Covid19: The Global Health Crisis and Telemedicine's Role in Maintaining Access to Outpatient Care

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Abstract

On March 20th, 2020, SARS-CoV-2, more colloquially known as Covid19, was a global pandemic event that shook the world and defined life for more than a year. It effected economies, businesses, and people taking a toll on both their mental and physical health. The United States largely went into lockdown and shut down public spaces to minimize the risk of exposure and "flatten the curve." The lockdown further impacted businesses and people; having a profound impact on the healthcare sector which was not exempt from these policies. Public health agencies, healthcare organizations, and government institutions faced incredible uncertainty as they began to treat Covid19 patients and decided how best to quarantine them from other patient populations while still providing care to their communities.

Telemedicine is a technology and framework for connecting providers and patients virtually. It had been long on the backburner for implementation in the healthcare sector but would come to the forefront under these challenging circumstances. This essay will explore the benefits and challenges of implementing the technology in such a rapid fashion as well as the long-term outlook for its sustained use.

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PREFACE

I would like to acknowledge the University of Pittsburgh Graduate School of Public Health and the Department of Health Policy and Management and all who helped make this accomplishment possible. I would like to specifically acknowledge Prof. Paone and Prof. Kimpel for their support and guidance throughout this project.

1.0 INTRODUCTION

March 20th, 2020 will go down in infamy, as SARS-CoV-2 (Covid19), a decade defining health crisis was announced by the World Health Organization as a global pandemic. The impacts of Covid19 were felt around the world challenging countries, local governments, and people to rapidly adapt to an unknown and ever-changing situation (Ballotpedia, 2021). In the United States, the federal government's first response under President Trump was to announce a travel ban from China by foreign nationals on January 31st, 2020, extending the ban for foreign nationals to Iran and issuing "do not travel warnings" for Italy and South Korea on February 29th, 2020. This trend of closing off the United States' borders would continue through the year (Ballotpedia, 2021).

A national emergency was declared on March 13th, 2020 under the Stafford Act followed by an announcement of social distancing guidelines that encouraged "limiting gatherings to fewer than 10 people, avoiding eating and drinking in bars and restaurants, and avoiding unnecessary travel (Ballotpedia, 2021)." As early as March 19th, 2020, state governments began issuing shutdown orders for non-essential businesses attempting to "flatten the curve" and prevent spikes in Covid19 cases which were predicted to overwhelm hospitals and healthcare systems (California for all, 2021). These restrictions would extend to healthcare facilities and hospitals, limiting visitors for inpatients, implementation of screening processes, requiring Personal Protective Equipment (PPE) when engaging with patients, etc. However, the strain of

PPE shortages and anxieties of Covid19 breakouts among healthcare workers would demand that healthcare organizations innovate to deal with the developing situation (CDC, 2021).

1.1 BACKGROUND OF COVID19

The first case of SARS-CoV-2 (Severe Acute Respiratory Syndrome Corona Virus 2), commonly known as Covid19, was documented in December 2019 in Wuhan city of the Hubei Province in China. Patients began appearing at hospitals with severe pneumonia of unknown origin. These cases were linked to the Huanan wholesale seafood market which also served as a marketplace for live animals (Singhal, 2020). In response, respiratory samples were taken from patients for investigation. Following laboratory studies, the mystery virus was identified as a novel zoonotic coronavirus originating in bats transmitted to humans through an unknown intermediary and linked to the Huanan Sea Food Market (Singhal, 2020). The unfortunate overlap between the first cases of Covid19 and the Chinese New Year, accelerated the spread of disease as massive amounts of people moved around China domestically and internationally for the holiday. Cases would continue to increase exponentially and become documented across the globe. As of April 16th, 2021, there had been over a staggering 138 million cases documented and 2.98 million deaths because of Covid19 worldwide (WHO, 2021).

Coronaviruses are positive sense RNA viruses enclosed in a 60nm to 140nm diameter capsule with a crown like appearance resulting from the spike-like projections on the virus surface. Covid19 is a novel virus of this coronavirus family (Singhal, 2020). It has been determined that the disease is transmitted through inhalation or contact with contaminated water droplets. Once contracted by a person the virus has an incubation period that ranges between two

to 14 days (Singhal, 2020). Most people who contract the virus will experience mild symptoms such as: fever; cough; sore throat; breathlessness; fatigue; malaise; and others (Singhal, 2020). However, in the elderly and individuals with comorbidities, the disease may progress from flu-like symptoms to pneumonia, acute respiratory disorder, and multi organ dysfunction. There is no treatment for Covid19; rather treatment is determined by the symptoms a person experiences and are supportive in nature (Singhal, 2020). Most people will recover from infection, the virus has a fatality rate of an estimated 2-3%. However, despite its unassuming risk to people, Covid19's true danger lies in how incredibly infectious it is and ability to infect others through asymptomatic individuals (Singhal, 2020). These traits are attributed to how Covid19 appeared in countries around the globe in such a relatively short amount of time (Singhal, 2020). Prevention, therefore, is key to controlling the spread of the virus through self-quarantine, social distancing by maintaining a 6ft distance between people in public spaces and droplet precautions through mask wearing (Singhal, 2020). Additionally, utilization of digital health tools such as telemedicine to treat patients at a distance would prove indispensable for disease prevention.

1.2 HISTORY OF HEALTH INFORMATION TECHNOLOGY

Healthcare Information Technologies (HIT's) are tools used in "the processing, storage, and exchange of health information in an electronic environment" (Office for Civil Rights, 2020). Implementation of HIT's in the United States has historically been a struggle. In a bid to get organizations to adopt health technologies, the government passed several incentive programs, most notably the HiTECH act, which encouraged healthcare organizations to implement HIT's and practice "meaningful use" (Health IT, 2021). In this context "meaningful use" meant that the

electronic health records (EHR's) that were implemented met the minimum US government standards of the way in which clinical patient data was exchanged by providers and patients. While this program was successful in pushing organizations to adopt EHR systems, they were wildly unpopular with physicians due to the additional effort required to prove "meaningful use" (Singh, 2016). Through the efforts of both the Centers for Medicare and Medicaid Services (CMS) and the Office of the National Coordinator for Health IT (ONC), the HiTECH program went through several iterations, where 'meaningful use' shifted to the Merit-Based Incentive Payment System (MIPS) that were consolidated with several other programs and modifiers to form the Medicare Access and CHIP Reauthorization Act under the HiTECH act in 2015 (Health IT, 2021).

Some of the largest barriers to HIT adoption were that smaller organizations did not have the experience in implementing complicated technologies into their practice, did not have the resources, or simply were not aware of what was available to them. Despite the pains of HIT's such as interoperability, usability and safeguarding digital health information, a literature review conducted by Buntin, Burke, Hoaglin, and Blumenthal (2011) uncovered that 92% of articles on HIT reported overall positive results at implementing organizations (Buntin et al., 2011). The realities of this paper highlight the need to study and understand how to make technology implementation more accessible; and how to do it intelligently to reach the full potential Health technologies have to offer. Of course, this would extend to modern telemedicine and contribute to why it has remained an obscure technology until the recent crisis.

1.3 WHAT IS TELEMEDICINE?

Telemedicine, as defined in the book “Introduction to Telemedicine” by Wooton, Craig, and Patterson (2017) is “the delivery of health care and the exchange of health-care information across distances…it encompasses the whole range of medical activities including diagnosis, treatment and prevention of disease, continuing education of health-care providers and consumers, and research and evaluation.” Telemedicine is not a new technology. It has seen use over the last 20-30 years. Under the strict definition of “medicine at a distance,” however, the earliest recorded use was during the middle ages where information about the bubonic plague was shared using bonfires (Wooton et al., 2017). The mid-19th century is when we would see our first jump in telemedicine technology with the advent of telegraphy, a primitive form of text messaging, that saw extensive use during the American Civil War (Wooton et al., 2017). Casualty lists, and medical supply orders could be placed using this technology and eventually even enable X-ray images to be transmitted. Skip forward to the later half of the 19th century and telemedicine would again be revolutionized by the telephone, which became a mainstay for healthcare (Wooton et al., 2017). Besides standard communication over the phone, other applications were also discovered such as sending amplified sounds of a stethoscope and transmitting electrocardiograms and electroencephalograms (Wooton et al., 2017).

Modern telemedicine would advance on two concurrent fronts. The first instigated by further advances in electronic communications. The second by the innovative efforts of individuals and organizations. For example, the high-tech interests of the National Aeronautics and Space Administration (NASA) and their manned space-flight program resulted in huge investments and interest in high tech ventures which would be instrumental in developing accessible commercial equipment for use by individuals (Wooton et al., 2017).

Another major influence on telemedicine was the invention of the television, where closed-circuit televisions (CCTV's) and video communications were utilized by medical professionals in a clinical setting. One example is the use of two-way CCTV's was to connect two institutes separated by 112 miles: the Nebraska Psychiatric Institute in Omaha, and the state mental hospital in Norfolk (Wooton et al., 2017). This connection enabled specialists to interact with each other and conduct virtual consults, as well as enable cross training and development between the two institutes. The development of mobile phones and satellite communication paired with increasing accessibility to such technologies would be the final piece leading up to modern telemedicine capabilities and its role in the global pandemic (Wooton et al., 2017).

1.4 TELEMEDICINE ADOPTION DURING A CRISIS

1.4.1 Barriers to Telemedicine Adoption and Usage

Telemedicine is a field of medicine that has clear benefits to, and in some cases no alternative regarding, patient treatment. For example, remote areas, airplanes, and ships are locations where it may be difficult, if not impossible, to render conventional medical care without telemedicine (Koonin et al., 2020). Telemedicine also promotes and increases access to care in rural areas circumventing the need for transportation and travel. Telemedicine has also been shown to be instrumental in helping patients maintain adherence to treatment plans and increase overall quality of care with clear financial benefits as well (Koonin et al., 2020). Despite, this high praise, the adoption of modern telemedicine has been slow and on the backburner for many organizations for decades. Between 1994 and 1996, the United States

government provided over $600 million in funding for telemedicine projects. These finance incentives included over 400 rural health facilities across 40 states increasing to another 500 facilities over the next 5 years (Paul et al., 1999). There was clear interest and motivation to grow telemedicine capabilities in communities that could utilize it. Reported low utilization, however, both clinically and non-clinically were below expectations with respect to the financial commitment (Paul et al., 1999). To put it into perspective, over 65% of rural health care facilities outfitted with telemedicine installations averaged about eight sessions per month. Extending telemedicine sessions to include administrative and educational applications, roughly 70% of facilities averaged less than 16 sessions per month. A key barrier that was often cited to telemedicine utilization were technological barriers (Paul et al., 1999).

A study conducted in by Paul, Pearlson, and McDaniel (1999) investigated three telemedicine projects for technology related barriers summarized in **Table 1** below.

TECHNOLOGY BARRIERS	Expected	Not Expected
Supported **Not Supported**	• End-User Training • Convenience • System Reliability	• Audio Transmission Quality
Supported But Not As Expected	• System Design • Patient Privacy And Confidentiality	

Table 1: Summary of Technology Barriers, Paul et al. 1999

Paul et al. classified technology barriers into 4 different categories:

1) Barriers identified in literature and supported by the study.
2) Barriers identified in literature but not supported by the study.
3) Barriers that were expected and supported by the study but not in the manner that was expected.
4) Unexpected barriers.

End-user training fell under the first category. To put it simply, physicians felt that they did not receive the appropriate training to utilize telemedicine technologies, preventing them from taking full advantage of the equipment. Other physicians felt that it was a barrier from using the technology at all (Paul et al., 1999).

The quality of video images, convenience and system reliability fell under the second category (Paul et al., 1999). Video image quality was suspected to be a barrier to telemedicine utilization and had been cited as such in previous literature. However, in this study video quality had surprisingly exceeded expectations and was universally deemed by clinicians to be more than sufficient for clinical needs. Convenience referred to how physically accessible telemedicine technology was to a staff member. It was also determined by the study to be a non-issue and many rural health practitioners were satisfied with their telemedicine layouts (Paul et al., 1999). System Reliability was the stability and reliability of telemedicine hardware and software. System Reliability like video quality and convenience was cited in previous literature as a barrier to adoption and utilization. Earlier renditions of telemedicine technologies certainly had reliability problems, but as technology advanced, the newer models implemented at the organizations where this study was conducted were judged to be stable (Paul et al., 1999).

The third category included System Design, Patient Privacy and Confidentiality. System Design was expected to be a barrier to usage under the assumption that systems would not be able to support virtual consultations (calls using video) with clinicians effectively. What ended up being the actual barrier for usage was how inaccessible systems were for users; the technology was overly sophisticated and difficult to use (Paul et al., 1999). System designers did not take into consideration the user-experience and thus the resulting systems were cumbersome and required significant training time, to which most physicians could not commit to (Paul et al.,

1999). Required by HIPAA, both privacy and security, while a topic of focus were not necessarily a barrier to the technology, however digital, records offered new avenues for consideration to keep patient health information secure (Paul et al., 1999). Digital health technologies were usually kept in non-clinical areas of the facilities, threats of records being read by non-clinical staff increased and considerations for where teleconsultations should be held, as well as developing a way to track record access, needed to be addressed (Paul et al., 1999).

Lastly, the unexpected barriers for telemedicine and specifically teleconsultations were poor audio quality. Many times, the audio quality was perceived as substandard and poor due to both the lack of proper acoustics in teleconsultation rooms and the location from where patients were calling (Paul et al., 1999). This was further exacerbated if there were more than three people in the room, or if the call took place in a large room. Physicians would experience headaches and would be unable to use the technology for extended periods of time. These are just a few of the barriers for telemedicine adoption and usage, financial, professional, and legal barriers exist as well, all culminating to the slow implementation of a tool with so much potential (Paul et al., 1999). These barriers slowed the adoption of telemedicine, but Covid19 provided a catalyst for change.

1.4.2 The Turning Point

Flash forward from the study conducted by Paul et al. in 1999 to 2021 and our current Covid19 crisis, there is a silver lining and a turning point for the adoption and use of telemedicine. An obscure service with limited traction in the early 20th century, is now becoming the preferred approach for delivery of healthcare. It is important to note that telemedicine infrastructures cannot be built overnight. Organizations that already had telemedicine capabilities

in place, however, but were underutilizing telemedicine, quickly demonstrated how powerful of a tool it can be for outpatient care. According to the Center for Disease Control (CDC) in the early stages of the pandemic, during the first quarter of 2020, telemedicine visits increased by 50% when compared to the same time in 2019 and further increased to 154% in the 13th week of 2020 compared to the same time in 2019 (Koonin et al., 2020). The increase in organizational usage is attributed to the changes in policy and public health guidance as a response to Covid19 which relaxed some of the legal hurdles of telemedicine utilization making it more accessible and financially viable. For example, some states passed waivers that suspended the requirement for in-person consultations to receive prescribed medications and allow physicians to provide teleconsultations across state borders. Patient usage was driven by the needs of people to receive medical care in a manner that maintained social distancing (Koonin et al., 2020). If the public health practices remain in effect throughout the pandemic and beyond, it could provide renewed energy for the scalability and widespread implementation for Telemedicine. Resulting in multiple public health benefits such as expanding access, reducing exposure to disease, preserving medical personal protective equipment (PPE), and reducing patient load on facilities (Koonin et al., 2020).

1.5 WHY IS INNOVATION IMPORTANT

The United States has a complex history regarding healthcare. Despite, comprising 18% of the US' GDP in 2019, nearly double the average percentage of the Organization for Economic Co-operation and Development member countries (OECD), the United States ranks the lowest in life expectancy and highest in suicide rates amongst its 11 contemporaries (Fox and Brod, 2019).

Additionally, the US lifts the highest chronic disease burden and an obesity rate double the OECD average, faces a physician shortage, and overutilization of expensive treatments (Fox and Brod, 2019). The US, however, does perform very well regarding preventative care, boasting one of the highest rates of breast cancer screenings amongst women ages 50 – 69 and second highest rate of flu vaccinations in people over the age of 65 (Fox and Brod, 2019).

In light of this, the United States is making attempts to address these issues of access, equitability, efficiency, etc and seeing incremental successes. These improvements were made through innovation of the healthcare sector. Innovation is defined in many ways "ranging from very broad and impressive generalizations to highly specific focusing on technical innovations" (Thakur et al., 2012). Some examples of innovative ideas in the United States are the shifts we are seeing from fee-for-service to value-based care. Rewarding providers and organizations based on the quality of treatment rather than the number of services patients receive. This aligns the incentives of physicians to understand more about the patient as an individual and not just their symptoms. Other innovations include, the adoption of digital health records, social determinants of health and population health, utilizing digital health technology, etc (Thakur et al., 2012). The combined result of all these initiatives is for the sole purpose of increasing access, adherence to and quality of care. With healthcare being a very fluid landscape as evident by the ongoing Covid19 pandemic, innovative solutions such as telemedicine will be crucial in addressing these gaps in care. To confront the ongoing challenges and into the future with the aging baby boomer generation and shortage of medical professionals, healthcare will have to continue to innovate if we are to maintain and improve the quality of care we expect.

2.0 TELEMEDICINE USE DURING A CRISIS

2.1 TELEMEDICINE REIMBURSEMENT

Prior to the Covid19 pandemic, the Centers for Medicare and Medicaid Services offered limited coverage for telemedicine services. Coverage was limited to certain services in certain sites, typically in rural areas. However, because of the pandemic, CMS has broadened telemedicine coverage on a temporary basis for the duration of the pandemic under the 1135 waiver and Coronavirus Preparedness and Response Supplemental Appropriations Acts (CMS, 2020). The goal was to give all Americans continual access to healthcare and ensure awareness of the services while containing the spread of the virus. Through the 1135 waiver starting on March 6th, 2020 Medicare was able to pay for office, hospital and other visits made via telemedicine across the country as well as in a patient's home (CMS, 2020). These changes were also extended to include common office visits, mental health counseling and preventative health screenings. Additionally, healthcare providers were offered flexibility to reduce or waive their side of cost sharing for telemedicine visits paid for by federal programs (CMS, 2020).

This expanded range of coverage was implemented to ensure that higher risk Covid19 beneficiaries were able to seek care without leaving their homes, which would put themselves and others at risk (CMS, 2020). Telemedicine visits were paid for at the same rate as in-person visits, which was a great financial incentive for health systems because they accrued savings on

space and high-cost resources. Another important decision by CMS regarding telemedicine expansion was waiving Health Insurance Portability and Accountability Act (HIPAA) violations for healthcare providers acting in good faith (CMS, 2020). This policy decision was made so providers would be more comfortable discussing potentially sensitive topics with patients on third-party platforms such as Facetime and Skype (CMS, 2020). Additionally, state governments relaxed licensure and certificate requirements to practice telemedicine across state lines, again increasing access to healthcare services wherever you may be in the United States (FSMB, 2020). Altogether these policy changes made it very easy for healthcare organizations with telemedicine capabilities to supplement their outpatient care while also saving on cost. It was a large reason why the transition to telemedicine happened so rapidly and almost seamlessly as demonstrated in the following case studies.

2.2 CASE STUDY 1

A study by Mann, Chen, and Chunara, et al. (2020) studied telemedicine use in New York Universities' Langone Health System (NYULH) based in New York City. The 4-hospital system with over 500 ambulatory care facilities, located in one of the United States' Covid19 epicenters was a prime location to research the impacts of Covid19 on telemedicine adoption. NYULH was connected through a single electronic health record, Epic, which was heavily integrated with Vidyo to enable NYULH's telemedicine services (Mann et al., 2020). By studying patient interactions at NYULH through data acquired from NYULH's EHR the following results were obtained.

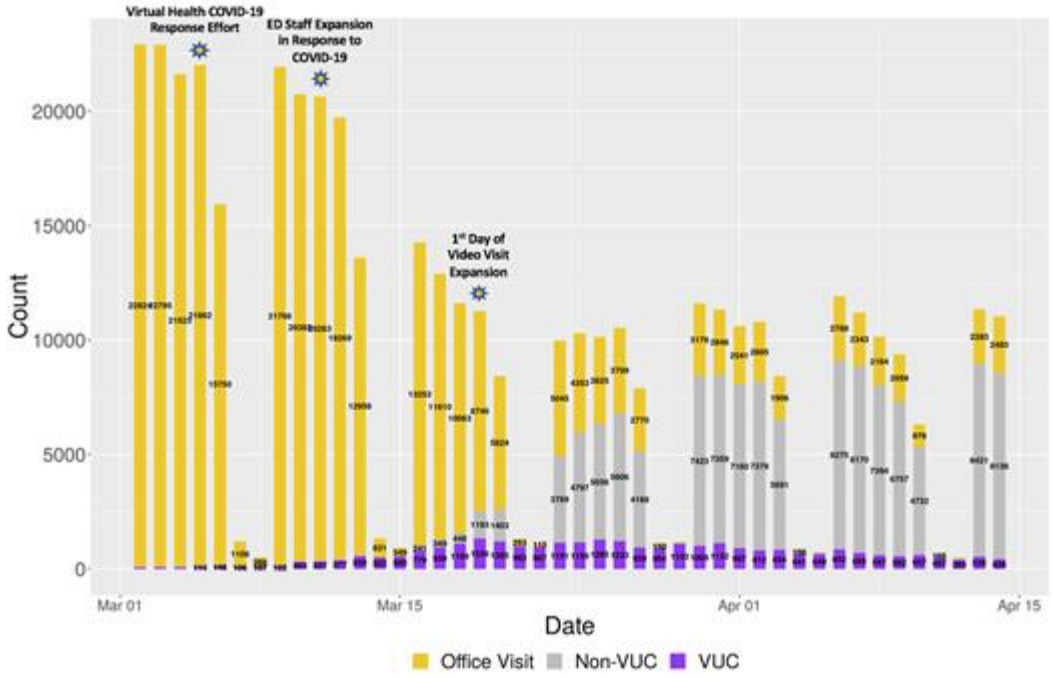

Figure 1: Visit Volumes in telemedicine urgent care (VUC) and nonurgent care (non-VUC) and decrease in in-person care. Each bar represents one day.

As seen in **Figure 1**, a massive decline in in-person visits took place from the period of Mar 1st -April 15th. There was a decline of over 80% for in-person visits, which was followed by a huge migration of patients to telemedicine visits. Beginning on March 19, over half of telemedicine visits were Covid19 related however soon after we would see an explosion in non-Covid19 related telemedicine visits (Mann et al., 2020). These influxes of non-urgent patients would be a result of large-scale video-based telemedicine adoptions from both patients and providers. The adoption of this technology by NYULH was so skillful that patient satisfaction rates did not change despite inexperienced providers learning to use the services for the first time as well. A patient satisfaction survey was queried from January 1st, 2020, which was before telemedicine services were fully operationalized at NYULH, to April 14th, 2020 (Mann et al., 2020). The surveys showed that patient satisfaction from telemedicine visits was the exact same

from when patients could come in person with a mean satisfaction score of 4.38/5 for both pre and post Covid19 (Mann et al., 2020).

Mann et al. conclude that Covid19 had an immensely transformational impact on telemedicine services and allowed the service to demonstrate its viability to provide quality medical care on a large scale. They believe that telemedicine may become a primary modality of health care delivery especially during any future disease outbreaks (Mann et al., 2020). The widespread use of telemedicine has conditioned both patients and providers to become comfortable uploading and using patient health information online, respectively. The additional convenience for patients that allows them to sync their health information with their phones, circumventing a waiting room and expediting postpartum hospital stays are creating a new standard of convenience and accessibility that will be hard to reverse post-pandemic (Mann et al., 2020).

2.3 CASE STUDY 2

In a second case study conducted by Chao, Li and Zhu, et al. (2021) and published in the Journal of the American Medical Association (JAMA) investigated the question "What were the telemedicine use patterns across surgical specialties before and during the Covid19 pandemic?" Telemedicine has been demonstrated as a viable option for outpatient care, however the service would also find its niche uses in surgical departments as well (Chao et al., 2021).

Chao et al. collected insurance claims data from a Michigan statewide commercial insurer for new patient visits, specifically for visits with a surgeon across 9 different specialties during the following periods: Pre-Covid19 (January 5th – March 7th, 2020), early Covid19

(March 8th – June 6th, 2020) and late Covid19 (June 7th – September 5th, 2020). The main results following the study were that out of the 4405 surgeons in the cohort, 26.8% (1182) surgeons used telehealth for new patient visits and 58.8% (2588) surgeons performed telemedicine visits for any patient context, such as pre and postoperative check-ins (Chao et al., 2021).

There was a total of 109,610 new patients registered during the pandemic, as compared to 173,939 new patients during the pre-Covid19 period. Out of those 173,939 less than 1% of new patient visits were conducted through telemedicine visits. In the span of 6 months, surgical department telemedicine visits for new patients had jumped from a negligible <1% to over 25%, growing across all specialties (Chao et al., 2021). However, as restrictions began to ease and proper guidelines for safe in-person examinations were developed the number of telemedicine visits began to decline but remain much higher than it was pre-Covid19 (Chao et al., 2021). This drop can most likely be attributed to the reasons why patients visit surgeons. Surgical patients require a physical examination to determine their fitness for treatment and many doctors may not have been adequately trained to perform those examinations virtually. This is cited as a large barrier for adoption in surgical centers post-pandemic. Overall, in a surgical context, telemedicine has its niche uses however further research must be done to determine what role it will play in a post-Covid19 world (Chao et al., 2021).

2.4 FUTURE OF TELEMEDICINE

There is a lot of debate when it comes to the future of telemedicine. Will it become the new standard for outpatient healthcare delivery, or will it have served its use during a crisis? There are merits to both sides of this argument. Throughout the pandemic the United States

federal government offered broad definition reimbursements for health organizations that utilized telemedicine in their health services. These influxes of cash combined with savings health systems incurred from reductions in space utilization and high-cost resources were huge incentives to migrate to telemedicine services. However, some organizations and healthcare stakeholders worry how long these financial incentives will last, and once they disappear, will telemedicine disappear along with it (AMA, 2021)?

On the other side of the camp, supporters of telemedicine have faith that with or without these financial incentives the landscape of healthcare has changed so much in the past year of the pandemic that there is no going back to the status quo. The patient's role in healthcare has steadily been changing over time. With increasing access to technology, patients can shop around for services and are transitioning into a more consumer role. As a result, healthcare organizations are discovering the need to have brand defining services to capture the interests of consumers. As a result of the pandemic the already evident paradigm shift of consumers to e-commerce has only accelerated.

A survey conducted by UNCTAD and Netcomm Suisse eCommerce Association (2020) identified that most major product categories were seeing a 6-10% increase in online sales. More than half the survey participants had stated that they were shopping online more frequently and used the internet as a main source of news and entertainment (UNCTAD, 2020). Online giants such as Netflix and Amazon saw surges in their stock prices during the quarantine, showcasing that consumers overall are adapting themselves to an online lifestyle. Should this trend of working from home, shopping, and entertaining ourselves online continue post-pandemic, it will be hard to imagine healthcare being the only sector to return to the status quo.

2.5 CONCLUSION

Covid-19 was a true test for both the United States and world to adapt to a public health emergency that comes around maybe once in a decade. In a time of crisis, the US healthcare sector despite the challenges was able to come together and innovate solutions. Telemedicine was one such innovation that health organizations quickly adopted, so that patients could maintain access to health services while also maintaining safety for themselves, their families and those around them. CMS played a large role by expanding coverage for their beneficiaries and relaxing regulations on healthcare providers to make the transition to telemedicine as easy as possible. As a result, research is showing the promises telemedicine has in revolutionizing patient care both during a crisis, for recovery, and beyond.

Healthcare organizations are demonstrating telemedicine's scalability and potential for improving outpatient interactions. At the end of the day the question remains of what telemedicine's legacy will be once the danger of Covid19 passes? The consumer trends in both healthcare and everyday life are clearly moving towards a digital age, only accelerated by the pandemic through lockdowns and social distancing. Healthcare despite its historical challenges with HIT adoption is constantly making the effort to move in that direction as well, which bodes well for telemedicine's future. However, whether its continued use with or without the support of CMS' expanded coverage and state licensing relaxations remains to be seen, stressing the importance for future research on this topic.

BIBLIOGRAPHY:

Ballotpedia. (2021). *Federal government responses to the coronavirus (COVID-19) pandemic, 2020-2021*. Ballotpedia. https://ballotpedia.org/Federal_government_responses_to_the_coronavirus_(COVID-19)_pandemic,_2020-2021

Buntin, M. B., Burke, M. F., Hoaglin, M. C., & Blumenthal, D. (2011). The benefits of health information technology: A review of the recent literature shows predominantly positive results. *Health Affairs, 30*(3), 464–471. https://doi.org/10.1377/hlthaff.2011.0178

California for All. (2021). *No Title*. CaliFORnia All. https://covid19.ca.gov/

Center for Disease Control and Prevention. (2021). *Interim U.S. Guidance for Risk Assessment and Work Restrictions for Healthcare Personnel with Potential Exposure to SARS-CoV-2*. CDC. https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assesment-hcp.html

Center for Medicare and Medicaid Services. (2020). *Medicare Telemedicine Health Care Provider Fact Sheet*. CMS. https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet

Chao, G. F., Li, K. Y., Zhu, Z., McCullough, J., Thompson, M., Claflin, J., Fliegner, M., Steppe, E., Ryan, A., & Ellimoottil, C. (2021). Use of Telehealth by Surgical Specialties During the COVID-19 Pandemic. *JAMA Surgery*. https://doi.org/10.1001/jamasurg.2021.0979

Fox, B., & Brod, M. (2019). *New International Report*. 1–3.

FSMB. (2020). U . S . States and Territories Modifying Requirements for Telehealth in Response to COVID-19 (Out-of-state physicians ; preexisting provider-patient relationships ; audio-only requirements ; etc .) Last Updated : October 21 , 2020 States with Waivers : 4. *Federation of State Medical Boards*, *19*. https://www.fsmb.org/siteassets/advocacy/pdf/states-waiving-licensure-requirements-for-telehealth-in-response-to-covid-19.pdf

Gebreyes, K., Davis, A., Davis, S., Shukla, M., & Rush, B. (2021). *Breaking the Cost Curve*. Deloitte. https://www2.deloitte.com/xe/en/insights/industry/health-care/future-health-care-spending.html

Health IT. (2021). *Health IT Legislation*. Health IT. https://www.healthit.gov/topic/laws-regulation-and-policy/health-it-legislation

Koonin, L. M., Hoots, B., Tsang, C. A., Leroy, Z., Farris, K., Jolly, B., Antall, P., McCabe, B., Zelis, C. B. R., Tong, I., & Harris, A. M. (2020). Trends in the Use of Telehealth During the Emergence of the COVID-19 Pandemic — United States, January–March 2020. *MMWR. Morbidity and Mortality Weekly Report*, *69*(43), 1595–1599. https://doi.org/10.15585/mmwr.mm6943a3

Mann, D. M., Chen, J., Chunara, R., Testa, P. A., & Nov, O. (2020). COVID-19 transforms health care through telemedicine: Evidence from the field. *Journal of the American Medical Informatics Association*, *27*(7), 1132–1135. https://doi.org/10.1093/jamia/ocaa072

Office for Civil Rights. (2020). *Health Information Technology*. HHS. https://www.hhs.gov/hipaa/for-professionals/special-topics/health-information-technology/index.html

Paul, D. L., Pearlson, K. E., & McDaniel, R. R. (1999). Assessing technological barriers to telemedicine: Technology-management implications. *IEEE Transactions on Engineering Management*, *46*(3), 279–288. https://doi.org/10.1109/17.775280

Robeznieks, A. (2021). *Q&A Telehealth here to stay, but doctor's key requirements remain*. American Medical Association. https://www.ama-assn.org/practice-management/digital/qa-telehealth-here-stay-doctors-key-requirements-remain

Singh, H., & Sittig, D. F. (2016). Measuring and improving patient safety through health information technology: The health IT safety framework. *BMJ Quality and Safety*, *25*(4), 226–232. https://doi.org/10.1136/bmjqs-2015-004486

Singhal, T. (2021). A Review on COVID-19. *Studies in Computational Intelligence*, *924*(April), 25–42. https://doi.org/10.1007/978-3-030-60188-1_2

Thakur, R., Hsu, S. H. Y., & Fontenot, G. (2012). Innovation in healthcare: Issues and future trends. *Journal of Business Research*, *65*(4), 562–569. https://doi.org/10.1016/j.jbusres.2011.02.022

UNCTAD. (2020). *Covid-19 has changed online shopping forever, survey shows*. United Nations Conference on Trade and Development. https://unctad.org/news/covid-19-has-changed-online-shopping-forever-survey-shows

WHO. (2021). *WHO Coronavirus (COVID-19) Dashboard*. World Health Organization. https://covid19.who.int/

Wooton, R., Craig, J., & Patterson, V. (2017). *Introduction to Telemedicine* (second). CRC Press.

Zwanka, R. J., & Buff, C. (2021). COVID-19 Generation: A Conceptual Framework of the Consumer Behavioral Shifts to Be Caused by the COVID-19 Pandemic. *Journal of International Consumer Marketing*, *33*(1), 58–67. https://doi.org/10.1080/08961530.2020.1771646