THE DIGITAL DIVIDE: HOW eHEALTH INTERVENTIONS FAIL TO BRIDGE THE GAPS IN HEALTHCARE ACCESS IN POOR URBAN COMMUNITIES

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By

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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INTRODUCTION TO ENGAGEMENT WITH AND ACCESS TO eHEALTH

Many Americans avoid visiting their doctors or receiving medical care even if they are experiencing serious or major health concerns (Taber, Leyva, & Persoskie, 2015, p. 290). Factors such as financial disparity, inadequate insurance coverage, and lack of physicians are all impediments that prevent individuals from receiving the treatment they require (Harvey & Gumport, 2015).

Electronic health interventions, eHealth, are one proposed solution to healthcare disparity in communities with limited access to traditional healthcare, but it has its own complications. The medical community feels eHealth has, "great potential to increase availability and equitable distribution and resources" (Olff, 2015, p. 1). Leveraging technologies that are commonly available and popular in the United States makes eHealth technologies an attractive option for patients who may not have otherwise sought treatment for their illnesses.

Though eHealth technologies have the potential to engage more patients with much needed access to healthcare, they have some key problems. One problem is attrition, which is addressed in a complementary technical report that uses personalization and implementation intentions to provide a technical solution to the high dropout rates of MindTrails, a specific eHealth technology. Another issue with eHealth interventions is that there remains a considerable segment of the population that cannot access digital healthcare. Underserved communities are considered to be on the wrong side of the "digital divide" and suffer from a lack of broadband infrastructure or dependability of access due to geographic region or demographic factors like race, ethnicity, or socioeconomic status. Through an exploration of the technical and socio-ethical implications of digital health technologies, this thesis will analyze the effect and ability of telemedicine to impact poor urban communities and ultimately aims to inspire increased infrastructure to improve dependable access to digital technology. The focus of the

research will be on the origins of digital infrastructure as it continues to transform, and how the technology is diffused and adopted throughout the United States. By examining the problem through the lens of Rodger's Diffusion of Innovation framework recommendations will be made to address healthcare inequality and the digital divide in poor, urban communities using a modified version of the Social Construction of Technology framework. Both the technical thesis, which addresses attrition and potential solutions for MindTrails, and the sociotechnical thesis, which addresses another aspect of eHealth engagement, are tightly coupled as they both relate to the effectiveness of eHealth technologies.

THE PREVALENCE OF POVERTY IN URBAN COMMUNITIES

Poverty is an epidemic in the United States and exists across community types, racial groups, and age groups. Across community types, however, poverty has different connotations and makeups that make the problem unique. When looking at the magnitude of poverty across the United States, as well as the concentration of poverty, it is highest in urban communities. Elizabeth Kneebone (2017) testified to Congress that, "urban residents remain disproportionately likely to live in areas of concentrated poverty… [at a] rate of 25.5 percent, compared to 13.7 percent in small metro areas, and 7.1 percent in both suburbs and rural communities" (Growing Concentrations of Poverty section, para. 4).

While urban poverty cannot be characterized by a single racial or ethnic group, the idea of urban poverty has been racialized to be associated with people of color. This sentiment is true in the sense that "mostly minority inner cities are characterized by the unique phenomenon of concentrated poverty," however, not all communities of concentrated poverty can be racially identified as such (Public Broadcasting Service, 2003, More Things to Consider section, para. 11). The focus of alleviating urban poverty should focus more on the fact that, "inner-city residents face intense spatial isolation and inadequate public resources, education and economic opportunities. As more and more people leave [the city for suburbs], costs for basic services rise and the poor become even poorer" (Public Broadcasting Service, 2003, More Things to Consider section, para. 11).

Examining the racial and socioeconomic demographics against the distribution of physicians in urban communities, studies found that:

> The supply of physicians was more strongly associated with the proportion of black and Hispanic residents in the community area than with the area's income level. In urban communities, areas with high proportions of both black and Hispanic residents had, on

> average, the lowest ratio of physicians to population. In contrast, urban areas with high levels of poverty and lower concentrations of Blacks or Hispanics had three times as many physicians per capita. (Smedley, Colburn, & Evans, 2001, p. 68)

BARRIERS TO TRADITIONAL HEALTHCARE IN POOR, URBAN COMMUNITIES

In poor, urban communities there are many barriers to receiving adequate healthcare, namely financial means and availability of doctors. A study conducted by Syed Ahmed, Jeanne Lemkau, Nichol Nealeigh, and Barbara Mann (2002) identified that in a sample of poor urban residents from Dayton, Ohio, the most common barriers to healthcare reported were:

(i) lack of information about discounted or free healthcare services;
(ii) inability to pay;
(iii) difficulty finding someone to watch the children when seeking medical care;
(iv) difficulty taking time off work to seek medical care;
(v) difficulty finding transportation; and
(vi) past negative experiences with the healthcare system. (p. 447)

The conversation about healthcare access in poor and urban communities is often one about inequal supply for different levels of demand. In rural American communities, one major barrier to healthcare access is, “there are not enough doctors,” in urban America access demand is not met because, “there are not enough appointments” (Huilgol et. al., 2017, para. 2). Barriers to healthcare can also include financial barriers which is supported by data which states that 32% of uninsured urban individuals reported that they delayed care when they needed it because of a lack of means (Huilgol et. al. 2017, Urban and Rural Areas Face Similar Access Challenges section, para. 1). This is further indicated by the National Center for Health Statistics (NCHS) 2012 findings in Figure 1, on page 5, that conclude that those living in poverty delay receiving medical care because of the financial burden (p. 46). This graph indicates that in almost every year between 2000 and 2010 the percentage of individuals who avoided or delayed medical treatment went up as their income level went down.

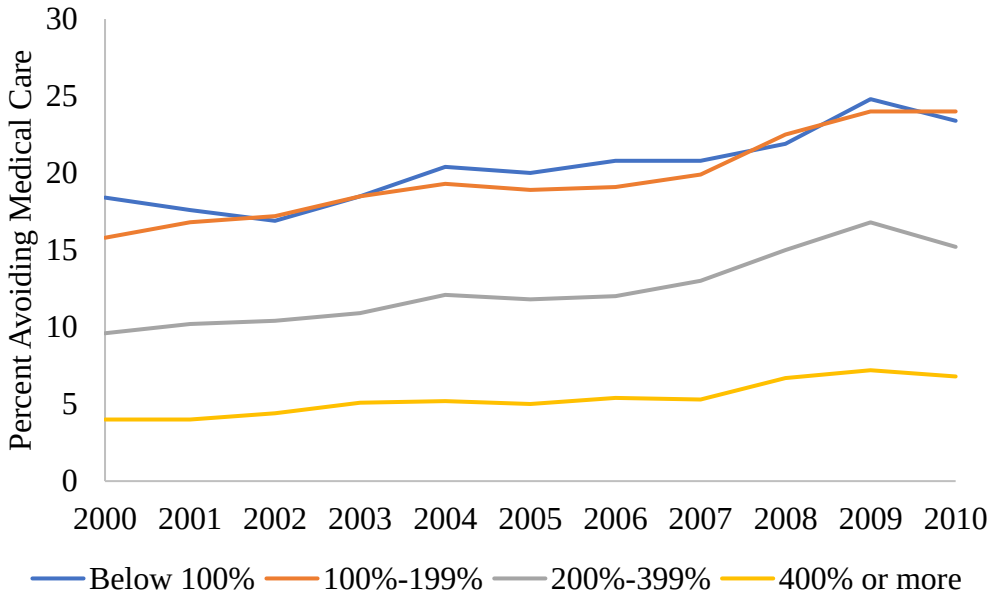

Figure 1: Individuals who Delay Medical Treatment by Poverty Level: The percent of US adults that delayed needed medical treatment because of the cost, stratified by their closeness to the poverty line (McGowan (2020) adapted from National Center for Health Statistics, 2012, p. 46).

As a result, in poor, urban communities, residents are more likely to face serious health consequences because of a lack of access to adequate treatment. When examining the health statistics of people living in poverty, there is a clear connection between low income and poor health outcomes. The National Center for Health Statistics (2012) performed a special study on the association between socioeconomic status and health and found that adults living in poverty had a life expectancy seven years shorter, were four times as likely to suffer from depression, and were more likely to have numerous chronic diseases which is depicted on page 6 in Figure 2 (pp. 37-40). The American College of Physicians (1997) use the term urban health penalty to describe the phenomenon of wealthier individuals leaving the city behind to deal with a deteriorated economy and social system, including healthcare (p. 486). They argue that this penalty disproportionately affects minority groups that are already socioeconomically disadvantaged. Not only do poor, urban residents have less ability to access quality healthcare,

they are also at risk for some diseases that are, "characterized by poor nutrition, inadequate and unsafe housing, exposure to violence, and lack of a social services infrastructure" (p. 486). The problems of poverty and healthcare are dependent on each other and often create a cyclical pattern from which poor, urban residents cannot escape.

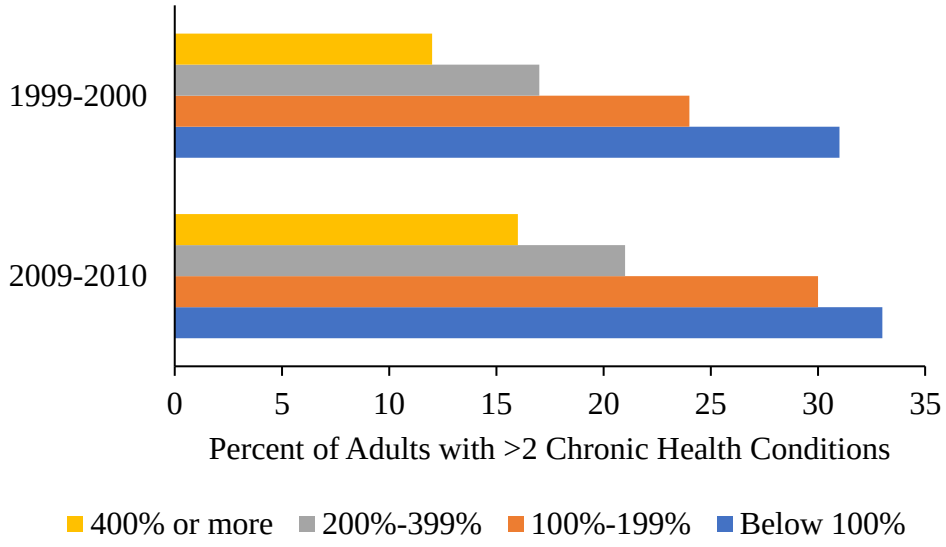

Figure 2*:* US adults with Two or More Chronic Health Conditions, by Poverty Level: The percent of US adults that had two or more chronic health conditions, based on their closeness to the poverty line (McGowan (2020) adapted from National Center for Health Statistics, 2012, p. 40).

EHEALTH TECHNOLOGIES AND THE DIGITAL DIVIDE

The lack of access to digital technologies of all kinds has been coined "the Digital Divide" and its definitions are as varied and evolving as technology itself. Early definitions of the digital divide are characterized by Jan van Dijk and Kenneth Hacker (2003) as the following:

> 1. Lack of elementary digital experience caused by lack of interest, computer anxiety, and unattractiveness of the new technology ("mental access").
> 2. No possession of computers and network connections ("material access").
> 3. Lack of digital skills caused by insufficient user-friendliness and inadequate education or social support ("skills access").
> 4. Lack of significant usage opportunities ("usage access"). (pp. 315-316)

More recent conversations about the digital divide, however, have begun to connect the lack of access to digital technology with other social disparities. As society continues to evolve, digital inequality has formed more strongly along the same lines as, "long-standing forms of inequality [such as race, class, and gender]" (Robinson et al., 2015, p. 570). As a result,

Robinson et al. further assert that digital inequality exacerbates social inequalities by bringing them into a new era and medium.

Much of the conversation surrounding access to technology and the Internet focuses on physical access. Physical access is most aptly described as the broadband connectivity and infrastructure that reaches certain communities. Cable Internet, fiber optics, and broadband connectivity are mostly available in urban and suburban areas but have yet to reach segments of the rural population of the United States. Salemink, Strijker, and Bosworth (2017) argue that a disparity in access to digital infrastructure causes a spatial digital divide in which, "people living in rural areas 'pay a price' for living in remote areas which affects many different economic sectors and social groups" (p. 360). The focus on physical access to technology highlights the disparities related to rural communities and demonstrates how they are unable to participate in aspects of an increasingly digital society, but does not acknowledge the digital divide as it relates to technical literacy or access dependability.

DEPENDABLE ACCESS IN POOR URBAN COMMUNITIES

While increasing the infrastructure for broadband connection is important to alleviating the digital divide, examining the dependability of current infrastructure and digital literacy reveals another digital divide. Amy Gonzalez (2015), contends that the digital divide now centers around the stability of access to digital technology, rather than just access to a broadband connection (p. 236). Though the problem of rural access to the Internet is important and should be considered as society depends more heavily on the technology, other communities must be included in the conversation about the digital divide. In large, densely populated cities, there are more people affected by a lack of dependable access to digital technologies than in rural

populations. As Figure 3 demonstrates, in November of 2017, nearly 75% more people living in urban communities than in rural communities reported that the main reason they do not go online at home is because the Internet is not available in their area (U.S. Department of Commerce, 2018).

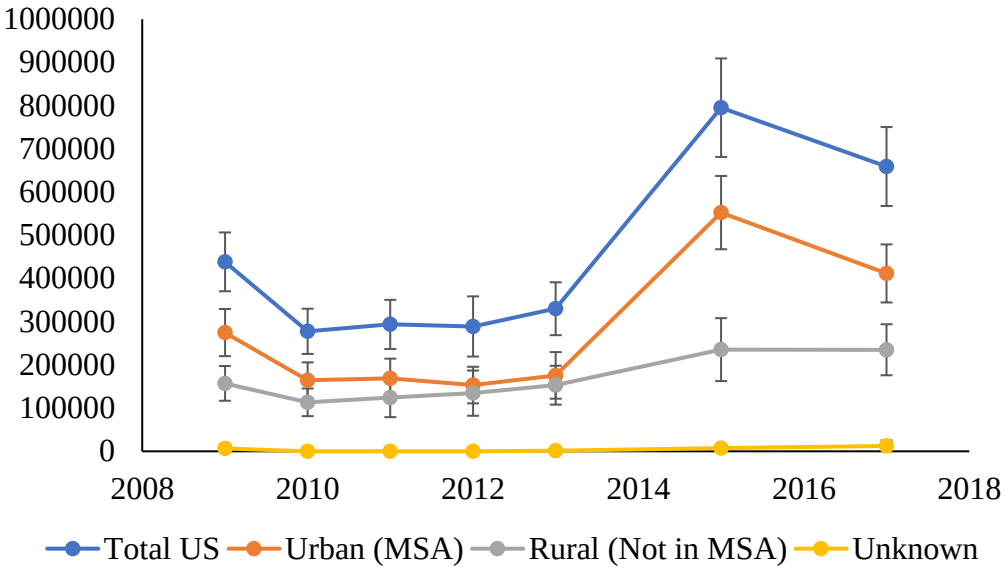

Figure 3: Individuals without Access to Internet at Home: The count of individuals stratified by population density who do not access to Internet at home due to a lack of availability (McGowan (2020) adapted from US Department of Commerce, 2018)

The difference in access disparity between urban and rural communities concerns more than just infrastructure. Rather, the lack of dependable access in urban communities ties in closely to other social inequalities, specifically race, ethnicity, and socio-economic status. Barriers such as the cost of bills, hardware, or public access services lead, "to ongoing cycles of dependable instability," for poor people of color living in cities (Gonzalez, 2015, p. 241). Each of these barriers contributes to the inability for residents of urban communities to gain access to the Internet despite the availability of broadband infrastructure. In her research, conducting interviews with patients from different regions and incomes, Gonzalez found that for many poor people of color living in urban communities, "the everyday difficulties of life outweighed the utility of in-home Internet access" (p. 242). The diversity in inner cities is connected to the diversity of barriers individuals face.

EHEALTH TECHNOLOGIES CREATING ADDITIONAL BARRIERS IN POOR URBAN COMMUNITIES

Disparities in access certainly call into question the populations that will even have access to digital healthcare. Extrapolating from the findings of Amy Gonzalez's (2015) study, as it relates to health information, the communities the with least access to digital technology are also least likely to engage with eHealth technologies, and this relationship can be used to argue that eHealth exacerbates existing inequalities surrounding access to healthcare. In a study for the Public Library of Science, Kasisomayajula Viswanath and Leland Ackerson (2011) found a correlation between low use of digital media to access health resources and a user's race, ethnicity, language, and social class (p. 2). These findings are important because they indicate that poor, minority participants are not only less likely to have access to digital health information, they may also be less inclined to pay attention or trust it. This creates a more complete picture of underserved populations and how their attitudes toward eHealth resources may factor into the success of those resources in poor communities.

The study conducted by Denizard-Thompson et. al. (2010) indicated that in their sample of patients from an urban health clinic only about a third had regular access to the Internet at home and less than a third could receive messages on a cell phone (p. 458). Their findings supported the ongoing presence of a digital divide and recommended caution in, "referring patients to the Internet for health information," because it could create gaps in the ability for an already vulnerable group to access needed health services (p. 458).

Chessar, Burke, Reyes, and Rohrberg (2015) noted that, "underserved populations are both more likely to have decreased access to health infrastructure and decreased opportunity to access technology" (p. 3). This dichotomy presents a research question that comments on the

possible effectiveness of eHealth technologies to serve those in need. eHealth technologies were designed to reduce the social inequalities surrounding getting access to healthcare, however, their reliance on digital technology may have instead isolated social groups that have limited access to digital technology. Without the ability to access eHealth technologies, these social groups will suffer another disadvantage and eHealth technologies will only serve to further the digital divide concerning access to healthcare.

Each of these studies demonstrates that the digital divide in urban communities is not only perpetuated by geographic factors, but also by the lived experiences of its residents. Figure 4, featured on page 11, models the interactions between different scales of social inequality and how they relate to technology. These interactions contextualize the digital divide in urban communities. In order to understand the digital divide, why it exists, how it persists, and the affect it has on the advancement of urban communities, race, gender, ethnicity, and socioeconomic status cannot be treated as static variables. An individual's ability to interact with technology is inherently tied to demographic factors, and therefore they cannot be ignored.

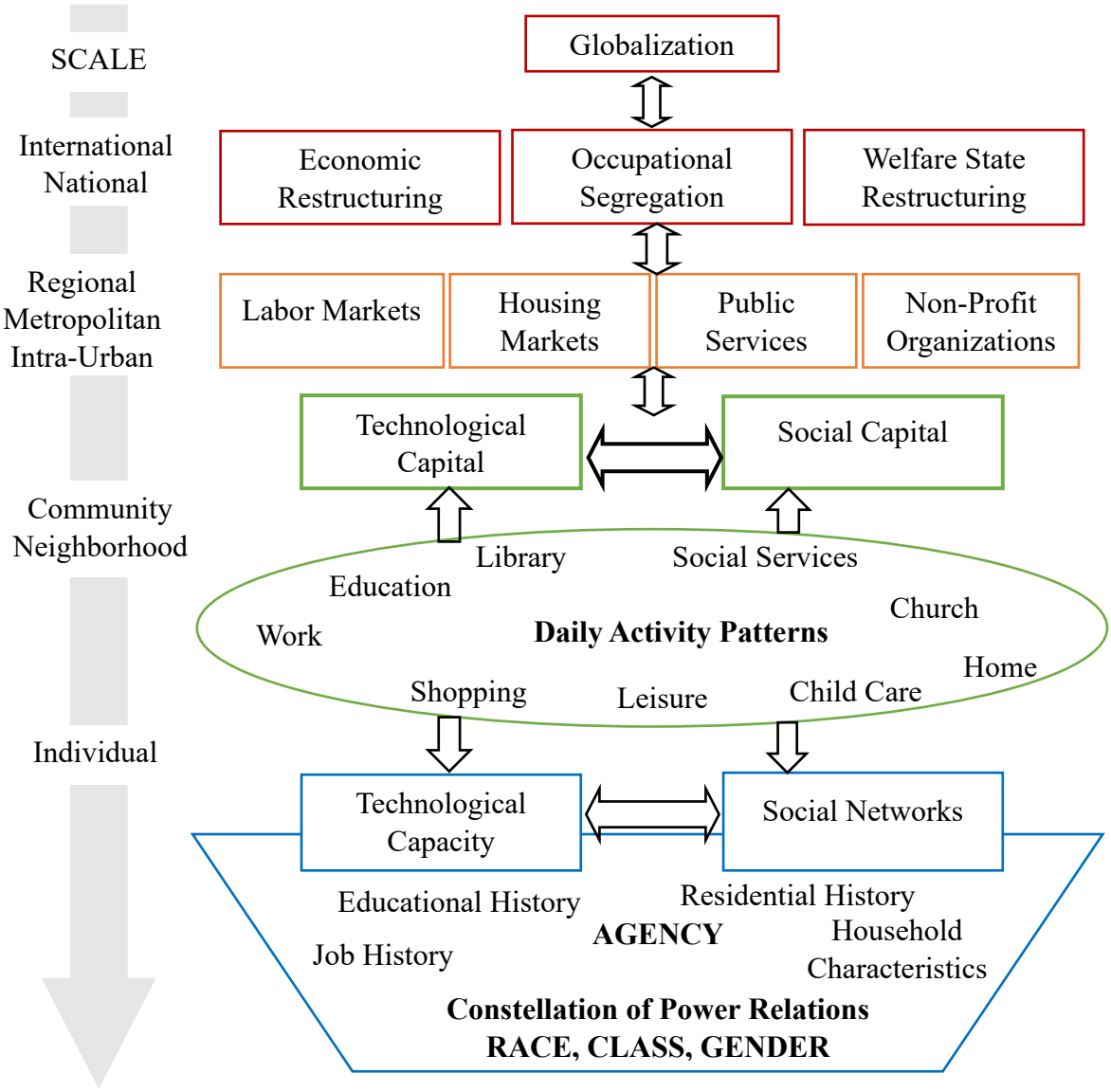

Figure 4: Modeling the Digital Divide through Urban Inequalities: A new model theorized by the author to contextualize the digital divide through other social inequalities (McGowan (2020) adapted from Gilbert, 2010).

EXAMINING THE DIGITAL DIVIDE THROUGH THE DIFFUSION OF INNOVATION FRAMEWORK

The digital divide is a manifestation of the stoppage of the diffusion of innovation for broadband technology. To determine the ability of eHealth technologies to serve underprivileged communities, an examination of the diffusion of digital technologies is necessary. The Diffusion

of Innovation Theory explains, “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, et. al., p.3). The diffusion of innovation into society usually occurs due to a need for individuals to, “reduce personal uncertainty when presented with new information, and the need for individuals to respond to their perceptions of what specific credible others are thinking and doing” (Dearing, 2009, p. 506). The limited spread of digital technology in the United States is a prime example of how the demographics of social groups affect the adoption of technologies.

The spread of many technologies throughout human history and the examination of barriers to the spread of digital technology across certain populations will allow for a clearer understanding of how these barriers can be overcome. Dearing (2009) observed that diffusionist theory dating back to the early twentieth century identified “jurisdictions as barriers to diffusion, and the importance of proximity to the spread of ideas” (p. 508). Similarly, examining demographic features such as race, gender, ethnicity, and socioeconomic status in a similar light may provide insight into potential solutions for the digital divide as it relates to healthcare. Barbara Wejnert (2002) argued that, “the rate of diffusion appears to be correlated with characteristics of actors' that create "objective feasibilities" of adoption of innovation” (p. 305). Leveraging all of these frameworks may indicate which factors are the most useful in predicting the adoption of technology so they can be more vigorously addressed. Despite the seemingly long lifetime of digital technology, it has yet to reach the stabilization or closure periods of its social construction as the diffusion of the technology continues and users continue to test the limits of its interpretive flexibility through applications like eHealth. The barriers to the diffusion of technology can be seen affecting the distribution of adopters below in Figure 5.

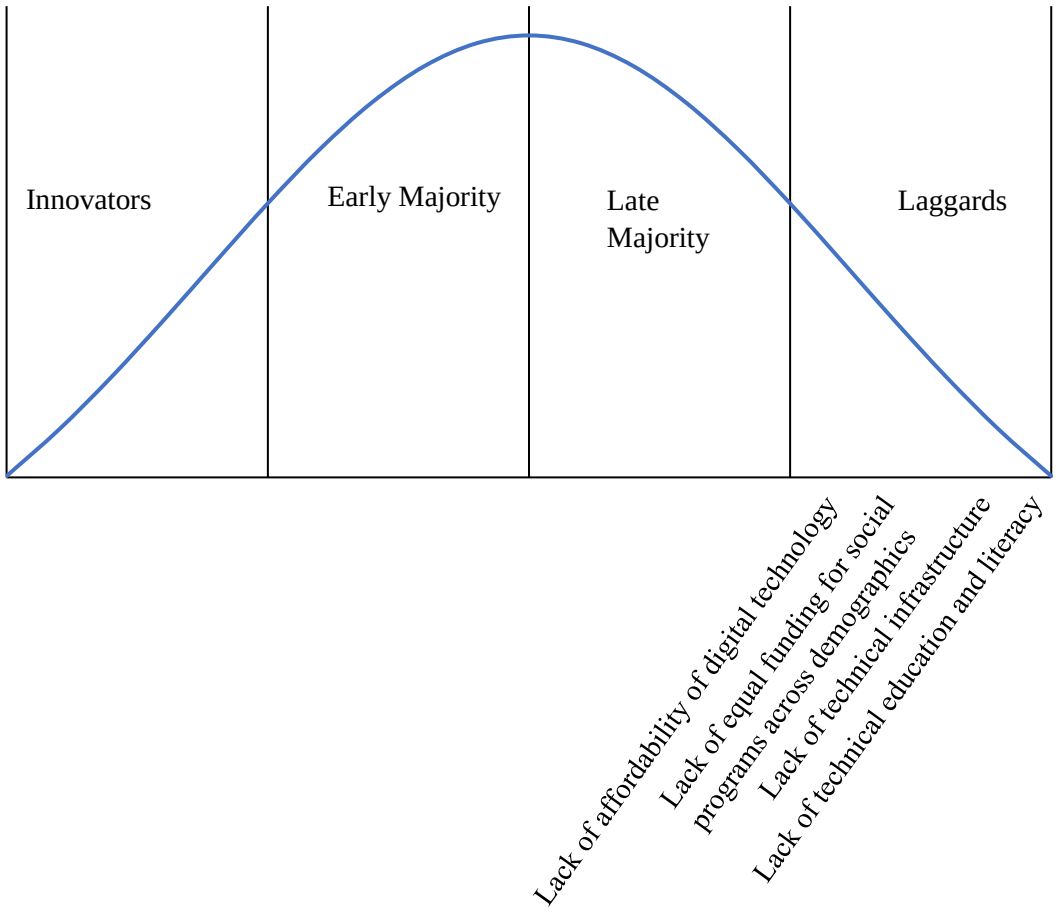

Figure 5: Barriers to the Diffusion of Digital Technology: The diffusion of digital technology is in the laggard phase and the barriers on the x axis indicate represent those faced by poor, urban communities in accessing digital technology (McGowan, 2020).

HEEDING THE UN ON MATTERS OF TECHNICAL ACCESS

The United Nations (UN) recognizes the Internet as a revolutionary development in technology and a means for people to exercise their right to freedom of expression. Article 19 of the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights declares that:

(a) Everyone shall have the right to hold opinions without interference;

> (b) Everyone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice;
> (c) The exercise of the rights provided for in paragraph 2 of this article carries with it special duties and responsibilities. It may therefore be subject to certain restrictions, but these shall only be such as are provided by law and are necessary:
> (d) for respect of the rights or reputations of others;
> (e) for the protection of national security or of public order (order public), or of public health or morals. (La Rue, 2011, p. 7)

Frank La Rue's (2011) report proposes that if the UN extrapolates from their current articles of Human Rights, then access to the Internet and digital technology should be considered an extension of the freedom to speak freely, and any restrictions on the Internet, be it government censorship, arbitrary content filtering, or access blocking should be considered infringements on that right (p. 9). Taking La Rue's argument even further, the systematic barriers that block the access of digital technology could also be perceived as a measure to silence and restrict sections of a country's population that are often too poor to pay for the Internet. When government institutions begin to acknowledge this inherent right of the people, the digital divide will cease and the diffusion of innovation can reach its final stages.

POSSIBLE POLICY SOLUTIONS TO THE DIGITAL DIVIDE'S AFFECT ON HEALTHCARE ACCESS

The proposed policy solutions to alleviating the digital divide and opening up access to healthcare in poor, urban communities are outline in the following three steps:

(i) Increasing the dependability of technological infrastructure

(ii) Including technical literacy as a part of basic education

(iii) Increasing the availability of healthcare providers

Technology Infrastructure

Some of the most useful recommendations on changes to technology infrastructure in cities is to combine the efforts of the government and private access providers to create access areas that can strengthen the community. The main component of the digital divide is a lack of public Internet access and ability to afford private Internet access. Community services could be a possible solution to this lack of private access, if they were better funded. Alternatives could include, "implementation of Wi-Fi hot spots in parks, libraries, community centers, and small businesses," which provides revitalization of the community and alleviates the pressures of the digital divide (Domine, 2010, p. 147).

One way to consider and implement policies that install and promote broadband technology networks is a hybrid method that does not include solely top-down, government-driven, or bottom up endeavors. Policy steps supporting a hybrid public technology and broadband network policy would:

1. include government intervention by way of fiscal and/or regulatory powers;
2. permit competition in local provision including ownership by governments and nonprofits;
3. acknowledge that digital inclusion and education are essential for integrating broadband into local contexts, especially in low-income and deprived areas;
4. provide latitude for a variety of ownership and business models; and
5. most fundamentally, accept that broadband is essential infrastructure—this may require the return to a national broadband strategy in Canada and the creation of such a strategy in the United States. (Tapia, Powell, & Ortiz, 209, p. 370)

While these are positive steps to make technology more available to residents in poorer communities, they alone are not adequate enough to address this issue in totality.

Technical Literacy and Education

The implementation of technical education and literacy in poor, urban school systems will allow children to access the opportunities and benefits of the Internet which can include

eHealth services. Education is an opportunity for impoverished children can become empowered and is, “strongly correlated with health” (Salgado de Snyder et. al., 2011, p.1185). When children are not given access to education or adequate education, they are experiencing a type of social exclusion that likely results in cyclical poverty in addition to poor health outcomes.

The United Nations came out with a universal set of human rights in 1948 that they declared should be protected at all costs. In Article 26 of this document, the UN (1948) states that, “everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages…Technical and professional education shall be made generally available” (p. 76). Policy changes must change to adapt to new definitions of technical education. Providing modern technical education in public schools will help alleviate some elements of the digital divide that center around technical literacy so that underprivileged individuals can access not only healthcare, but other benefits made available on the Internet such as job searching and higher educational opportunities.

Changes in curriculum and testing in public schools should better, “define a floor of core resources and provide incentives for schools to work toward professional standards of practice” (Smedley, Colburn, & Evans, 2001, p. 68). Making technology education and testing technical literacy across school systems, with special focus on poor and underserved communities will allow for the cycle of poverty and the digital divide to be interrupted. Empowering school children to learn and master technical skills will open up the Internet and all its opportunities to entire communities. If the access to this technology is applied to basic services, like healthcare, it could allow for poor, urban communities to access eHealth technologies.

Increasing the Availability of Healthcare Providers

It is also important to recognize the need for increased healthcare access so that eHealth interventions merely act as a complement to these services. Allowing nurse practitioners to practice as doctors do may help alleviate some of the load stress in urban communities and give poor, urban communities greater access to healthcare, if they do not contribute to the financial inequality already present in medicine.

Lusine Poghosyan argues that allowing nurse practitioners (NPs) to practice at the same levels as doctors is the key to providing more Americans with quality, affordable healthcare options. Poghosyan (2020) believes that NPs are the key to the future of healthcare because the population of NPs has increased 125% in the last 11 years and multiple studies have offered, "evidence [that] demonstrates that NPs offer significant cost savings with no sacrifice of quality of care. Indeed, they show that NPs often provide superior care, including spending more time with patients on prevention and counseling" (para. 5). Considering the qualifications she specifies, coupled with the increase in NPs, as opposed to the decline of internal medicine and primary care physicians, it is easy to agree that restrictions on NP's rights to practice seem to be unnecessary barriers to the delivery of much needed treatment.

To support her primary position, however, Poghosyan makes multiple assumptions that call into question the validity of her plan in providing affordable healthcare to communities in need. Poghosyan (2020) assumes that the, "Almost 60 million Americans [living] in primary care 'shortage areas'" are more populated with nurse practitioners, an assumption that is unsupported in this article (para. 8). It also fails to address the need for healthcare access beyond primary care and location discrimination. In terms of supplying communities with shortages of primary care physicians, she does not expand on whether her newly proposed regulations will change that

reality or if it will simply increase the supply of primary care providers in communities already adequately supplied. In addition, her argument relies on the assumption that allowing nurse practitioners to practice at the same level as doctors will inherently drive down the prices of healthcare, another unsubstantiated claim and one fundamental to her argument. To say that NPs will charge less for their services seems antithetical to her argument that they are just as highly trained and as a result, her expected outcomes may not come to fruition. Overall, while she proposes an innovative way to solve fundamental problems in the healthcare system, Poghosyan did not totally support her claims that allowing NPs an expanded role would drive change in terms of ease of access and affordability of healthcare services. In order for this to be a viable solution, there would need to be assurances that these new services would be made more readily available to needy and at-risk communities that currently lack adequate healthcare services.

EVALUATING POSSIBLE POLICY SOLUTIONS

In terms of the digital divide, both policies to increase broadband infrastructure and technical education in poor, urban communities are important steps. Access to healthcare, however, should not rely completely on digital access and healthcare policy should reflect this need.

The problems driven by the digital divide in poor, urban communities are nuanced in that they are intricately connected to socioeconomic status, race, and ethnicity. As a result, no single policy change will completely be able to solve the digital divide and its subsequent effects. Promoting efforts to implement actionable changes to the broadband infrastructure by government entities and private companies is a step in the right direction. Such organized change should allow for the gradual introduction of broadband technology and allow poor, urban communities to finally experience complete diffusion of technological innovation.

Though increasing the availability of broadband technology will give previously disadvantaged individuals better access, there is still an element of technical literacy that is a part of the digital divide. In order to break through the boundary object and reach technological determinism, there needs to be greater access and a greater focus on technical education in public schools in these communities.

Working to minimize the impact of the digital divide should allow poor, urban communities to experience the benefits of the Internet, which includes access to eHealth solutions. Healthcare, however, should also be an accessible service regardless of access to digital technology. Policy changes to promote an increase of physicians in poorer communities coupled with changes to technological infrastructure will hopefully allow for greater access to medical care for poor, urban residents.

It is further important to note that the proposed policy solutions described previously may be difficult to implement because of the necessary funding and legislative work. Implementing new technological infrastructure in poor, urban communities as well as changing laws surrounding medical practices would require both local funding, legislative action, and input from additional bodies and unions. Both these requirements would likely make the changes difficult and slow because they cannot be universally passed through any legislative body. Additionally, implementing technical education in schools is an important step in bridging the digital divide, it would likely require increased funding for appropriate equipment and staff in public city schools. Washington Post writer, Valerie Strauss (2018) reported that even in a high performing New York City public school in a poor region of the city, funding was cut, “upwards of $100,000 each year” (para. 16).

EXAMINING SOLUTIONS TO THE DIGITAL DIVIDE THROUGH THE SOCIAL CONSTRUCTION OF TECHNOLOGY FRAMEWORK

The problem of the digital divide can be framed with the Diffusion of Innovation theory and its potential solutions can be framed with the Social Construction of Technology theory toward reaching technological determinism. An important element of the Diffusion of Innovation theory is boundary objects. A boundary object is, "a construct that has potential to improve the uptake transfer and innovation of research findings, technology and other intellectual property across the fields of social policy, organization and management and commercial and public services" (Fox, 2011, p. 70). The boundary object in the case of the digital divide is broadband technology which would normally be used to communicate healthcare services across access gaps. In this case, however, the diffusion of innovation has stopped because of the barriers interacting with the diffusion process. The interaction between the boundary object, diffusion of innovation theory, and barriers to the spread of diffusion are represented in Figure 6 where the boundary object is digital technology to access eHealth, the thick black line represents the stoppage of

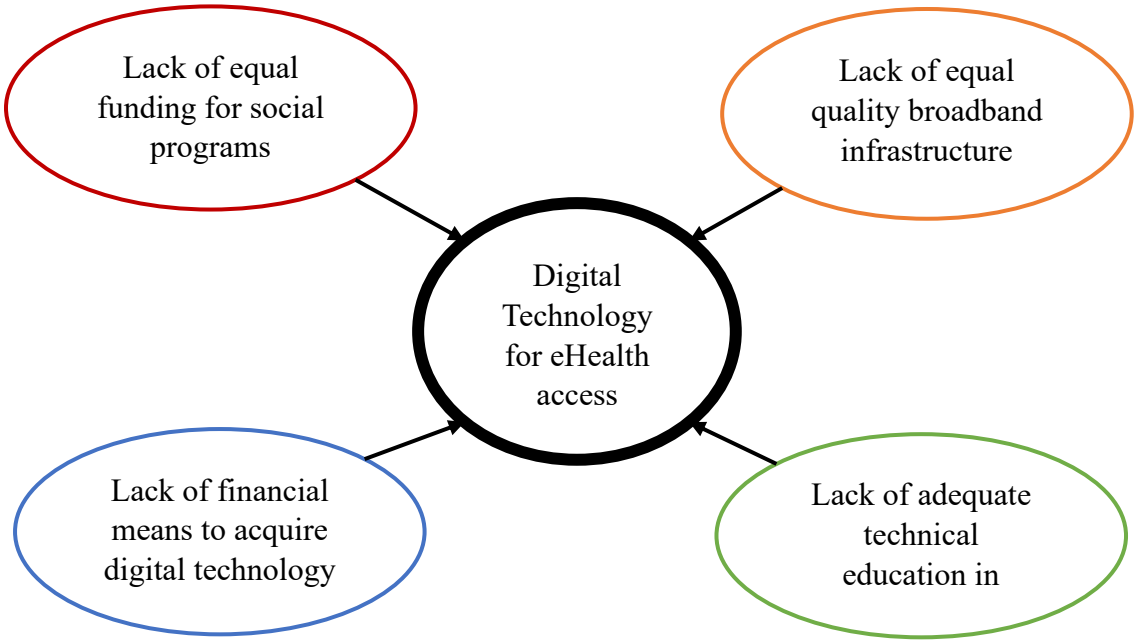

Figure 6: Stoppage of Diffusion of Digital Technology: Barriers to diffusion of digital technology for healthcare service in poor, urban communities (McGowan, 2020).

diffusion, and the barriers are on the outside, acting on the diffusion to force it to stop.

The problem of the digital divide in poor urban communities may be alleviated by the policy approaches previously discussed. From a sociotechnical perspective the solution is by further iterations of digital technology that result in it reaching its stabilization period. The Social Construction of Technology theory as posed by Pinch and Bijker (1997) is that human actions shape technology through, "an alternation of variation and selection" (p. 411).

Solving the problems of the digital divide and the barriers to diffusion of digital technology will result in technological determinism. Technological determinism can be described as the theory that technology is a key driver of social and institutional change (Brette, 2003, p. 458). In the case of the digital divide and its relationship to electronic health solutions, this appears to be true. By increasing access to digital technology and completing the diffusion of digital technology to residents of poor, urban communities could create opportunities that changes the social condition for these communities. This premise and its results are depicted in Figure 7.

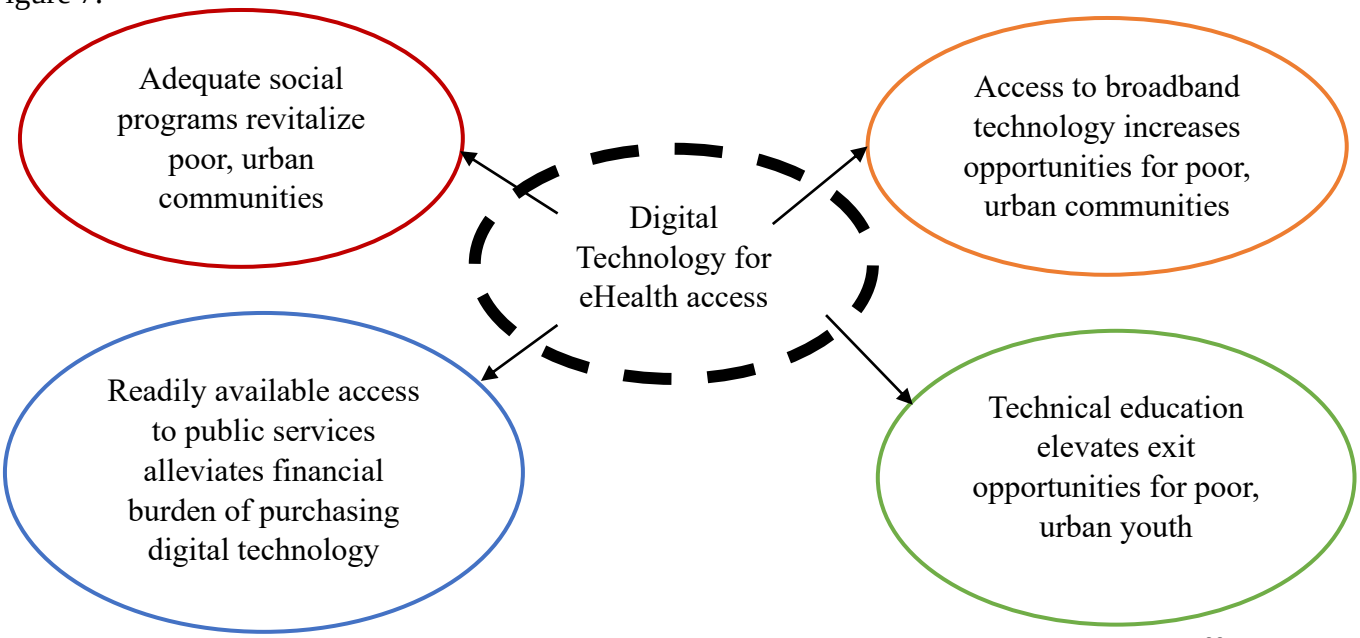

Figure 7: Reaching Technological Determinism with Digital Technology: When barriers to the diffusion of digital technology are lifted, digital technology is able to affect social change in poor, urban communities (McGowan, 2020).

With increased access and education comes increased ability for social mobility and transcending institutional barriers for poor people in the United States. While eHealth interventions are a positive contribution to increasing access to healthcare, the digital divide dictates that it cannot be equally applied. As a result, there are further public policies that will make electronic health solutions more viable and ease the strain of receiving healthcare on poor urban communities as a whole. It is important to note, however, that completing the diffusion of digital technology will not provide a solution to the underlying racial, ethnic, and socioeconomic barriers that prevent social mobility and equality in our country, but may increase the paths to it. By examining the issue of lacking healthcare access in poor urban communities, exacerbated by the digital divide through this framework will hopefully better represent the importance of considering the inequal manner in which solutions are available to different demographics. Though it is critical that society continues to propose and make available solutions to a lack of healthcare access, it is equally important to recognize the implications of these solutions and the disproportionate access that they require. This is certainly true for eHealth interventions.

Additionally, the scope of the research and proposed solutions in this thesis do not capture the totality of the healthcare crisis in the United States, nor does it completely consider all possible barriers that create unequal healthcare experiences in poor, urban communities. It is important to recognize the issues and socio-economic barriers to healthcare do not only affect urban communities. The digital divide certainly affects those in rural communities who may not have physical access and any socio-economically disadvantaged communities that may face similar barriers to those discussed in this thesis. Furthermore, healthcare access or lack thereof is an issue that affects many Americans simply by the nature of the insurance and healthcare systems in the United States. Overall, however, evidence previously laid out supports the

contention that increased access to digital technology, the implementation of technical education, and other changes to healthcare practices can increase access to both eHealth and traditional healthcare to poor, urban community residents, who have an unmet, demonstrated need for it.

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