

The Introduction of Novel Healthcare Technologies and Methods In Least Developed Countries

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On my honor as a University student, I have neither given nor received
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Introduction

Modern medicine and the techniques associated are a privilege that many of us enjoy on a daily basis, however a slew of cultural, fiscal, and technological barriers lie between LDCs and their I will be exploring the introduction of medical innovation to nations defined as “least developed” as defined by the UN Committee for Development Policy(CDP)(Mollerus n.d.). These least developed nations, scattered mainly throughout sub saharan Africa and southeast Asia, otherwise known as “LDC’s” account for roughly an entire 13% of the world’s population, further defining the scope of a major humanitarian crisis(Anon n.d.). These countries are often marred by consistent conflict, corruption at the highest levels of bureaucracy, and poor infrastructure and development potential, all of which contribute to a far lower than average quality of life for the citizens. Furthermore, healthcare in these nations is no exception to these trends as such decreased quality of life, life expectancy, and epidemic are all commonplace especially compared to developed first-world nations(Deaton and Tortora 2015; Moeti 2016). This research shows the skewed nature of advances in healthcare in favor of already developed nations. The significance lies in the benefits that could potentially be reaped as a result of the introduction of modern medicinal technologies and methods. Devices such as MRI machines or cutting-edge vaccines or procedures all exist as a commodity in the developed world that can almost be taken for granted while significantly enhancing the quality of life and life expectancy of the citizens. By exploring the causes of the existing disparity through an STS framework an important first step is taken in the process of identifying and solving the barriers that create this disparity.

Social construction of technology(SCOT) and the introduction of novel healthcare techniques and technologies

The Social Construction of Technology (SCOT) suggests that technology is not a purely objective or neutral entity, but rather a product of social, cultural, and historical factors that shape its development and use. According to this theory, technology is not simply invented by engineers and scientists, but shaped by the values, norms, and power relations of the society in which it is created and used. In the context of medical technology in developing nations, SCOT suggests that the development and use of medical technology cannot be understood purely in terms of technical or scientific factors, but must also be analyzed in terms of the social and cultural factors that shape its use. For example, the availability of medical technology in developing countries may be influenced by political and economic factors, such as the priorities of government funding and the availability of resources for healthcare. The use of medical technology may also be influenced by cultural factors, such as attitudes towards illness and healthcare, as well as by social and economic factors, such as the availability of trained medical personnel and the cost of medical treatment. In addition, the SCOT suggests that the development of medical technology in LDCs should be understood as a collaborative two-way process that involves not only engineers and scientists, but also patients, and community members of both parties. This collaborative approach can help ensure that medical technology and methods are developed and used in ways that are responsive to the needs and priorities of local communities, and that take into account the social, cultural, and economic factors that shape healthcare in developing countries.

The Effect of poor infrastructure in LDCs

Least Developed Countries otherwise known as LDCs are a classification of the UN Committee for Development(CDP). These nations, located primarily in sub-saharan Africa and Southeast Asia, are characterized as having severe infrastructural handicaps that prevent development and growth of GDP(Anon n.d.). The already lacking infrastructure mean that these nations are by default far more vulnerable to major disasters that only serve to exacerbate the ongoing humanitarian crisis faced by these nations such as epidemics, natural disasters, and near constant warfare and corruption(Seyf 2001; Tchole et al. n.d.).

While lack of monetary resources may stand as an obvious barrier to these nations they are not the standalone answer to these nations problems(Moeti 2016). These nations additionally face series of other setbacks that must be addressed in order to improve healthcare. One of the key issues is the lack of expertise and those with the technical knowledge to properly operate in a healthcare setting such as doctors and nurses(Ighobor 2016; Yates and Lillie n.d.). Due to the poor standard of living, those who can find work outside of their home nations are very unlikely to stay and as such mass migrations of skillful workers, known as brain drain, contribute to the lack of skillful people. This alongside the lack of strong education means that nations are producing talent at a far slower rate than first-world nations, further aggravating the lack of technical knowledge in these countries.(Salmi 1992).

In the case of healthcare, this generally presents as low matriculation rates for healthcare professionals in these nations. Generally occurring to due to the already lacking educational infrastructure, most LDCs employ an expedited 4-5 year medical program to increase the number of doctors available however the affordability and poor range of treatments.

Brain Drain

Brain drain refers to the emigration of highly skilled and educated individuals from their home country to another country, for better economic opportunities, better living conditions, or better career prospects. The loss of these skilled workers then in turn acts to aggravate the poor infrastructures in these nations, especially healthcare. Brain drain has adverse effects on the healthcare systems of LDCs, including the quality and accessibility of healthcare services. One of the primary causes of brain drain in healthcare in LDCs is the low wages and poor working conditions. Healthcare professionals in LDCs often earn lower wages than their counterparts in high-income countries (HICs), even though the workload and job demands are often higher. Moreover, they face limited opportunities for professional development and advancement, which discourages them from remaining in their home country. As a result, many healthcare professionals in LDCs choose to migrate to HICs where they can earn higher wages and have access to better living conditions(Llasco 2021). The effects of brain drain in healthcare in LDCs are significant. The loss of highly skilled healthcare professionals reduces the capacity of LDCs to deliver essential healthcare services. As a result, the remaining healthcare professionals face increased workloads and may have limited opportunities for professional development. Brain drain also creates a vicious cycle, whereby the loss of healthcare professionals leads to poorer health outcomes, which, in turn, makes it more challenging to retain and attract skilled healthcare workers. Several strategies have been proposed to address brain drain in healthcare in LDCs. These include improving working conditions and salaries for healthcare professionals, investing in training and education programs to develop a highly skilled workforce, and implementing policies that discourage the migration of healthcare professionals.

The United Nations and other international organizations have also developed programs to support these nations in addressing the issue of brain drain in healthcare.

The Cultural Stigma Facing Medicine

These nations' citizens have a tendency to stigmatize modern medicine and healthcare and who should receive it. In Ghana this can clearly be seen by the fear held by women of certain abdominal procedures as well as the fear of being socially outcast should they go through with modern procedures(Gyedu et al. 2016). This fear of the doctor's office while not omnipresent in all developing societies still proves a massive issue to overcome. Also known as "white coat syndrome" Patients in LDCs are often afraid of seeking medical care due to a lack of trust in the healthcare system, concerns about the quality of care, and financial constraints. Furthermore, patients may have had negative experiences with healthcare providers or may be uncomfortable with the invasive nature of medical procedures. Additionally, a lack of understanding or education of the procedures or medicines can contribute to apprehension from treatment. Fear of the doctor's office can lead to delays in seeking medical care and can have serious consequences for patient outcomes. Healthcare providers must work to address patient fears and concerns in order to improve access to healthcare and ensure that patients receive the care they need. In order to combat these issues, increased communication between patient and doctor as well as the integration of traditional local medicines to modern practices have shown promise(Oyebode et al. 2016).

Affordability

While on a macroscopic level the modern medicine is difficult to import to these countries due to lack of financial resources on a national level, the issue persists to nations to the citizens of these nations. Oftentimes procedures that can dramatically increase the quality of life and productivity of a citizen are far out of reach due to cost. One such widespread example is the treatment of cataracts, costing roughly between \$3000-6000(Isaacs, Ram, and Apple 2004), is a treatment which would incur catastrophic expenditures on even the average citizen of an LDC. These expenditures often make these procedures completely inaccessible to some citizens while others will deny the care due to fears of financial ruin. Confounding this, and especially in the case of cataracts, chronic and often curable conditions potentially decrease the productivity and in turn ability to earn, worsening the financial position of the sufferer. This creates a strong incentive for pushing the focus of research of modern medicine towards reducing the costs associated with treatment.

Corruption and The Delivery of Aid

Aid is meant to assist these countries in improving their economies, infrastructure, healthcare, education, and other essential services, but corruption often prevents it from reaching the intended recipients. Corruption in LDCs can take various forms, such as embezzlement of funds, bribery, nepotism, and favoritism, among others. The impact of corruption on the delivery of aid to LDCs is immense, corruption diverts aid funds away from their intended purpose, often leading to the enrichment of corrupt officials or their associates, as a result, essential projects are either not implemented or poorly executed, leading to inadequate service delivery to the population(Seyf 2001). In some cases, aid is channeled to projects that have little impact on the population, or projects that are politically motivated rather than being based on actual needs

creating an air of political distrust. Corruption creates an environment of distrust, leading to a loss of faith in government institutions and aid providers which in turn can discourage donors from providing further aid and deter investors from investing in the country, leading to reduced economic growth and development. Funds that are intended for social services such as healthcare programs are often diverted to personal accounts, leaving the poor without access to essential services. As such aid critical to the development of infrastructure necessary for education and healthcare falters leaving little room for growth. In conclusion, corruption and collusion have an incredibly significant and overbearing impact on the delivery of aid to LDCs, contributing to the vicious cycle of poverty in these nations. As such in order to ensure proper delivery of aid to nations meant to bolster the healthcare system it is necessary to realize that those in power or private actors may require closer surveillance and increased rigor in managing the provided funds.

Conclusion

The humanitarian crisis in LDC's seems to be on an upward trend as the gap between the first and third-world continues to rise. Identifying the key inefficiencies in the protocol set about to address current crises grows increasingly pertinent and is it important to recognize how and why such issues occur. Solving these issues may involve technical support however there is still room for improvement both on the side of engineers and those in policy to implement methods that ease the integration of modern medicine. These solutions should follow a threefold that takes into account the unique social, fiscal, and political barriers that disallow these nations from receiving the critical aid they need. By implementing SCOT, a more nuanced understanding of why aid is unable to be delivered efficiently and effectively to these LDC's rather than more simplistic views that look purely at the haves and have nots. Such as the blending of traditional

medicines and modern medicines to ease a transition, the issue is not all black and white in that instance. Driving healthcare resources into these nations alone is not enough of a solution and in some cases can turn a bad situation into an even worse one so it is paramount to understand how to properly introduce modern medical techniques and technologies to these nations.

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