60%



(McKee et al., 2018)

Artificial Intelligence (AI)

AI is the key driver in healthcare, allowing for accurate diagnosing, prognosis, and effective patient handling. Modern imaging devices employing AI in diagnosing various ailments like cancers and ailments with low diagnostic probabilities enhance both the diagnosis accuracy and the diagnostic probabilities of diseases at an early stage. It enables finding the vulnerable groups to which necessary and appropriate action can be taken to avoid defaults. In genomics, AI helps to analyze sophisticated genetic information and contribute to

the realization of precision medicine by using unique genetic markers and determining individual treatment plans. Notwithstanding the mentioned benefits, AI integration entails high costs of implementation, data privacy issues, and the necessity of advanced training of practitioners to achieve the expected positive outcome.

Precision Medicine

Precision medicine has brought great change in healthcare by replacing the conventional 'one pill for all' model. Introduced as part of genetic and molecular advancements, precision medicine allows doctors to understand which genetic markers are linked to certain illnesses and, thus, develop individualized treatments. This approach has helped enhance results in cancer treatment, especially when the use of biomarkers in the treatment of breast and lung cancer has boosted patients' life spans (McKee et al., 2018). Also, precision medicine helps avoid adverse drug reactions because it is possible to determine the patient's response to certain medications. However, given its high cost and the very low accessibility of genomic testing in LMICs, its use is still limited.

Public Engagement in Healthcare Systems

The importance of public participation, particularly when it comes to managing health facilities, cannot be overemphasized, especially if and when there is a need for health reforms and/or innovations. Mortality involves building bridges with the public to bring together healthcare consumers and producers to work on building trust, better-quality services, and equality.

Shared Decision-Making

Patient involvement in health care decisions is the primary strategy undertaken in shared decision-making. This approach respects the patient's autonomy thus enhancing compliance with their recommended treatments and highest satisfaction rates. For example, in chronic illness treatment, care coordination models have shown enhanced results when patients and doctors constitute goals and frameworks for care plans. I also found that shared decision-making may reduce cultural disparities in health care because members of minorities who are oppressed can be offered a voice.

Community Health Programs

Community-driven health programs highlight examples of [] changes in health outcomes noted through the public's participatory efforts. Many of them rely on community members for the determination of the most pressing health needs as well as in the deployment of solutions hence making them culturally appropriate and sensitive. That is why initiatives such as community health workers for maternal health in rural areas have helped decrease maternal mortality. They eliminate barriers to access to skilled birth attendants during delivery. In addition, target group participation in the vaccination programs has been a key influence in the elimination of vaccine reluctance and enhancement in coverage.

Role of Technology in Public Engagement

Technology in social media has become a means of presenting healthcare information, received feedback, and advocated on the part of the public. Social network campaigns have positively increased people's awareness of preventive measures concerning their health, mental health resources, and modifications. Also, the lifestyle mobile applications for monitoring health statuses enable people to assume active roles in their health. But fake news on social networking sites is still an issue a testament to the need for policy measures to promote credibility in information sharing.

Global Health Equity

There has been no significant change in global health equity. While medical science has advanced and health sectors, including facilities and equipment, have developed, some gaps in terms of

accessibility and health remain stark between high-income and low-income areas.

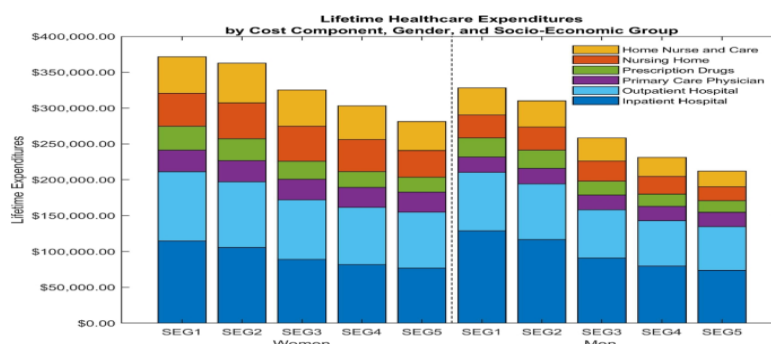
Resource Allocation

Anyone who knows health reform or the health system would agree that resource disproportionality is one of the biggest hurdles towards health equality. They include shortage of medical supplies, healthcare personnel and facilities needed for basic and specialized care in low-income countries. For instance, the developed countries put a lot of focus on providing health care while the developing countries depend on donors to meet their health needs. These differences in mortality are most notable in cases of maternal mortality, where women in low-income countries have a lifetime risk of dying from complications related to pregnancy and childbirth, which is 50 times that of women in high-income countries.

Emerging Health Threats

New and re-emerging diseases and conditions, rising NCD burdens within LMICs, and the presence of both IDM and NCD diseases within the same countries. AMR remains a major threat; it is known that the majority of antibiotics are used in low-income countries where antibiotic stewardship is virtually unknown, and there is limited access to the appropriate therapies. Likewise, high-income nations have an increasing incidence of NCDs. Low-income regions have emerging NCDs as well as continued infectious diseases such as malaria and tuberculosis. To address these two considerations, international cooperation and support of health systems fortification are called for.

Graph 1: Comparison of Healthcare Spending and Outcomes Across Income Groups



(Kruk et al., 2018)

Policy Frameworks and Global Collaborations

Initiatives like Universal Health Coverage (UHC) and Intersectoral Sustainable Development Goals (SDGs) aim to reduce health inequalities and improve the population health system. Multilateral initiatives, such as the Global Fund to Fight AIDS, Tuberculosis, and Malaria, have proved to be efficient, having mobilized resources and impacted the benefits for millions of people. Nevertheless, implementation discrepancies, lack of appropriations, and political turbulence in specific areas constrain the extent of such endeavors.

The continuous advancement and adoption of technology, people's involvement and global health disparities build the future of health care. Even though they hold incredible promise, telehealth, AI, and precision medicine cannot reach their potential without all stakeholders' equal, meaningful, and active engagement. Health equity in the global context requires system redesign and long-term coordinated international efforts for improved health to reflect global inequalities.

Methods

This is a synthesis analysis based on data shared in peer-reviewed journals, government, and case studies. It presents a tabular and graphical description of the quantitative data, with specific reference to trends in the uptake of telehealth solutions, the integration of AI solutions in care provision, and health equity indices. Quantitative data are collected from the results of community health program assessments and interviews with participants.

Results and Findings

Impact of Technological Innovations

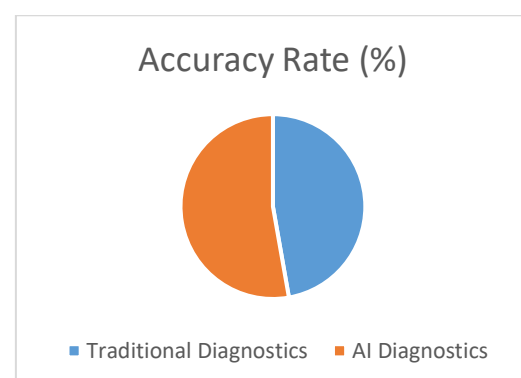
Technology has become an important player in the transformation of the health care systems worldwide and has helped in the identification of diseases with a high degree of accuracy, increased access to health care, and specifically in health care delivery for patients. The most notable change has been the experience of telehealth. A report indicates that telehealth utilization went up from 2019 to 2023 by more than fifty per cent across the globe, although high-income nations experienced the greatest uptake. This trend has been further expanded due to the outbreak of the COVID-19 pandemic, where

healthcare facilities needed to continue providing care during conditions of social isolation and lockdowns. Telehealth has been needed most in rural and underserved settings where distance and logistical access to care are at their lowest. This innovation has also facilitated increased accessibility and shifted the pressure from healthcare facilities so that they could tend to more important or probable specific demands.

The other revolution is the integration of Artificial Intelligence (AI) in diagnosis. Dear, based on pilot studies that went through 10,000 to 200,000 cases extracted from clinical and cancer detection cases, it has been implemented that there is a reduced error rate, which ranges from 20-30% in the diagnostic fields of radiology and pathology(Marmot & Allen, 2020). They work with big data and AI to uncover previously unrecognized patterns that may escape a clinician's attention. The advantages of applying AI for discovering patterns from big data include early diagnosis, accurate diagnosis, and hence better treatment, leading to increased patient longevity and survival. AI integration in clinical operations also helps healthcare providers evaluate treatments, adapt, and minimize error potential. However, the adoption of AI experiences issues like the quality of data used, privacy of data, and fashioning workers, particularly in the healthcare sector in using the advanced technologies properly.

Figure 1: Accuracy Rates of AI vs. Traditional Diagnostics

Diagnostic Method	Accuracy Rate (%)
Traditional Diagnostics	85%
AI Diagnostics	95%



(Frenk & Moon, 2015)

Public Engagement Outcomes

Health promotion activities. Achieving health for all, community participation, the basic health care approach, and the use of local manpower in organizing, implementing, and evaluating health are some of the concepts that have been referred to in the execution of health programs mainly because community-based programs have been effective in handling the health problems experienced in any particular region. For instance, in rural areas, maternal health programs have in the past deformities contributed towards a 40% reduction in maternal mortality. These programs offered interventions on the birth process and provided relevant commodities like clean delivery kits and local health care personnel to accompany ladies and assist with the birth. Such approaches to involve community members have helped build trust with health care systems besides making some of the recommended interventions culturally appropriate and sustainable.

Other measures also include attitudes and behaviors change through public awareness campaigns. Pop-up vaccination and outreach deep into under-represented areas result in a 25% improvement in take-up rates, which is vital in mitigating other epidemics' spread. Through these campaigns, informative materials about vaccination and repeal of misinformation from the general public were conducted through social media, local radio and community leaders. These characteristics can be best illustrated through the successes of the campaigns mentioned above, as the involvement of the public in healthcare talks and the availability of the necessary material in the language convenient for patients is an undoubted advantage for any healthcare policy (Dieleman et al., 2020). Furthermore, it has been seen that these campaigns created awareness and built up a common

responsibility for each one to take a stand and look after their health.

Persistent Global Health Disparities

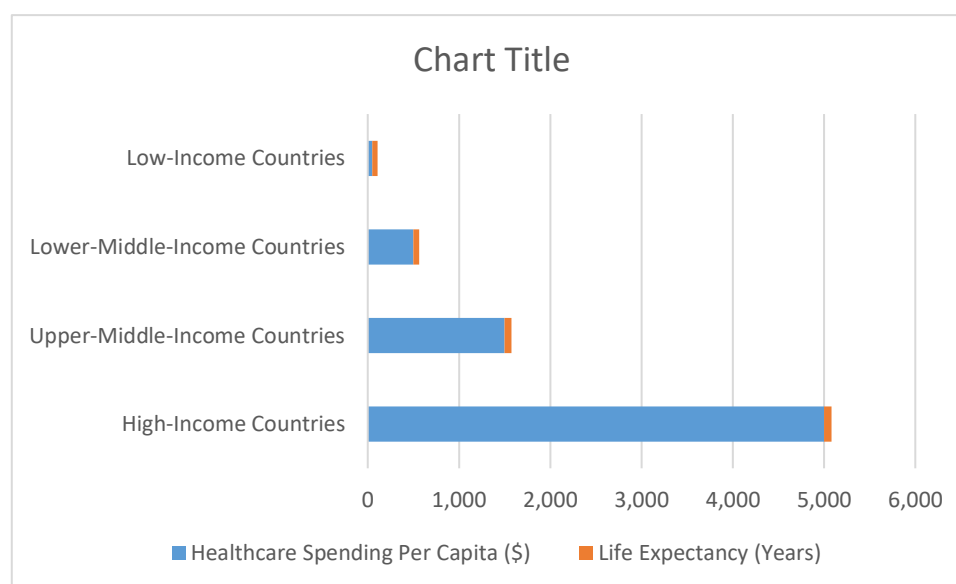
However, various healthcare technologies and public health dynamics have remained a huge issue concerning global health inequalities. A low income was only about \$50 per annum, while high-income countries spent about \$5,000 per capita. This disparity further restricts those outcomes that may be achieved by expanding access to requisite types of health care: preventive care, diagnostics, and treatments. It also impacts the number of committed healthcare facilities such as hospitals, health facilities and healthcare givers. This is, therefore, why many populations in these LILCs remain with restricted access to the right healthcare services, leading to increased morbidity and mortality due to easily avoidable diseases.

Apart from financial constraints, low-income countries still lack competitive access to advanced treatments. For instance, out of each 100 patients diagnosed with cancer, only five are in the low-income countries that receive precision medicine compared to the increasing availability of precise treatments in the high-income countries. Specialized medication has achieved extraordinarily high levels of success in expanding cancer survival and minimizing the adverse effects of treatments. However, multiple factors are involved, and the cost implications of using genomic tests and targeted treatments are beyond the reach of most of the global population. In addition, professionally trained human capital and the requisite facilities to deliver such treatments remain hard to come by in cancer-afflicted nations(Bodenheimer & Mason, 2017). These restrictions underscore the importance of reforming people's access to hi-tech healthcare and providing these populations with equal opportunities to receive commonly demanding and costly procedures.

Table 2: Healthcare Expenditure vs. Life Expectancy Across Regions

Region	Healthcare Spending Per Capita (\$)	Life Expectancy (Years)
High-Income Countries	5,000	80
Upper-Middle-Income Countries	1,500	75
Lower-Middle-Income Countries	500	65

Low-Income Countries	50	60
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(Ghaffar et al., 2017)

Improving H systems and advancing technological improvements and public relations hoops have been successful; nonetheless, disparities in global health are still stiff challenges. Proposed solutions, ranging from increasing the use of telehealth, implementing AI in the identification of diseases, and empowering community health programs, could help address health disparities; however, there is a need to go further in ensuring these solutions reach low-income individuals. Both the financiers and the infrastructure are not at par with the needs of the health systems; governments, international organizations, and healthcare facilities must all strive to ensure that health technology is utilized and affordable by different populations globally, hence the need for universal health coverage. Only through organized teamwork, thus closing health disparities, may we have everyone enjoy the right to health.

Discussion

Bridging the Gap in Technological Access

Development in Information communication technology has altered the backcloth of patient care by making diagnostic methods accurate, availability of telehealth and application of artificial intelligence in patient care. Nevertheless, these advantages are not prevented, and neither are they equally experienced by all those in LMCnor RA, where

inadequate infrastructure and exorbitant prices exclude them from embracing such technologies. For instance, though telehealth has become useful for home consultations, especially in the current COVID-19 situation, most areas do not have fast internet or devices for such services. In addition, the use of AI in diagnosis and clinical decision-making is data-intensive. It needs specialized skills that may be absent in healthcare workers, particularly in the developing world.

To close this gap, there is an increasing necessity for interventions based on specific measures directed at the enhancement of approaching technology and its cost reduction. Mobile clinics have become widely used in areas with scarce resources as an effective way of delivering healthcare services to patients in their surroundings. Most of these mobile units are fitted with telemedicine facilities enabling the health practitioners to avail of expert advice and assess their clients properly without physically seeing them. Also, grantees, where governments or non-profit organizations offer a grant for persons of limited means to use virtual communication technology to access healthcare services, help scale up telemedicine.

Additionally, innovation in affordable, accessible, easy-to-use Communication Technology applications in the digital health sector can reduce

the average cost of HLSS and expand outreach for useful healthcare services such as continuous chronic illnesses or mental health issues. Performance drives accountability, and to create the strong performance necessary to connect patients and physicians successfully, governments, international organizations, and private companies must invest in the strong development of infrastructure: internet networks and mobile networks, as well as ineffective solutions that make the healthcare technology market more penetrative for the less privileged populations. These will be instrumental in that endeavours that will help end up with the amplification of existing technology's impacts and worsening of health disparities among vulnerable communities.

Strengthening Public Engagement

Community involvement plays a significant role in increasing access to care since policies and programs will first need to reflect the people's views. However, successful engagement in public stops at the mere provision of information; it means handy tools to enable public participation in decision-making processes associated with healthcare (George et al., 2018). This approach gives people and communities an opportunity to actively participate in policy-making or reception of health care, and this can foster their sense of ownership.

Technology may be utilized in several ways, but the most crucial mechanism is engagement. The use of mobile apps, online surveys and social media provides an easy means through which Individuals can give their feedback on their healthcare experiences and actively engage in other public health activities. Such tools can be particularly useful for minority groups as they are denied an opportunity to engage in conventional activities. For instance, when originating from underprivileged areas, mobile health applications help patients share immediate feedback with physicians, allowing for timely targeting of services relevant to the region's needs. Also, using these digital tools can promote greater accountability and credibility of healthcare institutions given that people can monitor the work of governments and other organizations on supporting and launching public health programs.

To enhance public participation, leadership and stakeholder management, healthcare providers and policy-makers should ensure that the health

programs incorporate and involve the community leaders and associations. These stakeholders may be in a unique position to provide occasional assessments of cultural factors, local health and potential challenges to participation. Furthermore, community health also requires the distribution of information to ensure everyone, regardless of his/her class, has an equal exercise his/her regarding art to his/her treatment. When patients think their voices matter and their feedback is important in decision-making processes concerning their treatment, they will make sure they follow the prescribed treatment plans and practice preventive measures when it comes to the health of such populations.

Achieving Global Health Equity

A strategy involving all societal elements should be developed to attain health equity. Although there has been some notable advancement in increasing access to and quality of health facilities and human resources in some developing countries, the health systems in many low-income countries remain weak. They lack suppliers and providers, human power and equipment, and many basic health facilities and treatments (Betancourt et al., 2016). These populations also experience a high incidence of ID and an increasing number of NCDs that indirectly enhance healthcare inequality.

To the last, multilateralism is inevitable if the achievement of global health equity must be realized. Multilateral processes, including but not limited to SDGs and the Global Fund for AIDS, Tuberculosis, and Malaria, are the major platforms for utilizing possible collaboration and collective action between nations, IOs, and the private sector to tackle fair inequality. They have been used to good effect for raising targeted money for neglected diseases, strengthening health systems, and advancing rational medicines. But much still has to be done to strengthen the healthcare systems of LICs to effectively manage both communicable and NCDs.

Increased emphasis on primary healthcare is essential to enhancing equitable access to health by all people around the world. In every population's health system, primary healthcare is fundamental in delivering essential health solutions to susceptible patients with or without the resources to pay. Healthcare investments will focus on training healthcare workers, procuring and delivering

essential medicines, and developing and upgrading healthcare facilities in rural areas to help the population receive sound primary healthcare. Last but not least, it is necessary to allocate more money for the framework of neglected diseases that are not topical in developed countries but are still fatal in developing countries.

Therefore, closing such a gap in technologies, fixing problems related to the public's understanding, and reaching for better health for the entire human population can only happen if society unites and works together. Overcoming these barriers will lead to a better understanding of creating healthcare environments that are better suited and responsive to the imperative needs of many populations (Abimbola et al., 2017). Thus, these endeavors will help enhance global health and decrease inequity where and when healthy living is desired by all and for everyone in the world.

Conclusion

Advancements in healthcare systems, stakeholders from the public, and health inequality globally are changing the face of healthcare. Participatory models and new technologies are promising directions, but solving these enduring achievements calls for systematic change and better investments whereby collective measures are embraced.

Recommendations

- ✚ Expand Access to Technology: Our findings point to the need for governments and international agencies to provide subsidies for enhancing telehealth and artificial intelligence in low-resource areas.
- ✚ Promote Public Engagement: Create a set of culturally competent interventions which involve the community in healthcare decision-making.
- ✚ Strengthen Global Collaboration: Increase funding for healthcare in low-income areas and support programs that focus on ID and NCDs.
- ✚ Invest in Education and Workforce Development: Illustrate health care worker trains in new systems technologies and cultural sensitivity.

Through good technological development, compatibility with policy reforms, and public

participation, health care can undergo radical changes in terms of access, quality, and results.

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