

AN EXPLORATION INTO THE BENEFITS, CHALLENGES, AND POTENTIAL OF
TELEHEALTH IN THE UNITED STATES: A MISSISSIPPI CASE STUDY

by
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A thesis submitted to the faculty of the University of Mississippi in partial fulfillment of
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DEDICATION

To my Dad, who introduced me to the complexities of healthcare and has driven my passion to create change and provide exceptional care to all. I can only hope to be as compassionate and caring of a healthcare professional as you are.

AWKNOLEDGEMENTS

I must begin by thanking my family for driving my love for education and my passion for healthcare and supporting me in every possible way. Without the guidance of my parents, Camille and William, I would not understand the powerful opportunities that become available with hard work and dedication. I have been lucky to grow up alongside the best triplet siblings, Will and Katherine, who have fostered collaboration while still maintaining a friendly level of competition. I am lucky enough to have two built-in best friends who share similar interests in healthcare and constantly support me in my endeavors.

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ABSTRACT

ANN WESTON SISTRUNK: An Exploration into the Benefits, Challenges, and Potential
of Telehealth in the United States: A Mississippi Case Study
(Under the direction of Dr. David J. Rutherford)

Healthcare in the United States is in need of new solutions to provide access to care for all and decrease the rising costs of care. Telehealth is a developing model of healthcare delivery, and it will provide effective and equitable solutions to increase access to healthcare across the nation. As models of healthcare rapidly change, telehealth will continue to progress, but it is necessary for policy to complement the rapidly changing healthcare environment so that telehealth implementation can be successful. Along with access, telehealth has the opportunity to address many convenience barriers to healthcare, including distribution and number of practitioners, location barriers, and appointment availability. This thesis provides an exploratory literature review of the background, benefits, challenges, and potential of telehealth in the United States and provides original research into telehealth in Mississippi.

Mississippi is a unique state when it comes to healthcare, and it is a leader in telehealth across the nation. The goal of this original research is to explore healthcare in Mississippi and learn from healthcare administrators about the healthcare needs in Mississippi and how telehealth can provide solutions to current health barriers. The research was gathered through semi-structured interviews of healthcare administrators from three different sites in Mississippi, ranging from a rural wellness center to the

largest telehealth center in the state. After completion of the interviews, the interview data were recorded in the form of notes and a synthesis document was drafted explaining the common themes of telehealth in Mississippi.

The results of the research were comparable to literature review; there was an emphasis on barriers to telehealth implementation such as reimbursement and health policy. Another commonality was that health systems and practitioners generally want to use telehealth services, but there currently are too many barriers to successful telehealth implementation for it to be a sustainable model. In order for telehealth to be successfully implemented, there needs to be more research, lobbying, and advocacy efforts to make prompt and effective change in health policies in the United States.

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LIST OF ABBREVIATIONS

AMA	American Medical Association
ATA	American Telehealth Association
ACA	Affordable Care Act
CMS	Centers for Medicare and Medicaid Services
HIPAA	Health Insurance Portability and Accountability Act
HITECH	Health Information Technology for Economic and Clinical Health Act
UMMC	University of Mississippi Medical Center
WHO	World Health Organization
CIRM	International Radio Medical Center
ACO	Accountable Care Organization
EMRs	Electronic Medical Records
RPM	Remote Patient Monitoring

CHAPTER I: APPROACHING THE STUDY OF TELEHEALTH

Introduction

According to the World Health Organization (2016), access to high-quality healthcare for all is one of the great challenges facing humankind in the 21st century. The difficulty in achieving equitable access to healthcare has been that the patient and provider must be present in the same room at the same time, but advancements in communication and medical technologies have created opportunities for new methods of healthcare delivery. (Craig and Patterson 2005). Telehealth is increasingly seen as important in the future of healthcare as a tool for enhancing healthcare delivery practices. It promises to be a solution to many barriers to healthcare such as access issues and cost of care, particularly in rural and underserved areas where healthcare and health professionals are not abundant and sometimes non-existent (Pong & Hogenbirk 2000). As the world moves towards a more technological and sustainable future, telehealth will be a common healthcare delivery method to address the many health needs, especially in the United States. In order to better understand telehealth and its implications on healthcare in the United States, this thesis contributes understanding of the specific needs of individual states and how telehealth can better address healthcare disparities.

Telehealth offers a cost-effective way to link doctors to patients and allows physicians to monitor medical conditions and consult with specialists all while overcoming time and distance. Although our world has seen numerous advances in technology such as mobile devices and computers, advocates of telehealth say that

telehealth has and will continue to find it challenging to reach its full potential due to policies and procedures that make it difficult to initiate and pay for this type of care (Ollove 2015). Increased access to specialist expertise and the avoidance of travel to receive those services whether by the patient or the provider are major benefits to telehealth, especially in rural populations. In areas such as these where there is a limited amount of medical resources, telehealth can be a valuable asset for patients to access equitable health care. According to the World Health Organization, telehealth could be a key component of providing universal coverage in the future (WHO 2016).

Defining Telehealth

In 1996, the Institutes of Medicine released a report entitled *Telemedicine: A Guide to Assessing Telecommunications for Health Care*. In this report, the Institutes of Medicine published that “telemedicine is not a single technology or a discrete set or related technologies; it is, rather, a large and very heterogeneous collection of clinical practices, technologies and organizational arrangements.” They also concluded that “the adoption of effective telehealth practices depends on a complex, but broadly distributed technical and human infrastructure that currently is only partially in place and is profoundly affected by rapid changes in healthcare, information, and communications systems (Lusting 2012, 14).” Telehealth is an increasingly complex subject with no clear definition and no systematic implementation method.

Telehealth is when medicine, information, and telecommunications technology intersect, and this transformative connection can greatly impact healthcare delivery (Craig and Patterson 2005). Currently, there is no uniform definition for telehealth or consistent terminology associated with telehealth delivery methods. In its simplest form,

telehealth, with the prefix “tele” meaning “at a distance,” is the delivery of healthcare and the exchange of health information across distances using technology. This simple definition encompasses a wide range of telehealth activities, including diagnosis, treatment, prevention, education, and research (Craig and Patterson 2005). The Health Resources and Services Administration defines telehealth as “the use of electronic information and telecommunication technologies to support and promote long-distance clinical health care, patient and professional health-related education, public health, and health administration (Halstater ND).” Telehealth is not a specific service, but a collection of means to enhance care and education, and delivery methods (Halstater ND). Telehealth is a widely-defined but interchangeable term, which makes the definition of telehealth specific to the use or descriptor.

To provide a wide definition of remote healthcare, telehealth is often interchanged with the term telemedicine. Dr. Thomas Nesbitt of the University of California at Davis explains that while the terms telehealth and telemedicine both describe the use of technology to exchange information to improve patient health, they are often interchanged. But there is a difference. Telemedicine is often used to describe direct clinical services and telehealth is used to define a broader scope of services such as patient education and remote patient monitoring (Lustig). Telemedicine is often used for physician and clinical services, but for the purposes of this thesis, the term telehealth will be used to describe all aspects of telehealth and telemedicine. Telehealth is the remote delivery of healthcare services and clinical information using telecommunications technology and includes the transfer of health information and clinical services using internet, wireless technology, satellites, radio and telephones (American Telemedicine

Association 2018). Although there are many types of telehealth described using words like telemedicine, telecare, and eHealth, all of these similar words can be put under the umbrella of telehealth, because they all involve the transfer of information about health between one or more sites, so that the health of individuals and communities can be better addressed (Craig and Patterson 2005). A diagram showing the relationship between telehealth terms are shown in Figure 1.

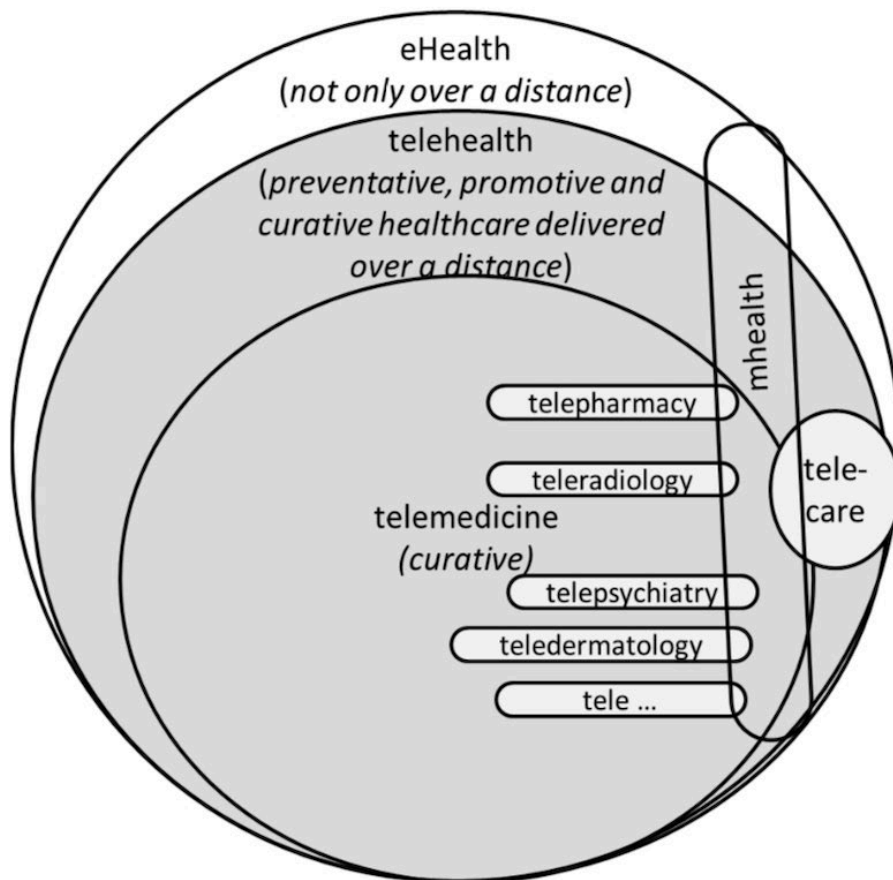


Figure 1: Telemedicine, eHealth, Telehealth, Telecare, and mHealth (Van Dyk 2014)

Telehealth has also been defined as medical information that is exchanged from one site to another using electronic means such as audiovisual and electronic tools to improve a patient's health (Edmunds et al. 2017). According to the World Health

Organization's report on e-Health Universal Coverage, the practice of telehealth medicine between a healthcare provider and patient at a distance is a practical and cost-effective delivery method (WHO 2016). Because the health-setting interaction can take place in real time through a phone or video feed, or asynchronously when a request is submitted and later answered by a healthcare professional, telehealth improves access to healthcare increases the speed of access and reduces costs (WHO 2016). As computer and smartphone device usage increases among patients, telehealth delivery will become more common in healthcare.

Healthcare providers in rural areas have reported cost savings when implementing telehealth programs. These savings include less patient and practitioner travel, reduced readmissions, and time savings (Elder 2013). In 2012, the American Rural Health Association reported that participants in their telehealth program saved, on average, \$6,500 compared to patients who did not participate. They also estimated that in 2012, the cost of treating a patient with telehealth was \$1,600 per year versus \$13,000 a year for traditional healthcare delivery methods provided by Veterans Health Administration hospitals. For rural patients and patients utilizing VA hospitals, the benefits of telehealth prove to be overwhelming when distance, travel, and income are common barriers (Allen et al. 2017).

Nationally

Telehealth is a rapidly growing and significant development of healthcare in the United States. Millions of patients around the world use telehealth to monitor vital signs to remain healthy and out of hospitals. The American Telemedicine Association estimates that there are 200 telehealth networks with 3,500 service sites in the United States, and

that nearly 1 million Americans are using remote patient monitoring programs for cardiac monitors. They also estimate that in 2011, the Veterans Health Administration utilized telecommunications for over 300,000 remote consultations and that over half of all United States hospitals use some form of telehealth (The American Telemedicine Association 2018).

Telehealth technology, tools, and services are quickly becoming an important part of the health care system. The Department of Health and Human Services estimates that “more than 60 percent of all healthcare institutions and 40 to 50 percent of all hospitals in the United States currently use some form of Telehealth (Edmunds et al. 2017, 1585).” Telehealth is also one of the fastest-growing sectors in the healthcare field. According to the same report by the Department of Health and Human Services, the telehealth market generated 9.6 billion dollars in revenue in 2013 which was a 60 percent increase in growth from the previous year (Edmunds et al. 2017).

Internationally

Most developed telemedicine services that offer clinical management and diagnosis at a distance are in industrialized countries such as the United States, Canada, Australia, and the United Kingdom. According to a report on United States telehealth activity completed in 2004, over 85,000 teleconsultations by more than 200 telehealth programs were completed in 2002. They also reported that mental health, pediatrics, dermatology, cardiology, and orthopedics accounted for almost 60 percent of those teleconsultations. The survey also identified 52 telehealth programs outside of the United States, with Canada, Australia, and the United Kingdom having the most programs in descending order. There are linked telehealth programs in other continents such as Africa,

for example networks in South Africa and in Mali that are linked to hospitals in Geneva, Switzerland. This area of network sharing between countries is likely to grow in the future to provide access to healthcare globally, especially in areas where there are health deserts such as small villages in Africa and South America (Craig and Patterson 2005). Figure 2 shows the distribution of geographic locations of where research on telehealth is being published across the globe.

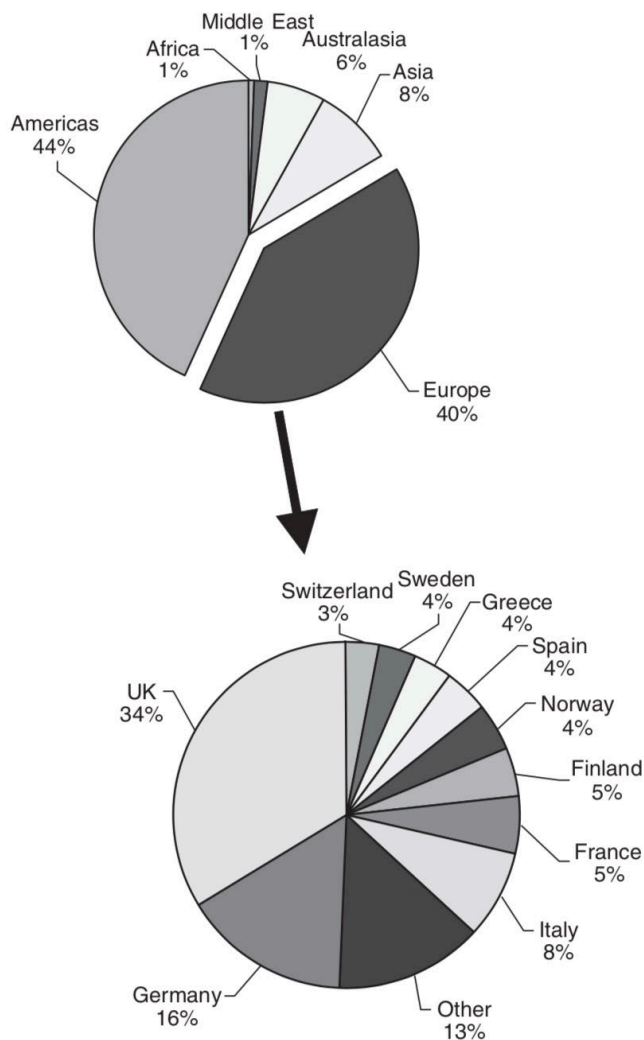


Figure 3 Primary telemedicine research – origin of the research papers published in the two specialist telemedicine journals (*Telemedicine Journal and e-Health* and *Journal of Telemedicine and Telecare*) from 1998–2003 (n = 2952)

Figure 2: Geographic Distribution of Telehealth Research (Craig and Patterson 2005)

Mississippi

Mississippi has become a leader in telehealth across the nation due to its unique healthcare situation. Mississippi has a rare combination of social determinants and general problems with access to care that produce barriers to healthcare due to its rural nature, poverty, food insecurity, and education rates, but telehealth has provided solutions that have proved to be successful (deShazo and Parker, 2017). The University of Mississippi Medical Center's (UMMC 2019) Center for Telehealth has been a model for other telehealth programs across the nation, including The Mayo Clinic in Rochester, Minnesota.

Mississippi has unique healthcare needs in comparison to other states in the United States and those unique needs can be attributed to poverty, education, limited medical centers and healthcare practitioners, and an extensive rural population. Mississippi is ranked 51st in poverty and in hunger and food insecurity with 20.8 percent of Mississippians living below the poverty line, and more than 50 percent of Mississippians live in rural areas. It is estimated that more than 70 percent of the low-income population in the rural Delta area of Mississippi have to travel more than 30 miles to access healthy foods in supermarkets (UMMC 2019). This creates unique battles and barriers in healthcare. Food insecurity and hunger can lead to health problems such as lack of nutrition, obesity, and chronic illnesses such as diabetes, and access to healthcare is burdened even more by poverty and extensive rural populations who do not have access to transportation or travel expenses to receive medical care (UMMC 2019).

Mississippi is also unique in that it has extreme rates of chronic illness that burden health systems and access to healthcare in the state. Over 15.4 percent of the adult

population in Mississippi has diabetes, and this accounts for over 20 percent of healthcare spending in the state. Kidney disease is also an extremely common chronic illness that requires extensive medical care and monitoring, and much of the Medicaid spending in Mississippi is used for dialysis of kidney disease patients. Matched by a shortage of healthcare professionals with Mississippi ranked 49th for primary care physicians, there are major problems associated with access to healthcare in Mississippi (UMMC 2019).

These barriers to healthcare in Mississippi have allowed the UMMC Center for Telehealth to excel in creating programs and policies that increase access to healthcare for all Mississippians. The University of Mississippi Medical Center was established in 1955 and is Mississippi's only academic medical center. The Center for Telehealth at UMMC began in 2013 and allows healthcare providers to examine and treat patients remotely, in real time, using online streaming video technology and interactive tools. UMMC first began using telehealth in its Emergency Room via videoconferencing in 2003, and in 2008, a telepsychiatry program began to take shape. In 2011, the University assigned full-time staff to telehealth, which allowed the Center for Telehealth to form in 2013 along with its 24/7 telehealth call center. UMMC Telehealth offers more than 35 kinds of specialty care through its programs, including emergency services, pediatrics, urgent care, and many other specialties that are often not available in rural communities. In summary, the UMMC Center for Telehealth provides specialty care that is convenient for patients, offers vital support for primary care physicians, helps decrease the cost of care and improve patient outcomes, and supports population health in underserved communities in Mississippi (UMMC 2019).

Although there are other telehealth companies and health systems with their own programs, the Telehealth Center at the University of Mississippi Medical Center is the most prominent and extensive telehealth center in the state of Mississippi, and provides many hospitals, health systems, private companies, and schools with telehealth resources. For example, Mississippi State University and a few community colleges around the state utilize telehealth services provided by UMMC in their student health centers (UMMC 2019). Figure 3 provides a list of telehealth providers currently operating in Mississippi as of April 2017.

Table 3 Telehealth Providers Presently Operating in Mississippi
24/7 Dr. Help
American Wel
ClickMedix
Doctor on Demand
E-Psychiatry
First Stop Health
FlexCare
HealthTap
InSight Telepsychiatry
LiveHealth Online
MDLive
Memorial Hospital at Gulfport
My Dr. Now
North Mississippi Medical Center
Specialists on Call
St. Dominic Hospital
Teladoc
TelehealthONE
University of Mississippi Medical Center – Center for Telehealth
WorldClinic

Courtesy of Michael Adcock, MBA, University of Mississippi Medical Center for Telehealth (madcock@umc.edu).

Figure 3: Telehealth Providers in Mississippi (deShazo and Parker, 2017)

Backed by clinical practice guidelines, clinical standards, and research, telehealth is a safe a cost-effective way to extend the delivery of healthcare to all, especially in a state like Mississippi (The American Telemedicine Association 2018). To access

telehealth services, patients can ask their physician or physicians can provide information about telehealth services that are already available such as remote patient monitoring programs. There are also private companies that provide telehealth services such as urgent care, medication adherence programs, and education (The American Telemedicine Association 2018). Although there are research and guidelines on telehealth, more research is needed to provide hospitals, health systems, and policymakers a guide to better health delivery and overcome health barriers through telehealth.

Research Process

The study of telehealth is a new and emerging field, and my process to study it was similar. I first learned about telehealth while completing a fellowship at the University of Mississippi Medical Center in the Summer of 2017. The Frate Fellowship in Bioethics and Medical Humanities was an opportunity for undergraduate students in Mississippi to gain exposure to the broad spectrum of ethical, social, and cultural issues associated with modern healthcare. I first learned about the telehealth field through this fellowship, and began working with Michael Adcock, the Director of the Center for Telehealth at UMMC. As a fellow, I completed rotations in multiple areas of the hospital and around the state, including pediatric palliative care, Mississippi State mental health facility, Institutional Review Board, animal research laboratories, neonatal intensive care unit, the Jackson Heart Study, operating rooms, spiritual services, Mississippi organ recovery agency, the telehealth center, and hospital leadership. After these rotations, my fellowship culminated with research targeted to a rotation of interest and a final project to present to UMMC faculty and staff. The UMMC Center for Telehealth became my area of choice, and I reported on the ethics of telehealth delivery at colleges and universities in

Mississippi. This project led me to pursue my undergraduate honors thesis research on telehealth in Mississippi, specifically healthcare disparities in Mississippi that can be better addressed through telehealth. The topic of telehealth, but more specifically telehealth on college campuses, became an interest of mine following that fellowship, and that is how telehealth came to be my research topic for this thesis. But, as in many long research projects, my interests changed slightly.

Following the fellowship, I began working with my thesis advisor, Dr. David Rutherford in the Department of Public Policy Leadership at the University of Mississippi in the Spring of 2018. Continuing my interests of telehealth and specifically, telehealth at colleges and universities, I began exploring the field of telehealth and the opportunities for thesis research. I first proposed a case-study format for original research into successful models for telehealth implementation at colleges and universities in the United States. This would require extensive research into programs implemented throughout the United States, and specifically in a higher-education setting, which proved to be a difficult endeavor and too much for an undergraduate thesis.

I then learned about an experience through the Sally McDonnell Barksdale Honors College to participate in a course on experiential learning in telehealth through my Public Policy Leadership professor, Dr. Nihdi Vij Mali. Knowing my interests in telehealth, Dr. Vij reached out to me after class in the Spring 2018 and encouraged me to take Dr. Kate McGurn Centellas' telehealth research course, as she had worked with Dr. Centellas in the past on research. At first, I was not interested in taking the course, as I believed I had secured my thesis topic of interest, but then I came to the realization that

this course could open me up to the telehealth field in Mississippi and allow for my own original research, which is something I did not originally plan on for my thesis work.

The Honors Experiential Learning in Telehealth course helped to secure my final thesis topic and allowed me to conduct original research alongside Dr. Kate Centellas. The course introduced me to telehealth topics specific to Mississippi and allowed me to understand how telehealth can better health outcomes in Mississippi. I also began to realize that telehealth in Mississippi is very complicated due to many barriers such as ineffective policies and reimbursement, and more research is required to lift those barriers to make telehealth effective. This realization led me to change my topic and focus on healthcare needs in Mississippi and how telehealth can increase access to healthcare.

CHAPTER II: UNDERSTANDING TELEHEALTH

Background

Most advancements in telehealth have clearly begun in the last thirty years in line with advancements in technology and telecommunications. Before technology even existed, healthcare delivery at a distance existed, but true telehealth delivery using telecommunications began after the invention of the radio and telephone. Beginning in the mid-1800s, telegraphy became an important tool for health information delivery. Telegraphy used signals through wires, and was quickly developed by those providing medical care, particularly for use during the American Civil War to transmit casualty lists and order medical supplies. Later technologies allowed for advancements in x-ray imaging and other telehealth services. Following the telegraph, advancements in the telephone and radio as a means of communication allowed for changes in healthcare delivery (Craig and Patterson 2005).

Telehealth in a home-based setting was first documented in the long history of an 1879 article published by *The Lancet*. The author talks about using the telephone to reduce unnecessary doctor's office visits (Lustig 2012). But before this could become a reality, telecommunications needed to be available. The telecommunications field began to soar with the invention of a practical telephone by Alexander Graham Bell in 1876 (Iafolla 2019). Following this crucial telecommunications step, many health practitioners in as early as 1910 began to realize that the telephone could be used for purposes other than voice communications. Practitioners began to use the telephone to amplify sounds

from a stethoscope and then transmit those sounds through the telephone network to a physician (Craig and Patterson 2005). Although the telephone provided transformative advancements in telehealth, the radio remained an effective, reliable, and trusted method of telehealth delivery for much of the 20th century.

When the radio began producing voice transmissions in addition to its usual Morse code, many groups began to take advantage of the usefulness of voice transmission. In 1920, the Seaman's Church Institute of New York became one of those groups and used the radio to provide medical care to sailors aboard vessels across the ocean. Other maritime nations followed this example, and in 1935 the International Radio Medical Center (CIRM) was founded in Rome, Italy to provide healthcare to seafarers. The CIRM assisted with over 42,000 patients in its first sixty years, which made it the largest organization to use telehealth at the time. The radio is still used today for telehealth, particularly in travel during in-flight medical incidents that require medical assistance (Craig and Patterson 2005).

With the invention of the telephone and radio, inventors became interested in a new tool that could help medical practitioners better deliver healthcare. Dr. Hugo Gernsback began envisioning advances in medicine with the help of telecommunications in 1924. He envisioned a tool called the tele dactyl, a medical instrument with robotic fingers and a projected video feed to examine patients from afar (Iafolla 2019). These fantasies also made the headlines of major magazines when a photograph on the cover of Science and Invention Magazine in 1925 showed a doctor diagnosing a patient by radio and described the future goal of a device that would allow for the video examination of a patient over distance (Lustig 2012). But this idea was merely a fantasy at that time, until

the 1950s when medical personnel began doing experiments with closed-circuit televisions (Iafolla 2019).

One of the early famous cases of clinical telehealth was in the late 1950s and early 1960s when a closed-circuit television link was established between two healthcare facilities for psychiatric consultations (Lustig 2012). Beginning in 1959, Nebraska Psychiatric Institute in Omaha, Nebraska and the Norfolk State Hospital created the first video link to provide psychiatric medical care to patients in each facility (Iafolla 2019). The system allowed for interactive consultations between specialists and general practitioners as well as facilitated education and training at both sites (Craig and Patterson 2005). After this case, hospital-based telehealth grew to other specialties in the hospital, including in the Intensive Care Unit and in Emergency Rooms (Lustig 2012). Today, with access to high-speed mobile networks and better video technology, Emergency Medical Service providers use telehealth more extensively in communications with medical personnel and in the Emergency Room itself (Qiu and Joshi, 2017).

Shortly after the first hospital-based telehealth case, the telecommunications field experienced another groundbreaking advancement of color television in the 1960s. During this time, the National Aeronautics and Space Administration (NASA) directly and indirectly made large advancements in the telehealth industry. NASA brought innovation and progress to the telehealth field in the 1960s and 1970s when they used telehealth to provide healthcare to astronauts in space and also funded telehealth projects around the country. The projects funded by NASA provided real solutions in healthcare, and the United States government began applying telehealth to areas with limited

healthcare practitioners and limited access to adequate healthcare, particularly in rural areas of the United States. The Space Age pushed money into the telehealth field, allowing the industry to boom even further, and these advances helped influence the Centers for Medicaid and Medicare Services (CMS) to start reimbursing for telemedicine services in rural areas in 1999 (Iafolla 2019). After this change in policy, Medicare has routinely added new reimbursement codes for telehealth every year, and as of October 2017, forty-eight states and the District of Columbia offer some type of telehealth services (Allen et al. 2017).

In 1967, Boston Logan Airport and Massachusetts General Hospital were linked using a two-way audiovisual microwave circuit by a new telecommunications system that paired paraprofessionals to physician-patient encounters (Iafolla 2019). The connection between Massachusetts General Hospital and the Logan Airport Medical Station allowed passengers and airport employees to receive medical care 24 hours a day by medical practitioners in the hospital (Craig and Patterson 2005). Dr. Jay Sanders is referred to as the “Father of Telemedicine” in the United States for his participation in this effort during his residency with Massachusetts General Hospital and is the founding board member of the American Telemedicine Association. Dr. Sanders also served on the NASA Biological and Physical Research Advisory Committee during the time of telehealth growth across the nation (Allen et al. 2017). This growth brought in funding from the federal government in the 1970s to provide a range of telehealth programs to improve healthcare access in rural areas (Iafolla 2019).

Again from 1972 to 1975, NASA improved telehealth through a partnership with the Indian Health Services to deliver remote healthcare to the Papago Indian Reservation

in Arizona, where they provided x-ray machines and submitted those results to the nearby hospital where radiologists could receive the film and provide a quick diagnosis. NASA also paired with SCI Systems in Houston, Texas to test video requirements for remote medical diagnosis technology. NASA again broke boundaries in telehealth when they organized the first international telehealth project of a Space Bridge to Armenia to offer medical support after an earthquake in 1989 (Iafolla 2019).

The year 1989 became a pivotal year for technology in general with the invention of the world-wide web, which expanded the capabilities of telemedicine and allowed for groups to mobilize around telehealth. In 1993, the American Telemedicine Association formed to push for more resources, standards, and legislation for telemedicine, and in 1999, the Centers for Medicaid and Medicare Services began paying for telehealth consultations for patients who live in underserved rural areas. The American Recovery and Reinvestment Act of 2009 also helped stimulate the telehealth sector through health information technology and brought rapid expansion to telehealth in the United States. Patients and providers began to realize that telehealth could improve healthcare costs and provide more convenient care for patients (Iafolla 2019). The American Recovery and Reinvestment Act of 2009 and the Affordable Care Act of 2010 together increased federal spending on health information technology and telehealth (Ollove 2015).

More recently in 2015, healthcare began to mobilize via smartphones and tablets, and the Pew Research Center reported that as many as two of three Americans own a smartphone and use their phone to research medical information or to access other health tools. By 2020, it is projected that the telemedicine field will be a 34-billion-dollar industry and a key player in healthcare delivery worldwide (Iafolla 2019).

Categories

Telehealth is a very broad term that can encompass all services and systems of healthcare that use electronics or telecommunications to deliver healthcare to patients (Craig and Patterson 2005). The term “telehealth” incorporates not only technologies that fall under “telemedicine,” but also direct electronic patient to provider interactions and the use of medical devices, including smartphone applications, activity trackers, and blood glucose monitors, to collect and transmit health information with the intent to monitor or manage disease and illnesses (Office of Health Policy 2016). This can make defining and organizing telehealth and its services very complicated, but there are some commonalities in telehealth services that allows categories of telehealth to be formed. In order to classify telehealth services, telehealth can be organized into larger common categories and common applications (Craig and Patterson 2005).

Interaction Categories

The commonality for all telehealth services is that a patient or consumer of some kind obtains an opinion from someone with expertise in the healthcare field when the parties are separated by distance or space. On a basic level, telehealth services can be classified on the basis of an interaction between the patient and the practitioner and the type of information being transmitted (Craig and Patterson 2005). There are currently four broad categories of telehealth on the basis of interaction between the patient and practitioner: synchronous, asynchronous, remote patient monitoring, and mobile health (Office of Health Policy 2016). The two largest categories based on type of interaction are asynchronous, also known as prerecorded or store-and-forward, and synchronous, or in real time (Craig and Patterson 2005).

Synchronous telehealth is a live two-way interaction between a patient and provider using audiovisual telecommunications. Before companies such as Teladoc and LiveHealth Online began linking patients directly to providers via video link, synchronous videoconferences were often exclusively provider to provider interactions (Office of Health Policy 2016). For synchronous, or real time interactions between patient and provider, there is no delay in giving and receiving the patient information, and these interactions are often interactive via videoconferencing. To go back to the second large theme of telehealth, the information or data transmitted between two asynchronous sites can take many forms, such as text, audio, images, and video. Combining the type of interaction and the type of information allows for classification of telehealth services into smaller categories (Craig and Patterson 2005).

Asynchronous telehealth provides access to data after they have been collected and transmits videos or digital images such as x-rays and photos through a secure electronic medical communications system. Asynchronous telehealth takes diagnostic information directly from the patient, such as x-rays or CT scans, and then sends the data to specialists in another location (Office of Health Policy 2016). When the telehealth service is prerecorded, information or data from the patient is obtained and then stored before being sent for expert interpretation at a later time or date. For asynchronous telehealth, email is a common method used to store and forward patient data to allow practitioners to easily receive the data and provide a diagnosis or consultation (Craig and Patterson 2005). This category of telehealth is often referred to as “store and forward” due to the delay between the time an image is collected and when it is read by a medical professional (Office of Health Policy 2016).

Remote Patient Monitoring (RPM), began with the National Aeronautics and Space Administration's Mercury Space Program where the psychology and physical health of astronauts were monitored over a distance (Lustig 2012). RPM is a category of telehealth primarily used for patients to monitor chronic illnesses and for practitioners to educate patients on how to monitor and control their disease. Remote Patient Monitoring is when personal health and medical data are collected from a patient in one location, usually their home, and then transmitted to a provider in a different location. RPM is used primarily for chronic disease management and uses monitors to transmit vital signs such as blood pressure, blood oxygen levels, glucose levels, and other information to medical professionals to monitor (Office of Health Policy 2016).

Mobile health is the newest category of telehealth with the invention and advancement of smartphones. Smartphone applications are very useful in telehealth implementation, and there are healthcare applications today that are designed to educate patients on health and well-being. These applications range from programs that send targeted text-messages to encourage healthy behavior, alerts about outbreaks, and programs that help remind patients to adhere to healthy lifestyles or medication regimens. Smartphones are becoming increasingly important in telehealth, as they can be used for cameras, microphones, or sensors to conduct video consultations, capture vital signs, or integrating RPM programs (Office of Health Policy 2016).

Telehealth can be used in a variety of settings as long as technology is available and that applicable legal and policy requirements are met. Approved telehealth origination sites include clinics, community mental health clinics, dental offices, federally qualified health centers, homes, hospitals, neurodevelopmental centers,

physician's office, rural health clinics, schools, and skilled nursing facilities. Telehealth services are also commonly combined with in-person visits, usually in the form of follow-up visits or testing results (Luxton 2017).

Telehealth Applications

Telehealth applications can be divided into two broad categories: clinical and nonclinical. Clinical applications include clinical treatments such as clinical assessments and testing, transmission of health data, clinical consultations with other professionals, case management, and clinical supervision of professional trainees (Luxton 2017). Clinical applications of telehealth have a particularly beneficial impact on all areas of patient care, particularly in the health setting, such as diagnostic, treatment, and monitoring services. Clinical applications can be provided synchronously or asynchronously and range from the telephone to fax machines, email, discussion boards, and videoconferencing. The choice of technology and mode of telehealth transmission used in clinical applications largely depends on the limitations of the setting, the needs of the patient, and the preferences of the practitioner (Allen et al. 2001). Clinical applications of telehealth are often in the form of administrative tasks that include the recording and sharing of billing summaries, electronic connections to pharmacies for prescriptions ordering, checking medical records for inconsistencies, and public health record keeping and administration (Allen et al. 2001). Telehealth can be quite beneficial to the field of healthcare administration, where technology can streamline many administrative tasks and allows for easier fusion of telehealth services and billing, just to name an example.

Telehealth has historically been used in clinical settings. In 1906, the inventor of the electrocardiogram published a paper on the tele-cardiogram. Since the 1920s, the radio has been used to give medical advice to clinics on ships. Rural states like Alaska have been a model for the development of telehealth. For example, community health practitioners in small, rural communities can perform procedures like otoscopy and audiometry, and the data can be sent to specialists in larger cities to make a diagnosis and determine if the patient needs to travel to see the specialist for treatment. Since the 1990s, studies have shown high rates of agreement between diagnoses made in person and diagnoses made via telehealth. Telehealth equipment will continue to evolve as technology evolves, and there will be more integration of telehealth into clinical settings, including electronic medical records (Lustig 2012).

Nonclinical applications of telehealth include training, distance learning, continuing education, administrative collaboration between providers via meetings or presentations, research, and quality improvement (Luxton 2017). Remote Patient Monitoring is an important nonclinical telehealth application. Remote medical instruments make nonclinical telehealth applications possible. Remote medical instruments include various types of imaging technologies, pressure sensors, haptic feedback devices such as smart watches, and robotics used in special applications such as telesurgery. Remote patient monitoring devices allow medical care to extend outside of the clinical healthcare setting, which is a huge advancement for the healthcare field. Common medical instruments used by telehealth patients on a daily basis include remote blood pressure cuffs, thermometers, and portable EKG units with plug-ins for computer transmission of reports to a professional staff (Allen et al. 2001).

Along with remote healthcare applications, educational applications to telehealth are becoming a large part of nonclinical work to better health and teach preventative medicine. These non-clinical resources are also providing much needed resources to practitioners in the field. Educational applications of telehealth include continuing medical education for professionals, educational resources for patients, and self-monitoring devices for patients to help manage their own disease (Allen et al. 2001).

Telehealth Programs

Finally, to further introduce and explain telehealth, there are a few common types of telehealth programs that can be broadly defined to encompass many different telehealth programming. The categories for types of telehealth programs are primary care, specialty care, behavioral health, and school-based programs. Primary care programs are generally direct patient to practitioner contact such as consultations or urgent care, while specialty care programs consist of tele neurology and tele trauma that allow patients to see specialty providers in a timely manner without having to travel to see the practitioner. Behavioral and mental health programs can encompass psychological evaluations in the Emergency Room to mental health programming, to telecounseling, which is very beneficial in places where mental health services are scarce. School-based telehealth programs are becoming increasingly more common as schools are now a reimbursable origination site for telehealth. School-based programs allow children to be seen by a physician or nurse during the school day, which allows students who are otherwise unable to go to the clinic or hospital to receive care. School-based programs also take a burden off of parents, who may normally have to take off work or forgo other obligations to take their child to the doctor. School-based programs do not just exist in

primary and secondary schools, but also in higher education. More colleges and universities are providing telehealth services to students to better preventative health, educate patients, and provide services such as urgent care and mental health care (Allen et al. 2017).

In summary, several decades of telehealth experimentation combined with advancements in telecommunication technology has created an increasingly integrated system of synchronous and asynchronous technologies that are designed to deliver optimal to patients at any time. With telehealth, it is a fact that physicians no longer have to leave their practice, home, or office to provide health services to patients in remote areas. Technology has had a profound effect on many aspects of the health care system (Allen et al. 2001).

CHAPTER III: POTENTIAL OF TELEHEALTH

Telehealth is a reality, and many believe that the answer to issues of cost and access to healthcare is in telehealth. Telehealth has the potential to increase access to care while lowering costs and providing convenient treatment options for patients (Yang 2016).

Current Trends

There are a variety of trends that are currently shaping telehealth across the nation. The emerging trends in telehealth can be organized into three broad categories: the applications of telehealth, the expansion of telehealth, and the migration of telehealth. Applications of telehealth can be further broken down into access to care, convenience of care, and cost of care. One of the fundamental aims of telehealth is to increase access to healthcare. Current telehealth measures have successfully increased access to healthcare for populations for which care was otherwise not available. Early applications of telehealth were aimed at providing equitable access to healthcare for rural locations, the military, and prisoners, but current applications of telehealth have changed to a focus on providing convenience to patients and reducing healthcare costs (Dorsey and Topol 2016).

Telehealth services also allow patients to take greater control over their health, boosting interest in maintaining personal health and providing pathways for patients to educate themselves on how to monitor their chronic illnesses, which allows patients to feel secure in their own health (Yang 2016). As telehealth expands, so are the

applications or categories of telehealth services. Early applications of telehealth services were for acute conditions such as trauma, but more recently, telehealth has expanded to include school visits by medical professionals and video and telephone calls. It is the belief of many healthcare professionals that the future models of care will include technology in the forms of data transfer from RPM, education of patients, and frequent virtual visits from healthcare practitioners (Dorsey and Topol 2016).

The third trend in telehealth is that healthcare is moving away from solely care in medical institutions. Telehealth has historically been used in hospitals and clinics, but as technology advances, telehealth is allowing healthcare to move to the home and mobile devices; telehealth today is really subject to the convenience of the consumer. With the advancements of mobile networks and portable diagnostic services, telehealth is moving to the home and settings outside medical facilities (Dorsey and Topol 2016). Telehealth will also enable academic institutions to better provide healthcare to students through their student health centers (Dorsey and Topol 2016). Academic institutions can and should use telehealth to expand health services to students and provide special resources, such as specialty care, mental health, and counseling services. This can be compared to academic institutions providing online courses for students to earn a degree remotely, all while overcoming the barrier of distance.

Benefits

To date, telehealth visits have resulted in high satisfaction from patients and clinicians and will likely continue to grow in the healthcare field. According to the 2018 Telemedicine Industry Benchmark Survey, telehealth has the potential to increase patient satisfaction, improve patient engagement in their healthcare, and enhance overall patient

experience (Klingler 2018). The 2017 American Well consumer survey found that patients are interested in seeing a provider via video conference citing the ability to quickly get an appointment and be seen by a physician. Patients also reported greater satisfaction with the treatment of their health in video compared to an in-person visit. Due to this, patients are now more likely to choose healthcare plans and practitioners that cover and provide telehealth services (Klingler 2018).

Many health systems have begun to adopt telehealth delivery to its services, and these health systems use a variety of models to produce successful telehealth programs. The Mayo Clinic is a good example of a model, and by 2020, they plan to serve over 200 million patients across the globe (Dorsey and Topol 2016). It is often surprising to those who study telehealth that the University of Mississippi Medical Center's Center for Telehealth is often used as a model for health systems and companies to implement telehealth programs. After speaking with Michael Adcock, the Director of the Center for Telehealth, I learned that The Mayo Clinic has worked with UMMC to develop their telehealth system, which will be further discussed in the research portion of this thesis.

In order for telehealth to be an accessible platform of healthcare delivery for all, it needs to be user-friendly while appealing to all healthcare consumers. While technology is rapidly advancing, many find it hard to keep up with the changing technological world or have a general distrust of technology systems, especially older members of the community. But the rapidly changing technological world does not only affect geriatric patients, but those who have low satisfaction with user experience in many other platforms, and this can impact the success of telehealth in health systems (Bakalar 2016).

Telehealth has the opportunity to address many convenience barriers to healthcare, including distribution and number of practitioners, location barriers, and appointment availability. With patients and doctors taking less time to travel and meet with patients, there is more time for the practitioners to see other patients and provide care remotely, all while reducing costs and providing exceptional patient care (Dorsey and Topol 2016). Telehealth has increased access to healthcare for many people who otherwise would not receive the medical care and attention they need but has also provided convenience for those who are looking for quick options for healthcare.

Millennials, a group often searching for the cheapest options, also have an opportunity to save money through telehealth. Telehealth has become a convenient method of healthcare delivery for Millennials and younger Americans who tend to move often or frequently travel. Before telehealth, many providers required a consultation before accepting patients, but through telehealth, one can bypass that step and immediately receive medical care. Patients can also easily communicate with practitioners and receive urgent or quick visits, which the younger generations appreciate for their on-the-go lifestyle (Rehm 2016). Healthcare could potentially follow a path similar to retail; care may migrate from hospitals, to clinics, to the home, and eventually to tablets and smartphones.

Telehealth has the ability to change the patient care model to match the needs of future patients and practitioners. The patient-practitioner relationship may evolve as telehealth evolves, but if practitioners are trained properly, they will always have the best interest of the patient in mind and will take the time to develop relationships through the technology (Dorsey and Topol 2016). Convenience of care is a very important driver in

telehealth. The ability for patients to avoid travel to see a physician or spend time in the waiting room is often cited as a benefit, and organizations using telehealth can reach their health services to a broader area and provide care to those who would not originally be able to access healthcare (Donohue 2016).

Along with improving access and providing convenience, telehealth has the potential to improve the efficiency, coordination, and integration of health care systems. The benefits of having telehealth services exceeds only improving access to healthcare or lowering costs. It can actually provide extensive collaboration between practitioners in bettering patient health (Bakalar 2016). Many large health systems are moving towards integrated healthcare models, and telehealth can help to push this goal. Telehealth also has the potential to create environments where there is even more patient-centered care while reducing costs (Yang 2016).

Telehealth offers practitioners the ability to enhance collaboration after consults or peer review in many difficult cases. This collaboration using technology can be more beneficial than traditional methods of collaboration, such as conferences or meetings, and often captures information in a more meaningful way that can quickly be delivered back to the patient and improve quality of service (Bakalar 2016). Telehealth allows for health information to be stored in a hub format and shared through health systems to better patient care. In the future, more communication will occur between health systems and partners and they will share their remote medical sources (eVisit 2018).

Future

The healthcare community can be optimistic about the potential that telehealth can bring to improving healthcare delivery. Estimates indicated that in 2015, 15 million

Americans received remote medical care, and this number is increasing today. Changing reimbursement models will drive this increase and social factors will provide growth as patients become more comfortable with the technology used in telehealth (Donohue 2016). Technology has become widely available in the United States and abroad, which will allow the healthcare field to rapidly innovate and develop better technologies for diagnosis, treatment, and prevention as well as predictive models to better health outcomes. In order to properly implement such programs, telehealth must overcome the challenges of this delivery system while reforming payment and reimbursement models through effective policy. The challenge for telehealth is that policies must align with incentives so that the most efficient way of providing healthcare is adopted, instead of the current model where reimbursement policies incentivize volume as opposed to outcomes (Bakalar 2016).

The future is likely to bring more advances in technology, which will bring more opportunities for research that will change the delivery and systems of medical care. In the short term, over 90 percent of the human population are expected to have smartphones by 2020, which will allow for advances in telehealth via the smartphone. The smartphone is evolving and becoming increasingly sophisticated every day (Dorsey and Topol 2016). Technology has been the catalyst for the surge of telehealth use. With improvements in wearable devices and portable technologies, it is possible for patients to obtain treatment and medical education from home (Donohue 2016). In the future, there may be new sensors and artificial intelligence that will allow smartphones to passively monitor health status, vital signs, and recommend health courses without being prompted. With these new technologies comes grand amounts of data that are collected and shared

from every device that will allow researchers to interpret data like never before. The data of human interactions, health, and behaviors are endless with smartphones, and many do not even know that their smartphones have the ability to collect and store this kind of data (Dorsey and Topol 2016).

Telehealth continues to grow and is likely to grow exponentially over the coming years as technology advances more rapidly than ever before. Social factors are also an incredible influence of the success and future adoption of telehealth. In today's society, the family does not stay together. Children often move away, and parents and grandparents often need support that traditional methods of healthcare provide, but not on a personal or familial level. Although families may be geographically separated, technology allows families to stay together and children to care for their parents and grandparents so that they may monitor health from a distance and connect their loved ones to clinicians with a touch of a button (Dorsey and Topol 2016). Familiarity with the internet and its offerings are increasing, and the role of technology in healthcare is transforming to become more socially acceptable and normal to patients. For example, families with children who have rare conditions or disabilities often seek technological solutions to improve health rather than only consulting the physician that they see in the clinic or hospital (Dorsey and Topol 2016).

Telehealth has also changed the dynamic of healthcare delivery. In the past, only providers had the control to refer patients to specialists or other providers. With telehealth, patients are becoming initiators of their own health and health system and are able to request help right when they need it, which gives patients more empowerment in their own healthcare. This level of participation in one's own healthcare allows patients

to be more of a participant in the decision-making process of their care and it can even make patients more compliant or adhere to medical recommendations. When patients feel as if they are a part of the decision-making process, they also begin to be more accountable to their own care (Bakalar 2016). With the patient being in greater control of their health, this can lead to better health outcomes and greater patient satisfaction.

Many articles on telehealth have some focus on future trends and ideas for future research in telehealth. This is important to note, as the telehealth field still needs extensive research as it continues to develop. With the large amounts of data that telehealth can provide, there will be a need for qualitative and quantitative research to break down all the data into a form that makes sense and is beneficial to those trying to implement telehealth or provide better options for telehealth (Abbott and Liu 2013). With more research on telehealth, health systems and medical professionals can develop industry-wide best practices so that health providers can best serve patients while delivering affordable healthcare (Rehm 2016).

Challenges and Recommendations

Telehealth delivery will require more research and more advanced evidence to provide the best possible care to patients and providers through telehealth. These research recommendations include topics on physician leadership, reimbursement, licensure, liability, human factors, device integration, privacy, security, performance measurement, patient engagement, the patient-physician relationship, and research design (Tuckson et al. 2017). These research recommendations are explained in Figure 4, and a short summary of these recommendations are provided following the table.

Table 2. Recommendations for Telehealth Research.	
Topic	Recommendation
Physician leadership	Physicians should seek to enhance telehealth care delivery through collaborations with telehealth technology and service providers and contribute to the evidence base by comparing telehealth outcomes with usual care.
Reimbursement	Current Procedural Terminology codes should be updated to facilitate reimbursement-related research in fee-for-service settings, and the effect of alternative payment models that use bundled telehealth services should be studied to determine purchaser returns on investment.
Licensure	The necessary facilitation of interstate licensure should be supported by ongoing research regarding any quality-of-care issues that may arise.
Liability	Evidence is necessary to better understand what, if any, quality and safety risks may differentiate telehealth service delivery from traditional in-person care.
Human factors	Research on user-centered design is needed to facilitate the integration of telehealth into clinical workflows and to optimize patient engagement.
Device interoperability and data integration	Evidence-based best practices and standards that support the most effective integration of devices and data streams from clinician and patient telehealth engagement should be widely shared.
Privacy and security	Standardized guidelines are necessary and should be based on evidence and best practices to support appropriate safeguards and regulatory oversight.
Performance measurement	Enhanced evidence is required to address gaps in existing telehealth-related clinical performance measures and enhance those currently available.
Patient engagement and the evolving patient–physician relationship	Evidence-based guidance is needed to support health professional counseling and engagement with patients and caregivers across the full spectrum of telehealth services and technologies.
Research design and methods	Telehealth research in real-world settings requires alternative research designs, new research methods, and innovative analytic techniques that supplement traditional randomized, controlled trials and should be supported with enhanced funding and an expanded workforce.

Figure 4: Recommendations for Telehealth Research (Tuckson et al. 2017)

Reimbursement policies and practices are a major priority when it comes to any healthcare delivery service or method. Physicians, health systems, and patients want to know that they will be reimbursed for services, and telehealth is no exception. With telehealth, providers can deliver high-quality care at a low cost, which is critical for the future of healthcare as it moves towards a system of values-based payment models. In order to obtain benefits from telehealth services, states must move toward full parity laws. Without this, there are limited incentives for the development of telehealth and providers will continue to focus on in-person care, which will keep costs high with the current shortage of healthcare professionals (Yang 2016).

With the recent change in reimbursement policies to provide incentives for exceptional care delivery and the use of integrated health systems, telehealth has incentives to grow. The Centers for Medicare and Medicaid Services constantly re-evaluates its system of reimbursing telehealth services which offers important benefits that support providers in the use of telehealth. From a policy perspective, most liability and insurance companies use the physician's state of licensure when defining coverage, rather than the patient's location or the location of the service. More research is also needed on the development of administrative coding to make telehealth a reimbursable healthcare delivery service (Tuckson et al. 2017).

Although a bright future seems present for telehealth, obstacles exist that prevent the full implementation of such programs in health systems. The most common obstacle for health systems is reimbursement, but these issues continue to improve over time as the value associated with the implementation of telehealth programs is seen by policymakers. There is need for knowledge to understand the distinctions in quality and safety risks of traditional healthcare delivery and telehealth services. Federal and state guidelines for telehealth security and privacy are currently not standardized, and administrative and technical safeguards are needed to enhance security of telehealth services (Tuckson et al. 2017). Clinical and legal concerns are also potential barriers, but healthcare organizations and lobbying firms consistently work with state, local, and federal agencies to develop solutions (Donohue 2016).

A common point associated with the implementation of telehealth is that these services will inevitably change the patient-physician relationship, which is not necessarily true. Wireless monitoring, mobile health, video conferencing, and others,

provide innovative ways for patients and providers to extend care relationships beyond a traditional visit. The relationship will of course be affected by these new services, and it is necessary to evaluate the potential challenges of evolving physician relationships (Tuckson et al. 2017). According to the American Medical Association (AMA) guidelines, physicians using telehealth should “inform patients about its technology and service limitations, advise patients to let their primary care physicians know when they have used telehealth, and support policies and initiatives that promote access to telehealth services for all patients who could benefit from receiving care electronically (AMA 2016).” As described by the AMA Council on Ethical and Judicial Affairs, new models of care and healthcare delivery methods will emerge, but it is the job of the physician to remain steadfast in their fundamental ethical responsibilities, and those responsibilities should remain the same as long as physician has access to the information, as they need to make good decisions for the patient (Tuckson et al. 2017).

In order for physicians to properly provide care, they require confidence in the care standards that telehealth tools and services provide. Physicians, of course, have specialty in health care delivery that many developing telehealth software or products lack, so there is a need for physicians to engage with telehealth innovators. The American Medical Association (AMA) supports this, with their Council on Ethical and Judicial Affairs saying that “physicians should support ongoing refinement of technologies and the development for clinical standards for telehealth and telemedicine (1587).” The AMA also highlights that physicians must be involved in the implementation of telehealth so that negative consequences of telehealth implementation are avoided, and patient satisfaction is maintained (Tuckson et al. 2017).

Telehealth has the potential to solve many issues facing the healthcare system in the United States today and in the future. Telehealth can save the United States billions of dollars, while also providing quality healthcare to patients. The United States healthcare system is in need of new systems and healthcare delivery methods to alleviate costs and disparities around access, and telehealth is an answer (Schumacher 2016). Although there is no single solution to healthcare and policies make the future of healthcare uncertain, telehealth can play a role in alleviating barriers to healthcare.

CHAPTER IV: RESEARCH DESIGN

Research Design

As previously mentioned, telehealth is a vast topic and tends to be complicated by the many categories, definitions, and understandings of telehealth. I found it necessary to delve into telehealth specifically in Mississippi and gauge the overall feelings and understanding of telehealth in the state. The goal of this original research was to explore healthcare in Mississippi and learn from healthcare administrators about the healthcare needs in Mississippi and how telehealth can provide solutions to current health barriers. By talking to experts in the healthcare and telehealth field, I hope to eventually gain a background on what is needed in Mississippi and how telehealth can lift the access to healthcare burden in Mississippi and address some of those needs.

To accomplish this, I conducted research in two ways: semi-structured interviews through site visits and a literature review through an original bibliography method. During the site visits, I took hand-written notes of the prepared but open-ended interview questions. After taking the notes at each site visit, I transcribed the notes, developed a synthesis document of all site visits, and sent the synthesis document back to the interviewees for them to review and provide feedback. This original research was then combined with an extensive literature review, and the results and discussion section of this thesis show the connections made between the two research formats.

Institutional Review Board Process

In order to conduct original research via interviews with human subjects, it was necessary to complete an Institutional Review Board (IRB) process. The IRB process was facilitated through the University of Mississippi IRB composed of faculty members who utilize human research often through their discipline, researchers whose primary interests are non-scientific, and members of the community. The human subjects review process is administered by the Office of Research and Sponsored Program's Research Integrity and Compliance Division. All University of Mississippi human research activities are guided by the ethical principles in The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research (Ole Miss IRB).

Before beginning research and conducting site visits during the Honors Experiential Learning in Telehealth course with Dr. Kate Centellas, Seema Murugan and I completed the Abbreviated IRB Approval form, which included an interview sample, model information sheet, recruitment script for participants, and a description of a snowball sampling interview format. The project title for the proposal was Telehealth in Mississippi, with Dr. Centellas as the Principal Investigator and the project advisor. Shortly after applying, we received approval to conduct our research with human participants under Protocol #19x-024 with an exempt status under 45 CFR 46.101(b)(#2). The IRB forms can be found in Appendix A.

The IRB process included a project summary form, which described the research to be conducted. The following paragraph summarizes the information on the IRB approval forms. The project summary states that, "The delivery of healthcare is rapidly changing to fit a more technological and advanced system of healthcare. This research

will look at telehealth and develop topics, themes, and questions to understand this new healthcare model. This research will look at telehealth in Mississippi and develop topics, themes, and questions to understand this new healthcare model and eventually begin to gain funding, research benefits, and implement these programs across Mississippi.” The proposed interview subjects, per the IRB approval, will be over the age of 18 and may include college students, healthcare professionals, physicians, patients, and members of potential telehealth program sites. The form specifies that subjects will be recruited via email. The document also states that we will begin with UMMC Telehealth partner providers and ask them to refer additional participants to us in a snowball sampling format. Procedures for interviewing via the IRB document say that participants will be notified of project goals and procedures the participant must go through. The participants will be asked questions by the researcher, and the questions will be modified based on each participant's responses. The interview questions are not constant as each interview will be conducted conversationally.

As written in the IRB research design section, the first aspect of research will be to analyze existing secondary resources to gather relevant information to conduct original research through interviews. The interview process will be conducted orally and will not disclose any personal information, but will gather information regarding attitudes, ideas, wants, and perceptions of telehealth. Following the interview process, the researchers will gather results and begin to extrapolate relevant data to build a report to combine the existing secondary research to the original empirical research. This research will be a combination of original empirical data collection, literature review of secondary sources, and will culminate in developing original themes and conclusions.

Bibliography

An extensive literature review and documentation process is important in the study of telehealth, as it is a developing field with few published resources. In order to develop a database of articles, journals, books, and other published materials on telehealth, a bibliography was formed on Zotero with the intention to share the database with other researchers in the field. I brought this idea to Dr. Kate Centellas after learning about the Zotero program from Dr. Nidhi Vij in the Department of Public Policy Leadership. As a student of Dr. Vij in Public Policy Design and Analysis, I learned of her research in maternal fetal health in India and her experience with telehealth in that subject. After discussing the limited resources for telehealth research, she suggested using Zotero to develop a database of sources with the option to tag sources to keywords, making it easier to organize and locate certain documents.

I brought this idea to Dr. Centellas during our first Honors Experiential Learning in Telehealth meeting and learned that she was familiar with this bibliography platform in her field of work. We decided to utilize Zotero to not only organize our resources, but to eventually share the database with other researchers to allow for collaboration in research. Early in the research design phase, we formed the Zotero database, and Seema Murugan and I began inputting telehealth resources, including books, articles and journals. The tagging system at first was informal; Seema and I would mark each resource with tags related to the information presented in the title and abstract, and on some articles, the methodology. The tags included barriers, mental health, remote patient monitoring, chronic illness, reimbursement, and children, just to name a few. After

compiling around fifty resources, Seema combined all the tags and developed a uniform tagging system.

The new tagging system took all the original tags and placed them into a sorting system to develop subcategories. The subcategories were implementation, telehealth, diseases, and barriers. Each subcategory had its own set of tags, which are listed in Appendix B. After developing subcategories, we narrowed down the list of tags to develop one list: ethics, perceptions, remote patient monitoring, reference, schools/colleges, children, review, barriers, implementation, background, compare/contrast. Using this new tagging system, we went back through each resource and re-tagged each source with the main tag list and the subcategories list.

The bibliography is now complete, and the Zotero database was shared with others in the telehealth field. The bibliography is a working database, and resources will continue to be added as they are found and used. The telehealth database created in Zotero allowed many researchers to collaborate and contribute to the many resources, articles, journals, and theses written on many subjects in telehealth.

Description of Site Visits

The original research took the form of open-ended, semi-structured interviews at three different site visits. The purpose of the site visits was to develop an understanding of the healthcare needs in Mississippi, how telehealth is currently being utilized, development of telehealth, experiences of healthcare providers with telehealth, telehealth in the future, and obstacles to telehealth. At each site visit, Seema Murugan and I developed a list of questions to ask the contacts, but we did not rely solely on those questions during the interview. We allowed each interview to flow naturally, which

allowed for new questions to emerge during discussion. During each site visit, I took hand-written notes of the direct questions asked, and of the impromptu responses of the interviewees. The notes can be found in Appendix C.

The first site visit was at the University of Mississippi Medical Center's Center for Telehealth in Jackson, Mississippi. Dr. Kate Centellas, Seema Murugan, and I traveled to Jackson on July 10th, 2018 to meet with Mr. Michael Adcock, the Director of the center. The detailed notes from that discussion can be found in Appendix C. During the visit, Seema Murugan and I took turns asking questions to Mr. Adcock and had a discussion about how students at the University of Mississippi could help the center with future research projects.

The second site visit occurred on July 25th, 2018 at the James C. Kennedy Wellness Center in Charleston, Mississippi with Dr. Catherine Woodyard Moring, the Director of the center. The Kennedy Wellness Center is associated with Tallahatchie General Hospital and is a grant-funded program to better health in rural Mississippi. Dr. Centellas, Seema Murugan, and I spoke with Dr. Moring on a variety of topics, which can be found in the site visit notes in Appendix C. Seema Murugan and I again asked our respective questions, and Dr. Moring gave us a tour of the facility. The facility is a magnificent Wellness Center in the middle of rural Mississippi, with services such as therapy, clinics, fitness studios, and fitness equipment. The facility also has large locker rooms for clients equipped with showers. A membership to the Kennedy Wellness Center does cost a fee, but the center works extremely hard to meet the needs of each client, no matter their financial situation.

The third and final site visit was conducted on November 9th, 2018 at North Sunflower Medical Center in Ruleville, Mississippi with Joanie Perkins, the Chief Compliance Officer, and Sam Miller, the Chief Executive Officer of the hospital. Dr. Kate Centellas and I traveled to Ruleville that Friday afternoon to speak with Mrs. Perkins and Mr. Miller, where we again asked several questions, but allowed the conversation to flow outside the structured questions. This site visit was one of the more free-flowing interviews, as we discussed many topics outside of the regular scope of questioning like the other site visits. The site visit notes can be found in Appendix C.

Similarly, to the other site visits, one question discussed during our meeting was what students can do to further telehealth projects and research in Mississippi, whether it be specific to certain health centers, like the North Sunflower Medical Center, or to lobbying for telehealth and its many administrative needs. We also were able to gather information on contacting Mississippi state legislators on their work with telehealth and lobbying for telehealth on the state level. In the meeting, we also talked about the contact information for Mike Garcia with the Mississippi Health Information Exchange and Ryan Kelly at the Mississippi Rural Health Association for potential future site visits or research. After each site visit, I took my original hand-written notes and transcribed them into working word documents where I internally made sense of the notes I had taken at each site. I put my thoughts into an outline form that could be easily remembered for the results section of this research.

CHAPTER V: NEEDS IN MISSISSIPPI

Site Visit Results

After a month of independent research on the wide and dense topic of telehealth, an opportunity arose to not only learn more about telehealth in Mississippi, but to learn in the field and begin original research to aid in data collection on the many healthcare needs in Mississippi, and how telehealth delivery can be a mechanism of successful healthcare delivery. Through my thesis research process, I was given the opportunity to work with Dr. Kate Centellas on a telehealth experiential learning course designed to help broaden my knowledge of telehealth and eventually provide tangible support and original research for my thesis work. This honors course provided opportunities to speak with experts on Telehealth in Mississippi in the field, which led our group to travel to the University of Mississippi Medical Center in Jackson, the James C. Kennedy Wellness Center in Charleston, and North Sunflower Medical Center in Ruleville.

UMMC Center for Telehealth

As described in research design, I participated in three site visits while under the direction of Dr. Kate Centellas along with another undergraduate student, Seema Murugan. The first visit was to the University of Mississippi Medical Center's Center for Telehealth at the C-Spire building in Jackson, Mississippi to meet with Michael Adcock, the executive director, and Tearsanee Davis, the clinical director. This Telehealth center is designated as a national Telehealth Center of Excellence, and UMMC continues to pave the way nationally for telehealth programs and is a model for many other programs

nation-wide, including the program at The Mayo Clinic in Rochester, Minnesota. What follows is documentation of my notes from that site visit.

According to Michael Adcock, telehealth describes connecting any patient to a provider in any form, and closely connected is telemedicine, which is a live audio or video interaction between a patient and provider or a provider to another provider. Telemedicine began in the Emergency Department of the University of Mississippi Medical Center in 2003 and was originally created to connect rural emergency room physicians and family medicine physicians to specialists in large healthcare settings. Providing specialty care via telehealth can be both scheduled and unscheduled, with its goal to improve access to specialty care. This method of delivery provided physicians and providers with another option from having to commute to rural areas and see patients, which proved to limit time and expenses of traveling. The specialty care program connects both the Emergency Department and providers, in non-emergent situations, access to needed specialty care in rural areas in Mississippi.

Another program the telehealth center in Jackson provides is a “store and forward” mechanism for radiology, cardiology, and other imaging needs so that providers may receive imaging results more efficiently to better treat patients. This program allows providers to send imaging to specialties that are not staffed 24/7 in an asynchronous process rather than a live process. The center also provides Remote Patient Monitoring programs for patients with chronic diseases and allows patients to manage their disease from their home by providing education to allow patients to monitor their illness themselves rather than going in to a clinic weekly or monthly. The program also allows

health care providers to intervene automatically when a patient is off course, rather than having to wait for an appointment to correct a problem or answer questions.

Along with programming, we had a discussion on the state of access to healthcare in Mississippi, which provided insight that access to healthcare affects everyone in Mississippi. Michael Adcock explained that access is not necessarily poor or rural, but wealthy and urban populations experience access to healthcare barriers as well, as there is a shortage of healthcare providers nationally. He highlighted that as a world and as a community, we must figure out how to define these terms and define what exactly it is when we talk about telehealth, because telehealth centers and healthcare providers across the nation have differing definitions of telehealth, which creates another barrier. To the UMMC Center for Telehealth, telehealth is a delivery mechanism that is convenient and accessible at the best price possible. It is an extension to medicine, and its goal is to deliver sustainable medicine to people where they are.

The next question asked what models of telehealth the center uses, and who the center has helped to implement telehealth programs in the state. The center uses the EPIC medical database to share medical information with medical providers and patients across the state, so even if a patient does not see their provider regularly or see the same provider, they have access to their medical information. A question immediately arose regarding how patients and providers know about Telehealth, and how the center gets the message out that telehealth is an option in Mississippi. Michael Adcock explained that the messaging depends on the service. If it is specialty care that is needed, the provider is in control of the telehealth programming, so patients cannot initiate all types of telehealth programming offered.

To close this site visit, we asked Michael Adcock and Tearsanee Davis what they needed help with the most to continue their mission and maintain their Telehealth Center of Excellence designation, and they echoed that they will need to continue to develop research plans or potential projects to help rural Mississippi communities. The potential projects include Remote Patient Monitoring transition programs, new Remote Patient Monitoring programs, and data collection for school-based telehealth programs.

Remote Patient Monitoring (RPM) transition programs are programs that will follow-up on original patients from original RPM studies. Many RPM programs are located in the Mississippi Delta, particularly Sunflower County, and the center would like to know how past RPM programs changed, benefitted, or influenced patients via a longitudinal study of what happens after an RPM program is complete. Are patients able to maintain their chronic illnesses without the support of a telehealth provider? Was the education provided through the RPM program enough to create lasting behavioral changes? Is follow-up education necessary to provide a transition period after the RPM program? Research is needed to determine how patients are maintaining their chronic illnesses without the RPM program and what resources may be needed to transition patients off of the program after completion.

Similarly, there is a need to review expired or existing RPM programs to begin implementing new programs, both in rural and urban areas. Needed programs include RPM for high-school and college-aged students to monitor their chronic illnesses and provide education as they grow and develop. This will allow for more independence and self-control of their disease, rather than being heavily reliant on a provider or appointments. Programs are particularly needed for students transitioning from high-

school to college to help them prepare for a new environment and prepare to be away from parents or caretakers who know the daily routine of the chronic disease.

For all students, data collection is needed for school-based telehealth programs to allow for policy changes to provide a sustainable method to get telehealth into schools and grants to provide funding for current school health programs. Currently, UMMC is piloting a telehealth program in the Quitman, Mississippi school district, but they still need data collection and analysis of the program to further develop and sustain telehealth at the school. In terms of policy changes, research is needed to develop a sustainability plan and a lobbying plan to change administrative code to allow schools to be a site for medical reimbursement.

James C. Kennedy Wellness Center

Into the Fall semester, we visited the Kennedy Wellness Center in Charleston, Mississippi which is associated with the Tallahatchie General Hospital system. We met with Dr. Catherine Woodyard Moring, the Director of the wellness center, who provided us a background of access to healthcare in the Charleston area, and then a needs assessment of their community. Catherine Woodyard Moring described that Tallahatchie County rated second lowest in the state of Mississippi for healthcare disparities. A recent comprehensive health needs assessment provided valuable information that allowed Tallahatchie County to receive a grant, making way for the Kennedy Grant for the Wellness Center.

The mission of the center is to provide management and education of chronic diseases, primarily focusing on diabetes, obesity, and quality of care for the chronically ill. Inside the center is a clinic that is open from 8am to 9pm on Monday through Friday,

and this clinic provides physical therapy, occupational therapy, wound care, emergency services, and a pediatricist. Currently, patients in Tallahatchie County have to travel to larger cities like Jackson, Oxford, or Memphis to receive any sort of specialty care, but the center has been able to alleviate some burden for many patients. There is a need for wellness in the community because of high rates of chronic disease and limited health education, and the center has a mission to tackle that need.

Currently, telehealth is not a priority at the Kennedy Wellness Center, but there is a need for telehealth programming. The Delta Health Alliance provides much of the center's assistance, but to improve health outcomes in the Mississippi Delta, more is needed. As mentioned previously, chronic illnesses are a large burden in Tallahatchie County. Diabetes continues to plague rural Mississippi and is a constant problem that rural physicians and medical centers have to deal with, as a large percentage of patients have diabetes. Diabetes RPM programs could greatly impact this area in rural Mississippi and could provide patients with much needed education and resources that an appointment may not be able to provide. Another tangible need at the center is a proposal to receive equipment from the United States Department of Agriculture, as equipment and supplies sucks up a large cost for the center.

A common theme during this site visit became the many barriers to telehealth in the Delta region. These include a universal understanding of telehealth, the many capabilities, billing and reimbursement, equipment funding, and accessibility. Like the previous site visit, we asked Dr. Moring about potential research that could aid in addressing the healthcare needs in Mississippi. Research on reimbursement and changing policies continued to be an important area. In particular, the Kennedy Wellness Center is

interested in how ACO impacts telehealth because ACO is reimbursed for quality of care, and that definition may change with telehealth delivery. Preventative medicine is also very important to the Kennedy Wellness Center, and telehealth has the potential to drastically cut costs for preventative medicine in the area, particularly in relation to diabetes screening, which will allow providers to catch undiagnosed diabetes or pre-diabetes, aiding in decreasing diabetes in the area in the future.

In Tallahatchie County, and similarly to other rural cities in the Mississippi Delta, there are a lack of healthy food resources, commonly known as a food desert, allowing for limited nutritious options and dietary intervention. Dr. Woodyard Moring argued that telehealth could potentially provide education to parents on providing healthy meal options with the resources available to them, which may include how to prepare a healthy meal from items from a convenience store, and similar approaches. Similarly, to limited nutritious food options, the Mississippi Delta also experiences many barriers to behavioral and mental health, with the main barrier being a shortage of practitioners and clinics who have any sort of behavioral health services. Mississippians in the Delta have to overcome travel barriers to see practitioners in other areas, which is often not an option for those who do not have private transportation.

Lastly, Dr. Woodyard Moring echoed the need for lobbying for telehealth and the need to change policies for reimbursement to make telehealth a sustainable healthcare delivery method. Reimbursement is a constant issue of telehealth, as the administrative codes for reimbursement are different for schools, clinics, and hospitals, but lobbying is the gas to put policy in the driver's seat to secure sustainability. How do we engage in health communication in Mississippi to better our needs and get people involved in

advancing healthcare? This engagement could come from funding, grants, but most importantly reports of successes in telehealth, which may help lift the barrier of telehealth understanding in the state.

North Sunflower Medical Center

The last site visit was North Sunflower Medical Center located in Ruleville, Mississippi. We spoke with Joanie Perkins, Chief Compliance Officer and Sam Miller, the Chief Executive Officer of the Medical Center. Joanie Perkins is very familiar with telehealth, as she worked with tele psychology services in Indianapolis, Indiana and now oversees all telehealth services at North Sunflower. North Sunflower Medical Center is a critical access hospital, which is a federal program that helps small hospitals in rural areas serve patients who are far from other emergency care options. Critical access hospitals must have no more than twenty-five beds and patients cannot stay more than 96 hours. North Sunflower Medical Center follows this policy, with exactly twenty-five beds.

North Sunflower has a large outpatient population with specialists who come from Oxford and Jackson to see patients. It is also home to a rural health clinic that sees between thirty-five hundred and four-thousand visits a month with a staff of four doctors, eight nurses, and twelve part-time staff, and also has 24-hour emergency services. The clinic is invaluable to patients in the Ruleville area, as it is open sixteen hours a day, seven days a week. The rural health clinic also helps with non-urgent patients from the emergency room and has a full lab and radiology capabilities. North Sunflower also has a sixty-bed nursing home attached to the hospital and a rehab hospital open all week. North Sunflower Medical Center is a vital medical resource to rural Sunflower county, and they

do believe that telehealth enhances their capabilities and helps to provide more to their patients.

North Sunflower Medical Center has been a user of UMMC Telehealth services for eleven to twelve years and has used RPM services that have proven to be the largest programs in the state. The diabetes RPM project was extremely successful in Sunflower County, and North Sunflower would like to replicate the program and provide it to more patients, but funding is in the way, as there is no way to pay for a new program currently. The first diabetes RPM program cost the hospital more than \$75,000 after grants and state help, and the program, although successful, saw some problems with the tablets each patient used to monitor their diabetes. But plans to further telehealth in the area at a lower cost are in the works, utilizing more cell phones and tablets that many patients already own that could facilitate RPM programs and other services rather than the hospital having to pay for electronics for each patient being monitored.

Along with RPM programs for diabetes, North Sunflower utilizes telemedicine in the emergency room and tele therapy, but there is an extreme need for tele dermatology, but Medicaid does not pay for “store and forward” methods that tele dermatology requires. Hybrid approaches are common, where the hospital will use a cardiologist in the hospital, for example, but the monitoring and other specialties are all via technology. North Sunflower has the technology, but like other site visits, the area lacks sufficient lobbying and funding that are needed to change reimbursement procedures and make telehealth sustainable in the area.

Joanie Perkins and Sam Miller described their experience with reimbursement and logistics associated with telehealth implementation as a constant battle. For Medicaid,

telehealth can only be reimbursed at the origination site, for example the rural health clinic, but telehealth is meant to connect patients to providers at a distance. Although Anthem Blue Cross Blue Shield and Medicaid are the best insurance services for telehealth reimbursement, healthcare policies are not written to benefit telehealth delivery. It was reiterated that grant money is not enough to sustain these programs. For telehealth to work, it needs to pay for itself and be sustainable. To conclude, this site visit was extremely engaging and rewarding in that both contacts provided external contacts to further research in the legislative side of telehealth as well as with the Mississippi Health Information Exchange network that has been extremely beneficial for telehealth in Mississippi.

Synthesis

The following report was given to the contacts from each site visit, synthesizing the common themes and summarizing all that was learned through the site visits. The original report can be found in Appendix D. The following will provide a short synthesis on the common themes that emerged through these visits regarding telehealth in Mississippi.

Of the many barriers to Telehealth discussed, the barrier of telehealth understanding became a prevalent topic in the conversation on how practitioners, policymakers, and insurance companies must be on the same page regarding telehealth for it to be successful. There is a gap between the people who are implementing telehealth measures, the people paying, and the people who need access to telehealth. It is common for providers to lack trust in telehealth delivery in terms of its legal, ethical, and payment structures, which causes a problem with telehealth implementation if providers

do not understand these structures. This begs the question, how can we get practitioners, patients, policymakers, and insurance companies on the same page regarding telehealth? Explanation and proper implementation of telehealth reimbursement procedures are an answer, but it is also a barrier, as described in the next theme.

Reimbursement was the most common, reoccurring theme of all three site visits. Reimbursement is a constant issue in telehealth administration, and state and federal laws both play a role in this issue, making reimbursement even more complicated. Best described by Dr. Catherine Woodyard Moring of the James C. Kennedy Wellness Center, policy is the driver, but lobbying is the gas for this issue. Many telehealth programs in Mississippi rely on grant funding, as insurance companies and administrative codes are not properly assigned or “labeled” to pay for telehealth, but grant funding is not enough. Many hospitals and health systems catch the burden of funding telehealth programs, which are very expensive because of these current policy issues. It became clear that for telehealth to work in Mississippi, it needs to pay for itself and be sustainable, and we need to portray to policymakers and other stakeholders that telehealth will save money and prevent disease, all while providing exceptional patient care.

Along with administrative barriers in telehealth, there is common sentiment on the kinds of research needed in Mississippi to begin to implement projects to improve healthcare and provide needed documentation to fuel lobbying and policy efforts. Diabetes, obesity, and chronic disease management are a constant need in Mississippi, regardless of rural or urban communities, and telehealth programs have shown success in managing chronic illnesses. More research is needed to develop and review Remote Patient Monitoring programs to allow patients to manage their chronic illness from home,

educate patients on how to take care of their health, and allow patients to spend less time in clinics and hospitals. The next steps to take include these research topics, and lobbying efforts to change legislation to benefit telehealth delivery in Mississippi and across the nation.

CHAPTER VI: IMPLEMENTATION

Policy Barriers

As models of healthcare rapidly change, telehealth will likely continue to progress, but it is necessary for policy to complement the rapidly changing healthcare environment so that telehealth can be successful in addressing access to healthcare. The implementation of the Affordable Care Act and other policies that reform healthcare provide progressive changes for hospitals to seek new strategies for improving quality, access, and costs of healthcare (Adler-Milstein et al. 2014). Recent health policy trends at both the state and federal level include growing recognition by the federal government that telehealth is an important and successful healthcare delivery model to increase access to healthcare while lowering healthcare costs and maintaining quality of care. In order to further telehealth use, there must be reduction in regulations and reforms to reimbursement (Boese 2018). It is imperative for future health policies to provide effective measures to allow for the successful implementation of telehealth, and this can be done through lobbying and effective policymaking (Adler-Milstein et al. 2014).

Parity Laws

Telehealth is a significant policy issue at both the state and federal levels. There is a need in the United States for healthcare reform and telehealth can be a part of the larger solution. After much research, telehealth has the ability to remedy the health care system and it can bridge the gap between healthcare costs and outcomes in the United States healthcare system (Schumacher 2016). Telehealth is governed by state and federal law,

making it very complicated to implement telehealth policies that provide a quick and easy overhaul of the system to successfully implement telehealth across the nation (Yang 2016). Health systems in many different states utilize telehealth services, but the extent to which health systems have adopted and use telehealth varies from state to state due to barriers in federal and state law. This is because state laws define, regulate, and reimburse for telehealth services differently and that state insurance laws and regulations often do not match (Boese 2018).

Problems with telehealth reimbursement are limiting the widespread use of telehealth, as insurance coverage for telehealth is still patchy and often ineffective (Dorsey and Topol 2016). Surprisingly, almost every state reimburses for some form of telehealth in its Medicaid program, but the models can look different from state to state. In Mississippi, a parity law in the Mississippi Insurance Code requires reimbursement for telehealth at the same rate as other medical services (deShazo and Parker, 2017). Most states require synchronous interactions in order to reimburse, but the Center of Connected Health Policy estimates that 14 states reimburse for asynchronous consultations and around 20 states reimburse for remote patient monitoring programs. The majority of state also have laws requiring commercial coverage for various telehealth services (Boese 2018). A total of 29 states, as of 2016, have telehealth parity laws requiring that private insurers cover telehealth services to the extent that they cover in-person care. In addition to state parity laws, 48 state Medicaid programs cover telehealth services, but with their own designated restrictions. According to this same report from 2016, the major reimbursement problem alongside insurance coverage is with Medicare, which generally

reimburses for telehealth services only in clinical facilities where there is a shortage of healthcare professionals (Dorsey and Topol 2016).

State and Federal Policies

In the United States, federal health policies and standards are set by the Centers for Medicare and Medicaid Services (CMS), The Joint Commission (TJC), and other federal policies like the Affordable Care Act (Olson and Thomas 2017). With the implementation of the Affordable Care Act, the federal government moved toward including telehealth services in healthcare coverage. But this federal legislation only implemented telehealth at the federal level through Medicare. In comparison, laws governing medical practice and health insurance are often enacted at the state level, as well as Medicaid programs (Olson and Thomas 2017). The power to determine if telehealth services are covered by Medicaid rests largely within the powers of individual states, and states can also govern private telehealth reimbursement policies (Yang 2016).

This disjointed policy from federal level to state level is the cause of many reimbursement and policy problems when it comes to telehealth (Olson and Thomas 2017). Due to the disjointed nature, some states are more favorable to telehealth implementation. For example, some states require insurers to cover a wide variety of telehealth services, and others leave that decision-making process to the individual payers (Olson and Thomas 2017). This creates mass confusion for many practitioners, as telehealth implementation varies from state-to-state in terms of what telehealth services will be reimbursed. These discrepancies in policy cause confusion that affects the provider's ability and willingness to implement telehealth. When the nation as a whole cannot fully recognize the potential successes of telehealth, such as cost savings, there are

significant obstacles that block telehealth from being an accepted healthcare option (Yang 2016).

Medicare and Medicaid allow reimbursement for a limited number of telehealth services, and states have the power to choose if they want to limit covered services even further than federal limitations. Private insurance companies also limit reimbursement in most states, and without the proper coverage for telehealth services, many telehealth projects are unsustainable and do not succeed, which limits telehealth growth (Schumacher 2016). Changes in reimbursement policies and requirements for telehealth programs are opening up more opportunities for telehealth in healthcare (Boese 2018). For Medicare, states have the ability to structure their own reimbursement plans. Most states require some type of telehealth coverage under Medicaid, and unlike Medicare, there is no federal law that addresses telehealth reimbursement. Federal law does not require states to reimburse for telehealth services through Medicaid, but it does restrict the types of telehealth services that are eligible for reimbursement through Medicare and origination sites for telehealth (Schumacher 2016).

Congress often hears that in order to improve access to healthcare in the United States while managing healthcare needs with modern technology, Medicare needs to pay for telehealth services. Thankfully, Congress has heard these suggestions and they have begun to make telehealth more accessible through policy (Boese 2018). In order to overcome legal barriers, there must be policy solutions driven by the public and by healthcare systems to lobby on behalf of those who are burdened by the barriers. The TELE-MED Act of 2015 was a start that enabled Medicare to provide telehealth services to Medicare beneficiaries in any state, but there needs to be more legislation that will

accelerate the removal of barriers (Dorsey and Topol 2016). The Medicare Telehealth Parity Act of 2017 modernizes the way that Medicare reimburses for telehealth and expands coverage, but the act only incrementally expands the benefits, which has slowed the implementation of telehealth. This bill does provide an expansion of origination sites for telehealth, so it can help increase the reach of Medicare when it comes to origination sites (Yang 2016).

Currently, Medicare will reimburse for a short, but expanding list of telehealth services that are conducted by eligible providers and offered in certain facilities in designated rural areas. The telehealth services Medicare generally will reimburse are for end stage renal disease, behavioral health, chronic disease management, and professional consultations (Boese 2018). The Bipartisan Budget Act of 2018 included a set of provisions known as the “Creating High-Quality Results and Outcomes Necessary to Improve Chronic Care Act (CHRONIC).” CHRONIC, which began to be implemented in 2019, expanded the Net Gen ACO waiver, expanded telehealth for end stage renal disease, improved emergency department consultations for stroke, and furthered the Medicare Advantage for telehealth. Beginning in 2020, the law extends the Next Generation ACO’s telehealth waiver authority to qualifying ACOs such as the Medicare Shared Savings Program, and Medicare Advantage plans will be able to use telehealth as a base benefit for services (Boese 2018).

Congress and the Centers for Medicare and Medicaid Services (CMS) have taken progressive steps to advance telehealth services, which include changes to the Physician Fee Schedule rule, including allowing for payment of additional codes related to chronic care management, health risk assessments, and psychotherapy (Boese 2018). The Centers

for Medicare and Medicaid Services make additions or deletions to the services defined as telehealth on a yearly basis in January. The Physician Fee Schedule is the vehicle used to make changes in this policy, and it is published in the Summer, and the final rule is published by November 1st of that same year (CMS 2014).

To conclude, the single most important barrier preventing telehealth implementation in the United States is the discrepancies between state and federal regulations. The federal government has less power than the states when it comes to telehealth. Legislation has been proposed in an attempt to fix issues associated with reserved state rights, such as licensure, but it is complicated bringing these services under federal authority and law-making power (Schumacher 2016). There is a need for telehealth in many states, but state and federal health policies continue to be a barrier to telehealth implementation. State telehealth laws dealing with malpractice, privacy, licensure, and reimbursement prevent successful telehealth implementation as well (Schumacher 2016).

Legal Barriers

Credentialing and Privileging

Telehealth transactions most often involve providers or patients communicating from two different locations, which begs the question as to which location has the responsibility for credentialing and privileging (Office of Health Policy 2016). The commonality between all healthcare policy is that all laws and regulations are based on the physical location of the patient at the time of the telehealth encounter (Olson and Thomas 2017). For example, if a child with cystic fibrosis in rural Mississippi were to see

a provider via video conferencing in Nashville, Tennessee, then that provider must abide by all Mississippi state laws when providing care for that patient.

It is very important for medical practitioners to be familiar with healthcare laws in every state where they will provide telehealth services, which is a knowledge barrier to the proper implementation of telehealth. For hospitals to be reimbursed through Medicare, there are credentialing and privileging mechanisms to allow for telehealth origination sites to be reimbursable at various locations (Schumacher 2016). Medicare covers a limited number of telehealth services that substitute in-person visits, and these services include consultations, office visits, psychiatry services, and Physician Fee Schedule services, but for these services to be reimbursable under Medicare, the patient must be at an approved origination site for the visit, and they cannot be at their own home to receive telehealth services (Yang 2016). The hospital on the receiving end of the telehealth service must ensure that the provider hospital is a Medicare participant and that it has conducted internal reviews of telehealth performances of the practitioners. The receiving hospital also must ensure that the practitioner holds a license recognized by the state where the origination site is located (Schumacher 2016).

Box 1: Centers for Medicare and Medicaid Services–approved telehealth providers (as of December 2016)

Physicians
Nurse practitioners
Physician assistants
Nurse midwives
Clinical nurse specialists
Certified registered nurse anesthetists
Clinical psychologists^a
Clinical social workers^a
Registered dietitians/nutrition professionals

^a CMS has certain billing limitations for these providers when care is provided via telehealth.

Data from Medicare Learning Network. Telehealth Services. Centers for Medicare and Medicaid Services, United States Department of Health and Human Services. 2015. Available at: <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLN-Products/downloads/TelehealthSrvcsfctsh.pdf>. Accessed December 26, 2016.

Figure 5: CMS Approved Telehealth Providers (Olson and Thomas 2017)

The origination site of the patient is also relevant for hospital credentialing purposes, but recent changes in telehealth policy by the CMS allows for telehealth to be originated by a credentialed proxy. For credentialing by proxy to be compliant of all state and federal law, clinicians need privileges at the origination and distant site that include the scope of services they will be providing via telehealth (Olson and Thomas 2017). Figure 5 shows the Centers for Medicare and Medicaid Services approved telehealth providers as of December 2016.

In 2011, the Centers for Medicare and Medicaid Services greatly improved its hospital credentialing process by allowing hospitals to “rely on the credentialing and privilege decisions of the distant hospital where the physician using telehealth practices (Weinstein et al. 2014).” The CMS and the Joint Commission now allow for the hospital where a patient is located to have the decision-making power regarding privileging for care delivered through telehealth. This removes organizational hurdles to telehealth, but

there may still be concerns about telehealth among specialists who do not like that origination sites have the power to make the decisions around their practice or expertise (Office of Health Policy 2016). Similar to policies governing approved telehealth providers, payers often require that patients are physically located at a CMS approved origination site at the time of the telehealth encounter. Figure 6 shows the CMS approved origination sites for telehealth services as of December 2016.

Box 2: Centers for Medicare and Medicaid Services–approved originating sites for telehealth services (as of December 2016)

Physicians and other health care practitioner offices

Hospitals

Critical access hospitals

Rural health clinics

Federally qualified health centers

Hospital-based or critical access hospital–based dialysis centers, including their satellites (independent dialysis facilities are not CMS-approved originating sites)

Skilled nursing facilities

Community mental health centers

Data from Medicare Learning Network. Telehealth Services. Centers for Medicare and Medicaid Services, United States Department of Health and Human Services. 2015. Available at: <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/TelehealthSrvcsfctshst.pdf>. Accessed December 26, 2016.

Figure 6: CMS Approved Origination Sites (Olson and Thomas 2016)

These origination site policies can cause problems in telehealth, as telehealth is created for convenience and to provide care to those in areas that lack healthcare resources. For example, if a rural school in Mississippi wants to utilize telehealth services in their nurse’s office, they may not be able to do so in comparison to a larger private school in Mississippi that has in-facility clinics that may be approved under CMS. Another example may be telehealth services that originate via mobile device from a patient’s home to a provider where these origination policies could cause problems (Olson and Thomas 2016). But, in the last two years, there have been extensive updates

to origination sites and exemptions that allow for telehealth services, but there are still barriers in places like schools.

Licensure

According to the Department of Health and Human Services and the Department of Commerce, licensure is a major barrier in telehealth. Physicians have to be licensed where the patient is physically located, so this can cause problems for patients using telehealth to seek medical care out of state. This requirement leaves many patients unable to access care, especially if the provider does not have the licensure (Dorsey and Topol 2016). Licenses granted to physicians are regulated by the state, and for a physician to practice in more than one state, they must apply for licensure in each state they wish to practice (Schumacher 2016). There are states that are extremely telehealth friendly when it comes to medical licensure. These states, including California and New Mexico, offer physicians telehealth licenses that reduce the barriers and costs associated with buying multiple licenses from multiple states (Weinstein et al. 2014). For most states, licensure fees are a major disincentive for physicians to obtain multiple licenses to incorporate telehealth into their practice. Along with paying for licenses, states often have other licensure requirements including background checks, fingerprinting, and continuing medical education (Schumacher 2016).

To alleviate state-by-state licensure discrepancies for telehealth services, some states have adopted alternative licensure models that allow physicians to practice in multiple states when providing telehealth services. As of 2016, sixteen states adopted a system that grants special licenses to practitioners wanting to use telehealth in multiple states (Schumacher 2016). To try and limit barriers to telehealth even further, states have

joined together to set up compacts that provide structure and processes that help facilitate licensure in other compact states. There are now 22 states in the Interstate Medical Licensure Compact, and their mission is to “increase access to healthcare for patients in underserved or rural areas by allowing them to more easily connect with medical experts through the use of telemedicine technologies (Boese 2018).” The Federation of State Medical Boards created the Interstate Medical Licensure Compact in 2014, but the effects have been limited since its creation (Dorsey and Topol 2016).

Malpractice Coverage

Malpractice liability concerns have increased with the implementation of telehealth services into health systems (Yang 2016). Telehealth puts a unique perspective on medical malpractice and the handling of protected patient information. Law is very underdeveloped when it comes to telehealth coverage, so this is an expanding field of health law. There needs to be providers who have a role in creating new policies that understand the complexity of telehealth and data safety (Schumacher 2016). Historically, liability policies specify that coverage is only available for claims that occur in a specific jurisdiction, which can cause problems for physicians who may be sued for telehealth malpractice and do not have the proper coverage for the origination site of the telehealth service (Yang 2016).

Social Barriers

Telehealth boasts many potential benefits, but it also presents healthcare providers and systems with unique risks and challenges. Predictable telehealth barriers generally fall into a technology category, or a non-technology category, which is a much broader barrier category as many barriers to telehealth are not due to technology. The non-

technology barriers are generally the barriers that undermine successful telehealth implementation (Stumpf et al. 2002). Areas of concern other than policy and legal issues include a loss of the patient-provider relationship, problems with the quality of health information, organizational complications, and overall resistance to change.

Physician and Patient Unawareness

Physicians and healthcare practitioners must believe in telehealth and its services in order for them to buy-in to telehealth and provide it to patients. There must be convincing evidence to show hospital leadership that telehealth is an investment worth pursuing, convince providers that telehealth is an effective way to care for patients, and teach patients the skills needed to participate in telehealth programs (Kruse et al. 2018). Physician and practitioner endorsement of telehealth may be one of the most important factors in telehealth implementation, and if this barrier cannot be overcome, then there is no way to deliver telehealth to patients. Physicians and healthcare leaders are also very important in healthcare lobbying efforts, and without their buy-in, necessary policies to make telehealth implementation successful across the nation will not be possible (Stumpf et al. 2002).

Technology Barriers

Broadband Connectivity

The basis of technology for any telehealth program begins with connectivity. The discrepancies in access to technology based on location and social factors is a barrier to telehealth. Patients who are older, live in rural areas, have lower incomes, or with education barriers are less likely to have internet or telecommunications access than patients who are younger, live in urban areas, have higher incomes, and more education

(Dorsey and Topol 2016). There are gaps in affordable internet connections, and an even greater emerging challenge to broadband is affordability. The price of broadband services can be three times higher in rural areas than in urban areas (Office of Health Policy 2016).

Although the United States boasts extremely advanced networks, there are still many rural areas across the nation that do not have access to any networks, and if they do, they are not capable of hosting the connection required for telehealth to work. The Federal Communications Commission has introduced initiatives such as the Connect America Fund that are working to increase broadband connectivity in rural areas. In regions such as these where connection is low or non-existent, it may be of importance for health systems to consolidate telehealth services and focus on services such as store-and-forward technology that do not require high-speed connections (Olson and Thomas 2017). Social factors in relation to technology are a major determinant in who can access healthcare, and telehealth is a means to provide for those who cannot access healthcare in a traditional way, but there are still some barriers with technology (Dorsey and Topol 2016).

Information Security

Although technology has quickly advanced to further the potential of telehealth, rapid changes have now allowed legal or ethical thought to determine appropriate protocols or new guidance to regulate telehealth and its ethical practice (Stanberry 2000). Outside from connectivity, telehealth programs must abide by the Health Insurance Portability and Accountability Act (HIPAA). Most laws affecting telehealth reimbursement and medical practice are state-level policies, but laws that protect

individual health information, such as HIPAA, are enacted and enforced by the federal government (Olson and Thomas 2017).

Health systems and medical professionals that use telehealth must be compliant of HIPAA regulations as well as regulations from the Health Information Technology and Economic Clinical Health Act (HITECH). The goals of HITECH are two-fold: to promote meaningful sharing of health information and health information technology while authorizing substantial civil and criminal penalties when health systems or practitioners do not adequately protect patient privacy. Under these two acts, anyone who is able to access protected health information at the origination site, the distant site, and during data transmission is subject to HIPAA and HITECH provisional consequences. With this in mind, health systems and organizations need to remember that all personnel with access to this information need to be trained properly to avoid accidental information disclosure (Olson and Thomas 2017).

HIPAA compliance can present many challenges to telehealth implementation. Video conferencing features have posed a significant problem to HIPAA compliance. For example, FaceTime, or other similar applications, are generally not considered HIPAA compliant. Healthcare organizations or private telehealth companies are putting themselves at risk if they do not utilize properly encrypted software that is HIPAA compliant. Similar to video conferencing on personal devices, other personal data that can be used for telehealth purposes are photographs taken by the patient themselves, which can allow for misuse of health information if those photographs are not sent and stored properly. Photographs often contain personally identifiable information including scars or tattoos if the picture itself does not show the patient's face (Olson and Thomas

2017). HIPAA regulations are evolving to adapt to changes in technology and advancements in mobile security. In 2014, it was estimated that 25 to 50 percent of all transactions in healthcare will be electronically outsourced by 2020 (Weinstein et al. 2014). But as we get closer to that the 2020 date, we find that telehealth is still burdened by many barriers that have hindered its growth.

Similar to telehealth, Electronic Medical Records (EMRs) also saw barriers to implementation due to many of the same reasons, but particularly due to concerns about information security. Information security is an important safeguard to ensure consumers, so when new technologies allow for changes and advancement in healthcare, there is a need to educate patients that these advancements are safe and protect health information. Although EMRs took a couple of years to see full implementation, most all hospitals and health systems in the United States use EMRs, and this could be a hopeful parallel in the quick and safe implementation of telehealth.

CONCLUSION AND DISCUSSION

I began this thesis with the intention of learning more about the origins and progression of telehealth and to begin to understand the opportunities that telehealth could provide for the future of healthcare around the world and in Mississippi. Through this literature review and original research, I have found that telehealth does have the potential to lift burdens of access to care across the nation, but there are still barriers that prevent full implementation of this emerging method of healthcare delivery. I have also found that healthcare needs in Mississippi are much like healthcare needs in other rural areas of the United States, but also very different in that Mississippi is a very unique state for healthcare. With low literacy and education rates and high rates of obesity and food insecurity, it is significantly harder to come up with effective solutions to address the healthcare needs in Mississippi in a state with constant problems with access to care.

When comparing Mississippi to the rest of the United States, we see similar barriers to implementation, specifically with reimbursement issues. The contacts at each site visit all mentioned problems with legislation that prevent telehealth from fully being implemented within their health system, clinic, or hospital. With the need for updated and efficient policy, the next topic each contact mentioned was the need for more research and lobbying for telehealth efforts. Hospitals and health systems across Mississippi are looking for students, researchers, politicians, investors, and other stakeholders to take interest in telehealth and to help push the healthcare agenda in Mississippi.

The University of Mississippi Medical Center's Center for Telehealth leads the way for telehealth in Mississippi, and provides other hospitals, clinics, schools, universities, businesses, and private companies with resources to implement telehealth

and provide care for those constituents. The Center for Telehealth has been successful due to their reach within the state and their years of service dedicated to growing this system of care in Mississippi. When comparing Mississippi to the United States, we see that Mississippi is advanced in its telehealth knowledge and capabilities. Mississippi leads the country in use of telehealth and strategies for telehealth, and we are often a model for telehealth programs and implementation in other states. This is likely due to the combination that Mississippi is rural, has significant health problems for the majority of the population, and has severe poverty rates that, together, combine and make Mississippi a unique place for a new system of healthcare delivery.

During the literature review process, I did not expect for telehealth to have such an extensive history. This is not a new subject, but it is strange that not many know about telehealth and the services it provides. I find it very interesting and a little alarming that many who asked about my thesis topic had never heard of telehealth at all. When I began to explain the broad definition of telehealth, many realized that they actually had been offered telehealth services or had used telehealth services in a recent encounter with a practitioner and did not even realize that the service they received was indeed telehealth. This is another very common barrier of telehealth in Mississippi and nation-wide; not many people know about telehealth or have an understanding that this is a new method of care. Even as the world moved towards convenience, many people are too comfortable in their traditional healthcare to see that there are new and emerging options to increase convenience and access and decrease costs.

Among the things I learned from this research were that telehealth is very hard to define and describe, but because there are so many applications and variations, it is an

easy concept to understand. As mentioned in the literature review, there is no simple or common definition for telehealth. I also found it difficult that telehealth and telemedicine were used so interchangeably in many articles and media, which is why I chose to simplify my research by only using telehealth. Along with the many definitions came the many categories of telehealth and putting telehealth services into categories became a very daunting task. There are an unlimited number of applications for telehealth, and there is no way to put one application into one category because it probably will fit into another category as well.

With my interest in healthcare administration, I found this thesis research to be very exciting. With each interview, I learned that there are passionate people in healthcare who understand what their hospital or health system needs, but there are barriers to implementation that are simply out of the administrator's hands. Telehealth is in need of more local, state, and national advocacy in order for policies to be updated and benefit patients and the health system. But even with the research available, I found that there was a limited number of resources on current bills and legislation that improve access to telehealth. Although I found a variety of resources on telehealth policy, they all seemed to come from 2014, 2015, or 2016, which was a barrier in my own research. While I was able to find current legislation concerning telehealth, there is not current research or analysis that goes into these policies to see if they were effective in increasing access to healthcare through telehealth. It is my hope that this thesis research is a call to action for students, researchers, activists, and readers that there is need for change in the United States healthcare system, and telehealth can provide effective and equitable solutions for improving access to care across the nation.

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APPENDIX

APPENDIX A Institutional Review Board Documents and Forms.....81

Abbreviated IRB Application

Interview Information Sheet

Recruitment Script

Snowball Sampling Script

APPENDIX B Bibliography Categories.....91

APPENDIX C Original Site Visit Notes.....92

UMMC Center for Telehealth

James C. Kennedy Wellness Center

North Sunflower Medical Center

APPENDIX D Experiential Learning in Telehealth Final Report99

APPENDIX A

Abbreviated IRB Application



The University of Mississippi
Office of Research and Sponsored Programs
Division of Research Integrity and Compliance - Institutional Review Board
100 Barr Hall - University, MS 38677
irb@olemiss.edu 662-915-7482

Screening / Abbreviated IRB Application

Purpose: Many studies qualify for an abbreviated review, according to the federal regulations and university policy.

- Part I of this form screens for a brief review.
- Part II of this form completes the abbreviated IRB application.
- Part III of this form gives instructions for obtaining the required assurances.
- The IRB makes the final determination on whether you must fill out a full application.

Always download the most recent version of this form: <http://www.research.olemiss.edu/irb/protocol/forms>.

Prepare and send application form as a **Word** document. **E-mail the completed form and attachments (and forwarded email assurance if PI is a student) to irb@olemiss.edu.**

Note: Some class project studies may qualify for a classroom waiver of IRB Application. Instructors: see form [here](#).

PART I — Screening

1. Do any of the following apply to your study?

Research Methods:

- Treatment study Yes No
- Exercise Yes No
- X-rays Yes No
- Collection of blood, urine, other bodily fluids, or tissues Yes No
- Use of blood, urine, other bodily fluids, or tissues with identifiers Yes No
- Use of drugs, biological products, or medical devices Yes No

Targeted Subjects:

- Prisoners Yes No

Elements of Deception:

- The study uses surreptitious videotaping Yes No
- The study gives subjects deceptive feedback, whether positive or negative Yes No
- The study uses a research confederate (i.e., an actor playing the part of subject) Yes No

If you checked Yes to any of the above, STOP HERE and fill out the FULL IRB APPLICATION FORM.

2. Questionnaire or Survey? (include questionnaire or survey as an attachment) Yes No

If Yes, answer 2a and 2b.
If No, proceed to 3.

- a. Anonymous?* Yes No
- b. Sensitive Information?* Yes No

If you answered No to 2a AND Yes to 2b, STOP HERE and fill out the FULL IRB APPLICATION FORM.

***Anonymous or Confidential?** Anonymous means (1) the investigator cannot associate a subject with his/her data, and (2) the data cannot identify a subject. *Examples:* Surveys with no names handed to an investigator are not anonymous; surveys placed by the subject in a group data envelope can be anonymous; surveys with no names and with demographic data that can identify a subject (e.g., the only African-American in a class) are not anonymous. By definition, interviews are NOT anonymous.

***Sensitive Information?** Sensitive information includes but is not limited to (1) information that risks damage to a subject's reputation; (2) information that involves criminal or civil liability; (3) information that can affect a subject's employability; and (4) information involving a person's financial standing. *Examples:* Surveys that ask about porn use, drug use, religion, use of alcohol while driving, AIDS, cancer, etc. may contain sensitive information.

If using Qualtrics for anonymous surveys, see [guidance here](#).

3. The ONLY involvement of human subjects will be in the following categories (check all that apply):

- 1) **Educational Research:** Research conducted in established or commonly accepted educational settings, involving **normal educational practices**, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
- 2) **Surveys, Interviews, Tests:** Research involving the use of published, standardized educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation. Minors are **NOT** exempt under this category.
- 3) **Surveys, Interviews, Tests with Public Officials:** Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
- 4) **Existing Data:** Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.
- 5) **Evaluation of Public Service Programs:** The study is conducted pursuant to specific federal statutory authority and examines certain federal programs that deliver a public benefit [call IRB for details if you think your study may fit].
- 6) **Food Tasting/Evaluation:** Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

Additional UM exempt categories: Must meet all criteria from IRB Policy RSP.301.015

- UM 7) **Behavioral Tasks/Games:** Studies of adults employing behavioral task performance methods or behavioral games, such as computerized economics, business, and accounting simulations of real-world transactions and innocuous online or in-person surveys that employ experimental manipulations (e.g., exposure to different written or video scenarios)
- UM 8) **Surveys with minors:** Studies that include minors as subjects and do not collect sensitive information: 1) online surveys, 2) in-person focus groups, and 3) surveys conducted in a group setting

Study methods beyond those above (including those involving experimental manipulations) will likely require a [FULL IRB APPLICATION FORM](#).

PART II — Abbreviated Application

4. Project Title: **Telehealth in Mississippi**

5. Principal Investigator: Dr. Ms. Mr. **Kate McGurn Centellas**

Department: **Department of
Sociology and Anthropology**

Department Chair's email (for cc of approval):
kdelling@olemiss.edu

Work Phone: **662-915-7129**

Home or Cell Phone: **312-231-6151**

E-Mail Address: **kmcentel@olemiss.edu**

If Principal Investigator is a student:

Graduate student:

- Dissertation Master's thesis
 Other graduate project

Undergraduate student:

- Senior thesis: SMBHC
 Croft Institute
 Other
 Other undergraduate project

Research Advisor:

(required for student researchers)

Department: [REDACTED]

Work Phone: [REDACTED]

E-Mail Address: [REDACTED]

Home or Cell Phone: [REDACTED]

6. List ALL personnel involved with this research who will have contact with human subjects or with their identifiable data. All personnel listed here must complete [CITI training OR the Alternative to CITI \(ATC\) training](#) before this application will be processed*.

NAME	FACULTY OR STAFF	GRADUATE STUDENT	UNDER-GRAD STUDENT	ROLE ON PROJECT	Training completed: CITI or ATC	
PI Kate Centellas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Researcher	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Advisor Kate Centellas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Researcher	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ann Weston Sistrunk	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Researcher	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Seema Murugan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Researcher	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If space is needed to list additional project personnel, submit [Appendix A](#).

*See [Exempt Human Research Policy](#) for training exceptions

7. Funding Source:

Is there funding for this project? Yes ⇒ No

If Yes, is the funding:

Internal: Source: [REDACTED]

External: Pending/Agency: [REDACTED]

Awarded/Agency: [REDACTED]

PI on external funding: [REDACTED]

Research Methodology/Procedures

8. Check all procedures below that apply to your study:

- Pre-existing data or biological samples ⇒ ⇒ ⇒
- Observation
- Oral history
- Interview ⇒ ⇒ ⇒
- Focus group ⇒ ⇒ ⇒
- Questionnaire or survey ⇒ ⇒ ⇒
- Audio recording or videotaping ⇒ ⇒ ⇒
- The study has misleading or deceptive: ⇒ ⇒ ⇒
 - (1) study descriptions;
 - (2) procedure explanations; and/or
 - (3) survey instructions/rationales.

Source of data: **Literature Review**

Do data/samples have identifiers? Yes* No

*If recording identifiers, you must fill out the [Full Application Form](#)

Attach interview questions.

Attach topic and questions.

Attach questionnaire or survey.

If online, state program to use (e.g., Qualtrics): [REDACTED]

Use and attach a [release form](#) if you plan to disseminate **quoted** comments or taped content. (This covers you and UM legally - Not for IRB purposes)

In the abstract, provide complete details and a rationale for employing misleading/deception information. Include [Appendix D](#) in your attachments.

9. Consent Procedures:

- Oral ⇒ ⇒ ⇒
- Information Sheet/Cover Letter ⇒ ⇒ ⇒
- Not applicable, Explain:

Attach script.

Attach. (No subject signatures required, see [example here](#): Go to Examples and Templates, then 'Sample Information Sheet')

10. Project Summary

Briefly summarize your project using non-technical, jargon-free language that can be understood by non-scientists. See <http://www.research.olemiss.edu/irb-forms> for abstract examples.

Give a brief statement of the research question supporting the reasons for, and importance of, the research: **The delivery of healthcare is rapidly changing to fit a more technological and advanced sytem of healthcare. This research will look at telehealth and develop topics, themes, and questions to understand this new healthcare model. This research will look at Telehealth in Mississippi and develop topics, themes, and questions to understand this new healthcare model and eventually begin to gain funding, research benefits, and implement these programs across Mississippi.**

Describe the ages and characteristics of your proposed subjects and how you will recruit them (attach recruitment script or materials to the application): **All subjects will be over the age of 18 and may include college students, healthcare professionals, physicians, patients, and members of potential telehealth program sites. Subjects will be recruited via email. See attached text. We will begin with UMMC Telehealth partner providers and ask them to refer additional participants to us (snowball sampling).**

For studies using only adult subjects, state how you will ensure they are 18+:

- First question on survey/interview
- Other:
- Not applicable

Briefly describe the research design: **The first aspect of research will be to analyze existing secondary resources to gather relevant information to conduct original research through interviews. The interview process will be conducted orally and will not disclose any personal information, but with gather information regarding attitudes, ideas, wants, and perceptions of Telehealth. Followng the interview process, the researchers will gather results and begin to extrapolate relevent data to build a report to combine the existing secondary research to the original empirical research. This research will be a combination of original empirical data collection, literature review of secondary sources, and will culminate in developing original themes and conclusions.**

Give a detailed description of the procedure(s) subjects will undergo (from their perspective): **Participants will be notified of project goals and procederes the participant must go through. The patricipants will be asked questions by the researcher, and the questions will be modified based on each participant's responses. The interview questions are not constant as each interview will be conducted conversationally.**

11. Appendix Checklist:

- A. Additional Personnel not listed on first page of application?
 No Yes – complete [Appendix A](#)
- B. Will the research be conducted in schools or child care facilities?
 No Yes – complete [Appendix B](#)
- C. Does your research involve deception or omission of elements of consent?
 No Yes – complete [Appendix D](#)
- D. Will your research be conducted outside of the United States?
 No Yes – complete [Appendix E](#)
- E. Will your research involve protected health information (PHI)?
 No Yes – complete [Appendix E](#) if applicable

12. Attachments Checklist:

Did you submit:

- a. survey or questionnaires?
 Yes Not Applicable
- b. interview questions?
 Yes Not Applicable
- c. focus group topics?
 Yes Not Applicable
- d. recruitment email, announcement, or script?
 Yes Not Applicable: No subject contact
- e. informed consent information letter or script?
 Yes Not Applicable: No subject contact
- f. permissions for locations outside the University?
 Yes Not Applicable
13. If using class points as incentives, are there alternative assignments available for earning points that involve comparable time and effort?
 Yes Not Applicable
14. If using an anonymous survey through Qualtrics and giving incentives in a separate survey, have you read and conducted the testing of the surveys according to the [procedures here?](#)
 Yes Not Applicable

PART III: ASSURANCES
Conflict Of Interest And Fiscal Responsibility

Do you or any person responsible for the design, conduct, or reporting of this study have an economic interest in, or act as an officer or a director of any outside entity whose financial interests may reasonably appear to be affected by this research?

- YES ⇒ ⇒ If Yes, please explain any potential conflict of interest.
 NO

Do you or any person responsible for this study have existing financial holdings or relationships with the sponsor of this study?

- YES ⇒ ⇒ If Yes, please explain any potential conflict of interest.
 NO
 N/A

Principal Investigator Assurance

PRINCIPAL INVESTIGATOR'S ASSURANCE

I certify that the information provided in the application is complete and correct. As Principal Investigator, I have the ultimate responsibility for the protection of the rights and welfare of the human participants, conduct of the research, and the ethical performance of the project. I will comply with all UM policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of participants in human research, including, but not limited to the following:

- Informed consent will be obtained from the participants, if applicable and appropriate;
- Any proposed modifications to the research protocol that may affect its designation as an exempt (brief) protocol application will be reported to the IRB for approval prior to being implemented.
- Adverse events and/or unanticipated problems will be reported to the IRB as required.

I certify that I, and all key personnel, have completed the required initial and/or refresher CITI or CITI Alternative courses in the ethical principles and regulatory requirements for the protection of human research participants.

Typed signature/name of Principal Investigator

Date

RESEARCH ADVISOR'S* ASSURANCE (REQUIRED FOR STUDENT PROJECTS)

Email your Advisor with the following:

1. Email subject line: "IRB Advisor Approval Request from (your name)"
2. Your IRB submission materials as attachments
3. Copy and paste the statements below into the body of the email
4. Forward the reply email from your Advisor to irb@olemiss.edu along with your IRB submission materials attached.

***The research advisor must be a UM faculty member. The faculty member is considered the responsible party for the ethical performance and regulatory compliance of the research project.**

Please review my attached protocol submission. Your reply email to me will constitute your acknowledgement of the assurances below.

Thank you,
[type your name here]

As the Research Advisor, I certify that the student investigator is knowledgeable about the regulations and policies governing research with human participants and has sufficient training and experience to conduct this particular research in accordance with the approved protocol.

I agree to meet with the investigator on a regular basis to monitor research progress.

Should problems arise during the course of research, I agree to be available, personally, to supervise the investigator in solving them.

I will ensure that the investigator will promptly report incidents (including adverse events and unanticipated

problems) to the IRB.

If I will be unavailable, for example, on sabbatical leave or vacation, I will arrange for an alternate faculty member to assume responsibility during my absence, and I will advise the IRB by email of such arrangements.

I have completed the required CITI course(s) in the ethical principles and regulatory requirements for the protection of human research participants.

Interview Information Sheet

MODEL INFORMATION SHEET

Title: Telehealth in Mississippi

Investigator

Kate McGurn Centellas, Ph.D.
Department of Sociology and Anthropology
561 Lamar Hall
The University of Mississippi
(662) 915-7129

Advisor

Kate McGurn Centellas, Ph.D.
Department of Sociology and Anthropology
561 Lamar Hall
The University of Mississippi
(662) 915-7129

INCLUDE THE FOLLOWING ONLY IF YOU ARE COLLECTING DATA EXCLUSIVELY FROM ADULTS

By checking this box I certify that I am 18 years of age or older.

Description

The purpose of this research is to determine attitudes, ideas, wants, and perceptions of Telehealth in the state of Mississippi. We would like to ask you a few questions regarding Telehealth and its applications in Mississippi. You will not be asked for your name or any other identifying information.

Cost

It will take approximately 10-30 minutes to complete the interview.

Risks and Benefits

You may feel uncomfortable with some of the questions regarding experiences with healthcare and Telehealth. There are no other risks.

Confidentiality

No identifiable information will be recorded; so, you cannot be identified from this study.

Right to Withdraw

You do not have to take part in this study and you may stop participation at any time. If you start the interview and decide that you do not want to complete the interview, you may dismiss yourself from the interview. You may skip any questions you prefer not to answer.

IRB Approval

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at (662) 915-7482 or irb@olemiss.edu.

Statement of Consent

I have read and understand the above information. By completing the survey/interview I consent to participate in the study.

Recruitment Script

IRB Recruitment Script

Hello, our names are Ann Weston Sistrunk and Seema Murugan. We are both undergraduate Honors students at the University of Mississippi working on a research study about Telehealth in Mississippi with Professor Dr. Kate Centellas. You have received information about this study because of your previous participation in Telehealth programs, either as a patient or as a healthcare provider.

Would you be interested in participating in an interview to describe your experience with Telehealth? You are free to discontinue the interview and leave at any moment if you feel you should not continue.

Involvement in this research includes partaking in an interview about your attitudes, ideas, wants, and perceptions of Telehealth in the state of Mississippi. We would like to ask you a few questions regarding Telehealth and its applications in Mississippi. None of the questions ask for information that can be used to identify you. The interview will take approximately 10-30 minutes to complete based on the responses as the interview will be conducted conversationally.

If you have any questions or would like to participate in the research, we can be reached by email at awsistru@go.olemiss.edu or smurugan@go.olemiss.edu.

Snowball Sampling Script

Snowball Sampling

Current Participants:

Thank you for participating in our research on Telehealth in Mississippi. Would you be willing to give us information regarding other potential participants? There is no obligation for you to provide us with participants, and there will be no penalty if you do not provide any participant referrals. You also have the right to request confidentiality in that we will not reveal your identity when we contact the potential participants whom you have referred.

Potential Participants:

Hello, our names are Ann Weston Sistrunk and Seema Murugan. We are both undergraduate Honors students at University of Mississippi working on a research study about Telehealth in Mississippi with Professor Dr. Kate Centellas. You have received information about this study because of your previous participation in Telehealth programs, either as a patient or as a healthcare provider. Your name was passed along to me by UMMC Telehealth partner providers.

Would you be interested in participating in an interview regarding your experience with Telehealth? You are free to leave at any moment during the interview if you feel you should not continue.

Involvement in this research includes partaking in an interview about your attitudes, ideas, wants, and perceptions of Telehealth in the state of Mississippi. We would like to ask you a few questions regarding Telehealth and its applications in Mississippi. None of the questions ask for information that can be used to identify you. The interview will take approximately 10-30 minutes to complete based on the responses as the interview will be conducted conversationally.

If you have any questions or would like to participate in the research, we can be reached by email at awsistru@go.olemiss.edu or smurugan@go.olemiss.edu.

APPENDIX B

Zotero Bibliography Categories

The screenshot displays the Zotero application window. On the left is a sidebar with a file tree and a list of tags. The main area shows a table of bibliography entries with columns for Title, Creator, and a status indicator.

Title	Creator	Status
▶ Telehealth Among US Hospitals: Several Factors, Including State Reimbursement And Licensure...	Adler-Milstein et al.	
▶ Aligning Concerns in Telecare: Three Concepts to Guide the Design of Patient-Centred E-Health	Andersen et al.	
▶ Digital Health Education for the Fully Online College Student: An Exploratory Study	Armstrong and Burcin	●
▶ Effects and barriers to deployment of telehealth wellness programs for chronic patients across ...	Barberan-Garcia et al.	
▶ School-based Telehealth Programs: Integration and Process	Bruce	●
▶ Understanding Campus Mental Health Services and the Campus System of Care	Chan	
▶ Investigating healthcare professionals' decisions to accept telemedicine technology: an empiric...	Chau and Hu	●
▶ Exploring the factors that influence the decision to adopt and engage with an integrated assist...	Cook et al.	
▶ Meeting the mental health needs of today's college student: Reinventing services through Step...	Cornish et al.	●
▶ Remote Patient Management: Technology-Enabled Innovation And Evolving Business Models F...	Coye et al.	
▶ Care Coordination/Home Telehealth: The Systematic Implementation of Health Informatics, Ho...	Darkins et al.	
▶ Ambulatory Hemodynamic Monitoring Reduces Heart Failure Hospitalizations in "Real-World" C...	Desai et al.	
▶ Telepsychiatry in Correctional Facilities: Using Technology to Improve Access and Decrease Co...	Deslich	
▶ State of Telehealth	Dorsey and Topol	
▶ Connecting Patient Centered Care for Chronic Conditions to School-based Clinics through Tele...	Dunfee	
▶ Methodologies for assessing telemedicine: A systematic review of reviews	Ekeland et al.	●
▶ Barriers to the up-take of telemedicine in Australia - a view from providers	Eley	
▶ Speech-language pathology telehealth in rural and remote schools: the experience of school ex...	Fairweather et al.	●
▶ Telemedicine and Remote Patient Monitoring	Field	●
▶ The Use of Telemedicine to Evaluate Competency to Stand Trial: A Preliminary Randomized Co...	Gina M. Manguno-Mire et al.	
▶ Examining the Technology Acceptance Model Using Physician Acceptance of Telemedicine Tec...	Hu et al.	●
▶ Use of Telehealth for Research and Clinical Measures in Cochlear Implant Recipients: A Validati...	Hughes et al.	
▶ Introducing Telemedicine Technology to Rural Physicians and Settings	James D. Campbell, PhD et al.	●
▶ A Comparison Between Telehealth and Face-to-Face Brief Alcohol Interventions for College Stu...	King	●
▶ Effects of Home Telemonitoring Interventions on Patients With Chronic Heart Failure: An Overvi...	Kitsiou et al.	
▶ Ubiquitous Computing for Remote Cardiac Patient Monitoring: A Survey	Kumar et al.	●
▶ Connected Health: A Review Of Technologies And Strategies To Improve Patient Care With Tele...	Kvedar et al.	
▶ Prison Telemedicine and Telehealth Utilization in the United States: State and Federal Perceptio...	Larsen et al.	
▶ A Surgical Telemedicine Clinic in a Correctional Setting	Lavrentyev et al.	
▶ School Health Services to Meet Adolescent Needs in the USA	Maughan and Bergren	
▶ Video-conferencing Telehealth Linkage attempts to Schools to Facilitate Mental Health Consult...	McLennan	
▶ Telehealth	Olson and Thomas	
▶ Effectiveness of Remote Patient Monitoring After Discharge of Hospitalized Patients With Heart...	Ong et al.	●
▶ Diagnosis at a distance: the invisible work of patients and healthcare professionals in cardiac te...	Oudshoorn	
▶ Structural Violence and Clinical Medicine	Paul Farmer et al.	
▶ Medicare allows more benefits for chronically ill, aiming to improve care for millions	Pear	
▶ Telehealth in Context: Socio-technical Barriers to Telehealth use in Labrador, Canada	Peddie	
▶ Telemedicine Technology and Clinical Applications	Perednia	●
▶ Telemedicine compared with standard care in type 2 diabetes mellitus: A randomized trial in an ...	Rasmussen et al.	
▶ Telehealth in the School Setting: An Integrative Review	Reynolds and Maughan	●
▶ Exploring barriers to participation and adoption of telehealth and telecare within the Whole Syst...	Sanders et al.	
▶ Telehealth: Current Barriers. Potential Progress	Schumacher	

Tags in Sidebar: alcohol intervention, assessment, background, barriers, best practices, children/adolescents, chronic disease, chronic illness, clinical practice, comparative, COPD, cost, counseling, diabetes, ethics, global, health promotion, heart disease, home health, implementation, insurance, mental health, mental health services, models, online, patient provider relationship, perceptions, prison, reference, remote patient monitoring, reproductive health, review, review of reviews, rural, schools, schools/colleges, seema, surgery, telemonitoring, video-conference, video-conferencing.

APPENDIX C

UMMC Center for Telehealth Notes

Ann Weston Sistrunk
HON 420
10 July 2018

UMMC Telehealth – Notes

1. Goals and Needs
 - a. Maintain National Telehealth Center of Excellence status
 - i. FCC commissioners and Senator Wicker to announce \$100 million in funding for Telehealth programming for rural Mississippi
 - b. Need to develop research plans or potential projects to help rural Mississippi communities
2. Potential Projects
 - a. Sunflower County Remote Patient Monitoring Transition
 - i. Follow-Up on original patients from the original RPM study
 - ii. Longitudinal study of what happens after the RPM programs in the Mississippi Delta
 - iii. Questions
 1. Are they able to maintain their chronic illnesses without the support of a Telehealth nurse or provider?
 2. Was the education provided through the RPM program enough to create lasting behavioral changes?
 3. Is follow-up education necessary to provide a transition period after the RPM program?
 - iv. Methods
 1. Interview/Survey as to how each patient is maintaining their chronic illness without being in the RPM program, and resources that may continue to be beneficial through the transition process.
 - b. Data Collection for School-Based Telehealth Programs
 - i. Policy changes to provide a sustainable method to get Telehealth into schools and grants to provide funding for school health programs
 - ii. Current Program
 1. Quitman, MS Pilot
 - a. Need data collection and analysis to further develop and sustain Telehealth program
 - iii. Methods
 1. Data collection and analysis via statistical methods
 2. Policy
 - a. Develop sustainability plan
 - b. Develop lobbying plan to change administrative code to allow schools to be a cite for reimbursement
 - c. New Remote Patient Monitoring Projects
 - i. Need to review expired or existing RPM programs and begin new programs, both in rural and urban areas
 1. Need guidance from UMMC Telehealth Center as to which programs are most needed or what they currently need with existing RPM programs
 - ii. Potential new RPM Projects

1. Monitoring chronic illness and providing education through RPM for high school and college students
 - a. Will allow for more independence and self-control of their own disease
2. Review of current or expired RPM programs, includes both rural and urban populations
 - a. Mississippi Delta
 - i. Sunflower County
 - b. Jackson

James C. Kennedy Wellness Center Notes

Ann Weston Sistrunk
HON 420
27 July 2018

James C. Kennedy Wellness Center – Charleston, MS

1. Background
 - a. Tallahatchie County rated 2nd lowest for healthcare disparities
 - b. Comprehensive health needs assessment provided valuable information for a grant
 - i. Kennedy grant for the Wellness Center
 - c. Mission of the center is to provide management and education of chronic diseases, primarily focusing on diabetes, obesity, and quality of care for the chronically ill
 - d. Clinic open 8am-9pm Monday-Friday
 - i. PT/OT
 - ii. Wound care
 - iii. Emergency
 - iv. Pediatricist
2. Community Needs
 - a. Need for wellness in the community because of high rates of chronic disease and lack of health education about diseases
 - b. Telehealth for specialty care
 - i. Diabetes
 - c. Patients have to travel to larger cities to receive any sort of specialty care
 - i. Jackson
 - ii. Memphis
 - iii. Batesville/Oxford
3. Current Telehealth Usage
 - a. Not a priority
 - b. Delta Health Alliance provides assistance now
4. Telehealth Needs
 - a. Proposal for equipment from the USDA
 - b. Diabetes RPM programming
5. Barriers
 - a. Universal understanding of Telehealth
 - b. Capabilities
 - c. Billing/reimbursement
 - d. Equipment funding
 - e. Accessibility
6. Potential Research
 - a. How ACO impacts Telehealth
 - i. ACO is reimbursed for Quality of Care
 - b. Cost-savings for preventative medicine
 - i. Diabetes screening
 1. Catching undiagnosed or pre-diabetes
 - c. Dietary interventions and food resources
 - d. Behavior health

- i. Overcome travel and practitioner barriers
 - e. Labs
 - f. Policy for reimbursement/lobbying for needs
 - i. Lobbying for rural MS interests
 - ii. Engaging in health communication
 - 1. How do we engage in health communication in Mississippi to better our needs and get people involved?
 - a. Funding
 - b. Grants
 - c. Report of successes
7. Reflection
 - a. Barrier of Telehealth understanding
 - i. How can we get practitioners, patients, policymakers, insurance companies, etc. on the same page regarding Telehealth?
 - b. Reimbursement is a constant issue of Telehealth
 - i. Different for schools, clinics, hospitals, etc.
 - ii. Policy is the driver, but lobbying is the gas
 - c. How can telehealth save money and prevent disease?
 - i. The goal of these programs
 - ii. But how can we portray this to policymakers and stakeholders?
 - d. Diabetes, obesity and chronic disease management is a constant need in MS, regardless of rural or urban communities
 - i. Telehealth programs have shown success
 - 1. Need grant, funding to implement these programs elsewhere

Telehealth in MS - Sunflower County

1) What does telehealth look like in Sunflower County now, and for the future - what does this community need?

- Telemedicine in the ER, Teledermatology, lobbying for Telehealth, RPM for diabetics
- RPM costs were more than 75,000 for the hospital after grants + state help.
- Plans: phone + tablet (RPM, cell phones to be primary, Cardio EKGs via phones, working w/ specialty groups)
- Hybrid approach - cardiologist is here, but monitoring and other specialties are via technology
- Teletherapy, tele psychiatry - they WANT dermatology
- Student help, what can we do?? They have the technology, but ask Sam via email to ask the legislator what is needed, lots of lobbying + reimbursement issues

2) In regards to RPM programs, what did those look like, how have patients transitioned, and what were some challenges and successes with those programs?

- Tablets created a problem in the RPM program,
- IRB took time, GE started, Cspire + MS departments of health
- Visit North Ms medical center on the frontlines of telehealth (11 rural health clinics)
- DataSpace Company (commercial product for Primary healthcare via telehealth, hasn't come to MS but they have models that would be beneficial to look at.

3.) Rural MS has seen many hospitals close, or close to closing, like in Greenwood. How can telehealth potentially replace this, or how could it better the situation?

* Ask about cart demo with BD exist.

↳ The carts were having trouble (Escan) going from place to place but they need to be more stationary.

↳ (4.) What has been your experience in reimbursement and other logistics associated with telehealth?

- Medicaid - telehealth can only be an origination site for the rural health clinic, but we need distance
- Email Sam Miller for legislative email to talk about reimbursement, ask Joanie for address codes.
- Ryan Kelly @ Miss. rural health association
- Grant money is not enough, needs to be lobbied
- For telehealth to work, it needs to pay for itself and be sustainable, HPSA - needs to meet the needs.
- Blue cross & Medicaid is the best source to get reimbursed

MS-HIN (Health information exchange network)
Mississippi - Mike Garcia, send Joanie email.

Dr. Henderson

A.) Overview of background, the hospital + programs, and how Telehealth in this area came to be?

How has it been so impactful, driving factors in its success?

- UMMC Telehealth for 11-12 years; "Telemedicine" began in the ER to get providers into rural Mississippi
- Diabetes telehealth project - trying to replicate and find a way to pay for it; RPM signed the MOU to continue
- Joanne began with Telepsyc in Indianapolis center

B.) Talk about the North Sunflower Medical Center and your role here.

- Critical access hospital - 25 beds only (96 hr. stay)
 - Large outpatient population with specialties from Q+Jax.
 - Rural health clinic 3500-4000 visits a month, 4 doctors, 8 nurses, 12 part-time staff; 24-hr ER services
 - Clinic is open 10-hrs a day, 7 days a week
 - 60 bed nursing home attached to hospital; 7 surgeons in the unit?
 - Swing bed (rehab hospital) 7 days a week, Rural health clinic has helped with non-urgent patients in the ER, large primary care footprint in the Delta, full lab/radiology/physical
 - Health fairs to help with community, WANT Tele dermatology but Medicaid does not pay for "store and forward"
- * Joanne Perkins + Sam Miller

APPENDIX D

Experiential Learning in Telehealth Final Report Notes



**Sally McDonnell Barksdale
Honors College
The University of Mississippi**

Experiential Learning in Telehealth – Final Report
Ann Weston Sistrunk

Through my thesis research process, I was given the opportunity to work with Dr. Kate Centellas on a Telehealth experiential learning course designed to help broaden my knowledge of Telehealth and eventually provide tangible support and original research for my thesis work. This honors course provided opportunities to speak with experts on Telehealth in Mississippi in the field, which led our group to travel to the University of Mississippi Medical Center in Jackson, the James C. Kennedy Wellness Center in Charleston, and North Sunflower Medical Center in Ruleville. The following document will provide a short synthesis on the common themes that emerged through these visits regarding Telehealth in Mississippi.

Of the many barriers to Telehealth discussed, the barrier of Telehealth understanding became a prevalent topic in the conversation on how practitioners, policymakers, and insurance companies must be on the same page regarding Telehealth for it to be successful. There is a gap between the people who are implementing Telehealth measures, the people paying, and the people who need access to Telehealth. It is common for providers to lack trust in Telehealth delivery in terms of its legal, ethical, and payment structures, which causes a problem with Telehealth implementation if providers do not understand these structures. This begs the question, how can we get practitioners, patients, policymakers, and insurance companies on the same page regarding Telehealth? Explanation and proper implementation of Telehealth reimbursement procedures are an answer, but it is also a barrier, as described in the next theme.

Reimbursement was the most common, reoccurring theme of all three site visits. Reimbursement is a constant issue in Telehealth administration, and state and federal laws both play a role in this issue, making reimbursement even more complicated. Best described by Dr. Catherine Woodyard Moring of the James C. Kennedy Wellness Center, policy is the driver, but lobbying is the gas for this issue. Many Telehealth programs in Mississippi rely on grant funding, as insurance companies and administrative codes are not properly assigned or “labeled” to pay for Telehealth, but grant funding is not enough. Many hospitals and health systems catch the burden of funding Telehealth programs, which are very expensive because of these current policy issues. It became clear that for Telehealth to work in Mississippi, it needs to pay for itself and be sustainable, and we need to portray to policymakers and other stakeholders that Telehealth will save money and prevent disease, all while providing exceptional patient care.

Along with administrative barriers in Telehealth, there is common sentiment on the kinds of research needed in Mississippi to begin to implement projects to improve healthcare and provide needed documentation to fuel lobbying and policy efforts. Diabetes, obesity, and chronic disease management are a constant need in Mississippi, regardless of rural or urban communities, and Telehealth programs have shown success in managing chronic illnesses. More research is needed to develop and review Remote Patient Monitoring programs to allow patients to manage their chronic illness from home, educate patients on how to take care of their health, and allow patients to spend less time in clinics and hospitals. The next steps to take include these research topics, and lobbying efforts to change legislation to benefit Telehealth delivery in Mississippi and across the nation.