# Telehealth in Primary Care and Nursing

## Efficacy, Implementation, and Market Opportunities

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No time like the present has cemented the presence and necessity of remote health delivery in our healthcare system. In the face of a pandemic, the inherent dangers of face-to-face visits force us to reevaluate how we can best deliver care. Economic data, case studies, and industry interviews culminate in a strong case for the use of remote care to save costs and improve outcomes. This paper seeks first to collect, evaluate, and analyze this evidence. Second, it aims to study the state of the commercial market for Telehealth services, identifying major providers, payers, demonstrated need, and novel opportunities.

What was months ago a scant afterthought of our medical system may now be its shining path forward. As the Coronavirus crisis wreaks havoc on lives, care delivery systems, and the global economy, in mere weeks Telehealth has become an integral tool of care delivery throughout the United States and much of the world.[1] But more than a tool of necessity, it has become one of choice. Doctors have attested that a video chat, call, or text message can be quicker, more intimate, and lead to better patient outcomes.[2]

The pivot to telehealth was swift. Providers scrambled to adopt digital systems to provide remote care.[3] But in a matter of weeks, public and private systems alike adapted to a stark rise in volume. Medicare expanded coverage to pay for not only remote check-ins but fully digital appointments for those in rural areas.[4] And broad demand for in-person medical care has increased, with forecasts expecting upwards of 200 million care visits this year, up from last year's 36 million.[5] Telehealth visits in the month of March surged 50%, for a predicted 1 billion remote visits by year's end.[6]

As COVID-19 continues to overwhelm hospitals and doctor's offices, it renders clear the case for a robust telehealth system. And we should hope that this system is built to last beyond this pandemic. Beyond improvements in care remote health can provide a strong reduction in cost—something valuable to a healthcare

[1] Nguyen, "Will Telemedicine Be the New Norm after the Coronavirus Crisis?"
[2] Nguyen.
[3] Jeffries, Telehealth in Insurance.
[4] "Medicare & Coronavirus."
[5] Coombs, "Telehealth Visits."
[6] Coombs.

system that already spends more per capita than any country in the world. Once providers, insurers, employers, and consumers experience the benefits of remote care brought about in this crisis, they may want to keep it around.

# 1 A Brief History of Remote Care

A deep understanding of the field of remote health, its history, and its implementation are crucial in evaluating the efficacy and market status of current offerings. This section will explore the historical precedent of remote care and the forces that drove its development over the past century.

## *1.1 Science Fiction Dreams, NASA, and Early Efforts through the 1980's*

Visions of remote, real-time medical care began, like most the modern technology we take for granted, in early 20th century science fiction. With the advent of radio, authors and inventors in the 1920s envisioned a "radio doctor" machine which could transmit video and sound long distances.[7] Nearly 100 years later, we're living the science fiction of the past.

The initial vision of a remote video link with a doctor predated the first television transmission, in 1927, by over two years.[8] In the following decades, Telemedicine became an intense, impressively fruitful, though ultimately unsuccessful field of academic research.

Most early technology relied on using and abusing the vast telephone communications infrastructure abundant within the United States. The first recorded application was radiology—a field where a remote consultation of an X-Ray image has long been feasible. A handful of hospitals in the 1950s established a system of sending images via telephone over the 24 miles between West Chester and Philadelphia.[9]

The University of Nebraska even pioneered video technology in the 1960s by developing a two-way video communication system for communicating across the medical school's campus. Soon they even expanded the video link to span the 112 miles to the Norfolk State Hospital to "provide speech therapy, neurological examinations, diagnosis of difficult psychiatric cases, case consultations, research seminars, and education and training."[10] The technology was clearly ahead of its time, but expensive and cumbersome enough that it never spread far beyond its limited academic roots.

Later in the 1960s more practical urban uses of remote care were developed. Massachusetts General Hospital (MGH) was among the first to provide remote nursing care and which in many ways foreshadowed the high-tech remote

[7] Fenston, "Telemedicine: Adventures in Time and Space."
[8] Staff et al., *Telemedicine*, 35.
[9] Staff et al., 36.
[10] Staff et al., 36.

monitoring indicative of modern Telehealth. In 1963, MGH established not only a telephone link with Boston Logan Airport and the local Bedford Veterans Administration, but used long-range microwave signals to transmit stethoscope, electrocardiograph, and other vital signals to the remote nursing clinics.[11]

The late 1960s saw the most ambitious attempt at Telehealth yet. Lockheed, NASA, and The U.S. Indian Health Service joined forces to use satellites to bring care to both astronauts and remote Native American tribes in a space-age program dubbed STARPAHC (Space Technology Applied to Rural Papago Advanced Health Care).[12] The program saw some success, but was ultimately phased out by 1980.

## *1.2 Managed Care, Neoliberalism, and the Internet*

Most Telemedicine programs, in fact, didn't make it far beyond the 1980s. Only one such program established before 1986 even survived into the 1990s. [13] Grants and government funding for research had all but dried up, but a whirlwind change of health policy and political winds boosted Telehealth to a shaky public debut.[14]

If a single change pushed Telemedicine back to the top of the docket, it was the adoption of managed care as an aggressive tool for cost control nationwide. In a system where most healthcare was paid for on a fee-for-service (FFS) basis, managed care promised to cut costs while forcing provider accountability and efficiency.[15, 16] The results of this were twofold. First, providers facing lower reimbursement rates brought on by managed care sought to centralize their resources and reduce per-visit costs via Telemedicine programs. Second, some providers and medical centers found their revenues plummeting and themselves possibly excluded from newly narrow insurance networks, pushing them into Telemedicine as a means to "develop new regional, national, and international markets for highly specialized clinicians."[17]

A second and less tangible shift in this era was the unprecedented growth in venture capital and neoliberal economic policies paving the way for Telemedicine to emerge as a business opportunity rather than an academic interest. Between a booming economy and the growth of the Internet, venture capital in 1990s America shifted from obscure and closely held into an exponential expansion and diversification of investment.[18] One study described the shift as from a "niche play," where venture capital firms were few and their portfolios closely held, to a "lottery play" in which wild speculation led to a

[11] Staff et al., 38.
[12] Staff et al., 39.
[13] Staff et al., 39.
[14] Coren, "Telehealth Changing Care from Outer Space to Local Clinics."
[15] Enthoven, "Managed Care."
[16] Alain Enthoven once told me I would never get into Stanford. He was correct.
[17] Staff et al., *Telemedicine*, 3.
[18] Boquist and Dawson, "U.S. Venture Capital in Europe in the 1980s and the 1990s," 40.

massive influx of cash into startups and novel technologies.[19] This became more evident as a driving force in retrospect, but even a 1996 National Research Council report on Telemedicine identified the growth of profit-driven "investor-owned enterprises" as a major force in the healthcare space.[20]

This shift from academic to commercial opened the door to a wide array of innovation and novel trials. The Allina health system in Minnesota was among the first to fully integrate a Telemedicine option for its patients, both offering and paying for the services at the same rate as regular consultations. [21] Allina would then contract with rural providers to offer Telemedicine services promising tens of thousands of dollars in annual savings.[22]

Some providers began directly offering Telemedicine as a trial of efficacy. In 1993, a group of private primary care practices in Denver coordinated to establish a unified after-hours nursing phone line for their patients. [23] The program initially sought to reduce strain on providers and increase their capacity, but its secondary effects were promising. One hundred percent of physicians were satisfied with the system, alongside over 95% of parents who used it after-hours.[24] Physician satisfaction was especially impressive given that they paid for the program out-of-pocket.[25]

Patients and providers both tended to like these newly developed systems once implemented, but serious barriers remained. First and foremost, the technology to make them successful was limited and expensive. Phone lines were simple but limited. The more advanced internet-based systems that dominate the conversation today, however, saw scarce success due to high costs of infrastructure and the nascent technology available.[26] This high cost and uncertain benefit prevented widescale adoption by many providers. A majority of managed care organizations and payers surveyed in the early 1990s still considered Telemedicine a fringe program and invested little in it directly.[27] From their perspective, Telemedicine was unproven and far from the most effective means of cost control. Physicians, finally, were among the most skeptical. Faced with declining payment already, they feared that Telemedicine would shift care away from their practices or forcibly lower their prices.[28]

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[19] Boquist and Dawson, 41.
[20] Staff et al., *Telemedicine*, 4.
[21] Staff et al., 52.
[22] Staff et al., 53.
[23] Poole, "Telephone Triage and Advice System for Pediatric Practices," 670.
[24] Poole, 670.
[25] Poole, 670.
[26] Staff et al., *Telemedicine*, 4.
[27] Staff et al., 52.
[28] Staff et al., 3.

Telehealth had received its second wind, but between unproven efficacy and expensive, limited technology, it failed to reach the commercial success many predicted for it before the end of the 20th century.

### *1.3 21st Century Tech Bridges the Gap*

What held-back the vision of Telehealth during the 1990s set it free come the 2000s. Not long after the dot-com boom and bust, the Internet had reached mass adoption, consumer technology was leagues faster and more accessible, and high-bandwidth broadband and communications infrastructure existed in much of the country.

It wasn't until 2002 that the "telehealth" most of us imagine today existed. Among the earliest movers was the Veterans Administration (VA). In an effort to expand care they launched a comprehensive telemedicine program for primary care which now boasts over 2 million patients.[29]

The first successful commercial entrant into the space was a small Dallas startup launched in 2002 under the name Teladoc. Founded by a former NASA flight surgeon with experience in Telemedicine research at the University of Texas, the company was the first to offer employers a subscription to an on-demand video or phone consultation for their employees.[30] The concept was a resounding success. By 2005 it became the first Telehealth company to launch nationally. By 2007 it acquired over 1 million customers. And it inspired a hoard of competitors. These ranged from American Well which sold to hospitals, to MDLIVE which targeted employers and consumers.[31]

The early systems these companies offered were rudimentary and limited. State licensure issues typically required any consultation be with a doctor licensed in that same state. Power to prescribe was limited as well, a result of reactive laws instituted in the 1990s to avoid drug abuse.[32] But the concept caught on both as an employee benefit and a means of cost control.

### *1.4 New Technology, New Challenges*

The 2010s ushered in a massive growth in Telehealth but brought their own challenges as well. A wealth of new technologies, connected devices, and fast internet connections have made a new generation of digital healthcare possible. But regulatory hurdles and consumer apathy continue to challenge the industry. The novel development of the Coronavirus pandemic will likely propel consumer Telehealth to further adoption, but the ultimate scope and extent of that change is unclear.

One of the areas which has grown to adopt Telehealth in the past decade is employer-based insurance, typically as a means of cost

[29] Goodman, "How the North Texas Telemedicine Revolution Began."
[30] Goodman.
[31] Goodman.
[32] Goodman.

control and triage.[33] And the features of modern Telehealth services are what enable these savings. Leading services like Teledoc and the nascent Amazon Care (currently in private beta for employees) have expanded coverage from triage and consultations to comprehensive primary care. These services offer video consultations with Primary Care Physicians (PCPs) and often the ability for those doctors to remotely write and deliver prescriptions.[34] Increasingly, Telehealth services are becoming standard among existing healthcare providers as well. A Teladoc survey in 2020 found that 64% of health services and providers already had some degree of remote health implemented, with 24% planning to expand those offerings.[35] Though the bias of that survey is questionable, it depicts the increasing trend and adoption of remote health services by traditional providers and plans.

The VA has seen massive growth in its Telehealth program as well and continues to be a pioneer in the space. Ira Wilson, the Chair of Health Services, Policy, and Practice, and a primary care physician at the Rhode Island VA described telehealth as having long been central to the VA and its ability to see patients efficiently and in any location. Full-time VA physicians are now expected to meet a certain quota of Telehealth visits per week—a strategy which has increased appointment attendance and accessibility on a tight institutional budget.

Regulatory hurdles, especially around licensure remain ever-present in the field. Licensure, especially, hinders progress. Despite some legislation and attempts to improve cross-state licensing, most states continue to require in-state licenses for Telehealth visits.[36] In 2015, Texas went even further and passed a law requiring any Telehealth visit to be preceded by an in-person visit for the physician to be able to diagnose or prescribe drugs for any medical issue.[37] Teladoc sued, but the rule remains in litigation.

As technology, data science, and internet speeds advance, the capabilities of remote health expand dramatically. In a few decades, it grew from a niche product to the keystone of many health delivery plans today. Though despite that, utilization and awareness tend to be low, leading to low consumer perception of its availability and benefits.[38] The field is poised for massive growth as existing trends push more consumers to Telehealth as a cheaper alternative to traditional care. This resonates especially as the COVID-19 crisis forces familiarity with the technology.[39]

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[33] Jeffries, Telehealth in Insurance.
[34] "Amazon Care."
[35] "3rd Annual State of Consumer Telehealth Benchmark Survey Results," 2.
[36] Goodman, "How the North Texas Telemedicine Revolution Began."
[37] Goodman.
[38] Jeffries, Telehealth in Insurance.
[39] Dorsey and Topol, "State of Telehealth," 154.

# 2 Remote Care Today

## *2.1 Changing Motivations for Use and Research*

Remote care, historically, was a tool for expanding access.[40] It brought primary care to people in rural areas, and specialty care to urban clinical settings. It was even used for military and prison applications, where in-person medical care can be prohibitively expensive or even impossible. [41] These applications all focused on expanding access to care above all. Metrics of cost and quality were secondary concerns, if considered at all. The bulk of existing research until the 2010s on Telehealth mirrors this motivation. It focuses on hyper-specific applications of telehealth to increase access to a type of care, such as diabetes monitoring or appendicitis triage.[42]

But the previous 20 years, and the past five to ten especially, have entirely redefined the basic motivation for Telehealth. Now, it is a tool for reining in the wildly inflating costs of the American healthcare system. This is evident in the types of research emerging which increasingly focus on the effects of Telehealth on costs rather than specific interventions and outcomes.[43] Changes in policy reflect this shift as well. The US Senate Committee on Finance itself stated in a report that "interest is growing to see if telehealth has the potential to reduce health care costs." [44] And slowly the legal framework supporting Telemedicine moves to support this shift. H.R. 3081, or the TELE-MED Act of 2015, introduced by none other than the illustrious Devin Nunes, proposed expanding Medicare provider's abilities to see cross-state Telemedicine patients.[45]

From the perspective of the healthcare system today, remote care controls costs. It reduces or substitutes utilization of traditional services while improving long-term outcomes.

The patient motivation for using Telehealth is slower to adapt, however. Patients still view remote care as a tool for access.[46] Some view it as access via convenience, and others due to lack of alternative sources of primary care.[47] But as consumers independently buy low-deductible or non-group insurance plans they have become far more likely to independently purchase a Telehealth offering as a means of cost reduction.[48]

For now, effective Telehealth implementations serve two goals. They must reduce costs for the payer and increase access or convenience for

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[40] Dorsey and Topol, 154.
[41] Dorsey and Topol, 154.
[42] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care," 350.
[43] Bashshur et al., 349.
[44] Dorsey and Topol, "State of Telehealth," 149.
[45] Nunes, TELE-MED Act of 2015.
[46] Dorsey and Topol, "State of Telehealth."
[47] Liaw et al., "Disconnected," 420.
[48] Dorsey and Topol, "State of Telehealth," 156.

the patient. Patient motivations will likely shift toward cost over time, but any effective system must maintain a high-quality user experience.

## 2.2 *The Modern Taxonomy of Telehealth*

Telehealth as it exists today can describe a vast range of services modes of delivery. There are various types of remote care, each with particular benefits and goals.

### *2.2.1 Store and Forward*

Among the earliest forms of "remote medicine" adopted, Store and Forward care is asynchronously acquiring medical data, such as imaging, forwarding it to a physician or specialist remotely, and awaiting a response at a later time. This was first adopted for radiology in the 1950s and 1960s and remains a central feature of radiology care today. [49] Accordingly, most of this care takes place while already in a medical setting (i.e. your X-Ray is sent to a radiologist while you are at the doctor's office). This mode of care is so common in health care and in-person visits today that most would hardly consider it remote care, but it is a key part of our system. That said, it is seldom patient initiated, nor does it play a large role in care at home.

### *2.2.2 Remote Monitoring*

One of the quickest growing fields of consumer-facing telehealth, mirroring the rise of wearable or smart health devices, is the ability for physicians to monitor a stream of biometric or health-related data, such as weight or heart rhythms. Increasingly, companies and providers are integrating with these smart technologies to offer preventative care around chronic conditions and gain a broad and objective view of patient health (as opposed to the subjective nature of a patient's description of their own symptoms).[50] This has historically been physician initiated and directed within the scope of specific chronic conditions, such as diabetes.[51] But innovation is occurring rapidly in this space. Apple recently partnered with Stanford to launch a massive heart study meant to detect Atrial Fibrillation by leveraging the millions of users of the Apple Watch.[52] Though limited in scope now, this type of telehealth will likely play a key role in both preventative care and automatic observation of existing conditions.

### *2.2.3 Real-Time Interactive Care*

This is the most commonly understood type of remote care involving a patient communicating in real-time with a provider. From text, to phone, to video-chat, this is the mode of care that has become necessary and prevalent during the COVID-19 crisis. This is patient-initiated care which can take multiple forms. Some providers, like Teladoc, connect patients to a random physician, after they have filled out an intake form. Increasingly in 2020, however,

[49] Staff et al., *Telemedicine*, 32.
[50] Jeffries, Telehealth in Insurance.
[51] Dorsey and Topol, "State of Telehealth," 155.
[52] "Apple Heart Study."

primary care practices are setting up in-house Telehealth programs exclusively for their existing patients.[53] The second approach has been historically less common as it pulls physicians away from profitable in-person visits which often yield pricey tests and diagnostics.[54] Discussions of telehealth in this paper will focus mostly on this mode of remote care, its applications to primary care and nursing, and its efficacy and market opportunities.

### *2.3 Current Applications of Telehealth*

Overwhelmingly the most common use of telehealth, based on a survey of literature, in-person interviews, and public data on health plans, is in nursing advice, triage, and preventative care. Not only was this among the early applications of remote health, but it is relatively cheap and simple to implement. Moreover, a variety of health plans and/or employers provide these services, including Brown University, Providence Health Plan, and many BCBS plans. These services tend to be seen as a low-cost means of triage and reducing unnecessary care. But they also suffer low usage. Many patients are either confused, unaware, or simply apathetic to the telehealth offerings they have available due to poor communication or user experience.[55]

Often, these nursing-adjacent services aim to provider after-hours service. Many are either 24/7 or explicitly operate outside of the regular hours of a certain provider.[56] As remote health becomes more prevalent, these services are increasingly operating during the day as an alternative to regular care or ER visits.

Growing in popularity is telemedicine in for primary care. Though the ability for primary care providers to provide remote visits has existed in some capacity for years, it has only recently come into sharp focus. According to Josh Jeffries, a health insurance broker in the DC area, prior to the COVID-19 crisis, remote health in primary care siloed, or provided by specialized telehealth providers like Teladoc. However, in an effort to maintain revenue during COVID-19, primary care offices are scrambling to either purchase a remote health solution or build one in-house—a fraught and expensive process in the current climate.

Though still in flux, a shift from disconnected remote consultations to those provided by one's typical PCP could lead to better continuity of care, consumer satisfaction, and health outcomes. This is especially true as a robust remote care offering by a primary care provider allows for quick, efficient, and meaningful check-ins and follow-ups to any individual visit.

A note on many of these primary care methods of telehealth is that, if not provided by the regular PCP or insurance plan, as is often the

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[53] Coren, "Telehealth Changing Care from Outer Space to Local Clinics."
[54] Jeffries, Telehealth in Insurance.
[55] Colucci et al., "A 'Matter of Communication,'" 448.
[56] Hanne, M, and W, "Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use."

case, many of these systems do not connect to the patient's electronic medical records. This forces patients to re-enter their medical information the first time they use the service and can lead to a decrease in continuity of care.[57]

## *2.4 Current Modes of Delivery*

Separate from how telehealth is used, an important implementation detail is how it is delivered to the consumer. Traditional techniques are phone hotlines and online patient portals for asynchronous communication. But increasingly, novel methods of delivery are being implemented by providers and companies alike.

Evidence tends to show a correlation between the type of remote health and the mode of delivery. Nursing and triage services most often rely on phone-based systems. These are systems which in some cases, such as Denver, originated in the 1990s.[58] Even current systems, however, are built around phones, both in the United States and abroad.[59] Benefits of this mode of delivery is that it is cost effective and relatively light on novel infrastructure. Call centers have existed for decades and are simple to setup relative to modern cloud technology.

Notably, the most accessible forms of telehealth currently rely on phone-based delivery, often as an add-on feature of a health plan. This is the case for many Blue Cross Blue Shield plans, which offer a "24-hour nurse line."[60]

Increasingly, telehealth is being conducted via mobile apps. This is where the realm of remote care severs from the insurers and is taken over by third party companies. According to Jeffries, more and more companies are explicitly purchasing telehealth products in addition to their plans—typically from large providers like Teladoc. This provides patients with a rich mobile interface which allows scheduling and video chat. Amazon Care is also among the apps that operate in this fashion, providing quick access to either chat of video calls.[61] This is much more technically complex to operate, hence why standalone telemedicine providers tend to operate these services.

Given proper communication and knowledge, patients and consumers prefer this latter mode of delivery. One 2017 study found that all participants enjoyed video-based health appointments and hoped to continue using it as an alternative to in-person visits.[62] This study didn't even factor in remote health services with the abilities to write prescriptions, such as Amazon Care and Teladoc. Anecdotally, employees who learn of the ability to call the doctor, assess their issues, and get a

[57] Jeffries, Telehealth in Insurance.
[58] Poole, "Telephone Triage and Advice System for Pediatric Practices."
[59] Hanne, M, and W, "Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use," 133.
[60] "24 Hour Nurse Line."
[61] "Amazon Care."
[62] Powell et al., "Patient Perceptions of Telehealth Primary Care Video Visits," 228.

prescription shipped to them in a matter of minutes as opposed to scheduling a doctor's appointment are quickly hooked and become loyal customers of the service.[63]

## *2.5 Questions of Liability*

As in any medical situation, liability is a fraught and potentially expensive issue. Telehealth providers have to be especially careful about the advice they provide for a litany of reasons if they hope to avoid malpractice suits.

When it comes to malpractice, however, providers must be careful. Many traditional providers such as clinics and hospitals have placed strict rules around who can give medical advice over the phone and the procedures for doing so.[64] Whereas in person visits give the physician or nurse many ways to assess a patient, phone calls or even video chat are very limited. Only what the patient says directly, or what can be shown on video at a distance, can be used for assessment. In most cases, care over the phone is just as liable for malpractice as in-person are, despite the lack of context or information.[65] Fortunately, as will be discussed later, rates of error and malpractice are nearly zero in Telehealth systems due to strong protocols and a tendency to recommend higher levels of care.

## *2.6 Licensure as a Barrier*

Since the 1990s, questions of licensure have dominated discussions of Telehealth.[66] Since states are the historic source of medical licenses, most have strict rules about physicians practicing out-of-state. This translates directly to Telehealth as well, where cross-state licensure is a sought-after but scarcely exists.[67]

Solutions to this problem have been limited thus far. Most health plans operate within the bounds of one state, thus source local providers for any phone lines they may provide.[68] Corporate telehealth solutions, like Teladoc, have been forced to establish a provider network in each state they operate in, however.[69] This current structure, though it was never designed to, incentivizes local or provider-based Telehealth systems. The barrier to entry to create a nationwide Telehealth provider on-par with something like Teladoc is, at this point, miles high, and likely impossible without significant venture capital funding.

But there is a light at the end of the tunnel. As Telemedicine has risen to prominence in the past five years, licensure laws have begun to shift. Increasingly, nurses can obtain multi-state licenses for the purpose of Telehealth, though under most of these programs they are held

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[63] Jeffries, Telehealth in Insurance.
[64] Austin, "Are You Liable for Telephone Advice?," 54.
[65] Austin, 68.
[66] Staff et al., *Telemedicine*, 89.
[67] Mataxen, "Licensure Barriers to Telehealth Nursing Practice."
[68] "24 Hour Nurse Line."
[69] Goodman, "How the North Texas Telemedicine Revolution Began."

liable to the regulations of the patient's state.[70] But physician licensing is much more difficult. In 2014 an Interstate Medical Licensing Compact was put forth by the Federation of State Medical Boards, but progress has been minimal at best.[71]

As of November 2019, 49 states require that physicians practice Telemedicine in the same state as the patient. But states are increasingly creating special-use licenses to practice Telemedicine with out-of-state licenses. 12 states currently allow this type of practice.[72] Among the most recent of these is Florida, which last year created a program to allow out-of-state physicians to provide Telehealth care to in-state patients.[73]

The Coronavirus crisis, having decimated the availability of medical staff and forced Telehealth visits in a majority of cases, has pushed many states, such as New York, Washington, Colorado, and Massachusetts to waive their in-state licensure laws for *all* healthcare providers, which includes Telehealth.[74] It remains unclear what of these changes will remain after the virus subsides, but many hope that if Telehealth becomes popular among consumers governors may feel pressure to keep their lax licensure laws.

## *2.7 Who pays and how?*

### *2.7.1 Costs to Purchasers*

Three cost models are broadly present in telehealth. In the case of simple services, like phone lines provided by insurers, the service is typically fee to use. This makes sense, as the service exists only to reduce the utilization of higher-cost services. But as more and more telehealth services are provided by third-party commercial services, this model is diminishing in use.

Commercial telehealth plans tend to offer two pricing plans to employers, as described by Jeffries in his experience as an insurance broker. First, they offer to charge a small rate per employee per month (maybe $1 or $2) for basic access to the system, and then levy a $30 to $50 copay for each instance of care.[75] This has the benefit of reducing risk for the purchaser (the employer, in most cases), but passes on a higher cost to the employees and may decrease utilization. The second model is to charge a higher flat rate per employee per month for unlimited access. This is usually between $3 and $10. And often, in this second case, employers simply add that same small amount to the employee's monthly contribution to their health plan.[76] This means that to employers purchasing telehealth, the

[70] Mataxen, "Licensure Barriers to Telehealth Nursing Practice," 67.
[71] Dorsey and Topol, "State of Telehealth," 157.
[72] "Telemedicine Policies Board by Board Overview."
[73] Nuzzo and Nastasi, "Florida's Pioneering Medical Reforms."
[74] The Wall Street Journal Editorial Board, "Doctors Without State Borders."
[75] Jeffries, Telehealth in Insurance.
[76] Jeffries.

cost to them is $0 from the outset, and then they save money every time an employee uses the service instead of a traditional PCP or ER visit. Moreover, employees hardly notice the increased fee, and are incredibly happy about the free health service they get (if it is correctly communicated).

### *2.7.2 Reimbursement of Providers*

Current modes of delivery tend to rely on one of three methods for sourcing and reimbursing their providers. First, Telehealth companies can contract with provider networks to get a certain quota of visits of hours from those providers.[77] Second, providers sometimes setup their own private Telehealth systems for their existing patients and are paid either on a fee-for-service basis or by the patient's insurer's reimbursement model.[78] Third, and least often, Telehealth companies create a dynamic marketplace for what are essentially "freelance" providers paying them a per-visit rate, entirely separate from provider networks and health plans.[79] These are the two most straightforward models, certainly, but more novel, cost efficient, and scalable models may exist.

Dynamic two-sided marketplaces have already taken hold in much of the economy but lag behind in their adoption in medicine. However, some companies have attempted to create these models. One example is SurgiPrice, which is a dynamic marketplace for surgeons and hospitals to compete to fill schedules and/or rooms at the lowest rates.[80] Teladoc has also implemented some degree of a dynamic marketplace. They have a fixed cost-per-visit that physicians in their system are paid and allow physicians to take as many visits as they choose in a day.[81] A cottage industry has even sprung up of physicians teaching other physicians how to make money and a self-sustaining income via Teladoc.[82]

The question of whether a truly Uber-style dynamic marketplace could be applied to telemedicine has received little academic or commercial attention, however. Applying smart algorithms and machine-learning to balance supply and demand in a dynamic market has the potential to dramatically reduce costs and provide meaningful income for not only physicians but nurses, nurse practitioners, and physician's assistants.

Interestingly, in the case of primary care providers or hospitals with an accessory telehealth option for their patients, their financial incentive is to discourage use of telehealth services.[83] Even though they can see a much higher volume of patients remotely, this often does not happen due to it being interspersed with in-person visits. Moreover, a

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[77] Goodman, "How the North Texas Telemedicine Revolution Began."
[78] Jeffries, Telehealth in Insurance.
[79] Goodman, "How the North Texas Telemedicine Revolution Began."
[80] "SurgiPrice."
[81] Goodman, "How the North Texas Telemedicine Revolution Began."
[82] "Income Potential With Teladoc."
[83] Dorsey and Topol, "State of Telehealth," 154.

telehealth visit yields a flat fee, maybe $45. But if a patient comes into the provider, they not only get a higher fee per visit often, but have the change to charge for accessory services, such as tests or lab work. Because of this, many providers have telehealth offerings, but neglect to market or invest in them.[84]

# 3 Does it work?

Evidence for the efficacy of Telehealth as a tool to improve outcomes while reducing cost and utilization is strongly positive. Research and published surveys consistently demonstrate positive effects on health, especially preventative, for those who actively use Telehealth services.[85] Likewise, those who use these services tend to have positive perceptions and plan on continued use.[86]

An issue, in this context, with many of these studies is that they tend not to control for how patients are informed of Telehealth options or whether they decide of their own volition to use them. Especially when employers or health plans are responsible for disseminating information about available options, they often opt for little to no communication. [87] The following section will seek to answer whether Telehealth is effective when patients are aware of and choose to use it. Education and outreach remain problems that Telehealth providers, employers, and health plans must work to solve going forward.

Moreover, few if any studies exist on the effect of adopting a Telehealth solution, such as Teladoc, as an alternative for primary care within a group, and its effect on utilization and outcomes over time. This is changing rapidly as this type of care becomes mainstream during the current pandemic and will likely push more research on its efficacy.

## *3.1 A Framework for Analyzing Efficacy*

In 1996, The National Research Council commissioned a committee to evaluate the applications and efficacy of Telemedicine. [88] Though the report is outdated, the axes of analysis they identified remain a relevant and helpful framework for holistic evaluation of Telehealth applications today. Especially with applications of remote care ranging from a phone line for nursing, to a rich video-chat with a doctor, to a chat-based system with a specialist, the following broad categories will guide this analysis of efficacy.

This analysis will adhere largely to these four axes of efficacy. They are broad enough to cover the disparate uses of Telehealth, even within nursing and primary care. Moreover, most published research on the efficacy of

[84] Jeffries, Telehealth in Insurance.
[85] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care," 370.
[86] Liaw et al., "Disconnected," 424.
[87] Jeffries, Telehealth in Insurance.
[88] Staff et al., *Telemedicine*.

Telehealth interventions focuses on at least one or more of these categories specifically.

### *3.1.1 Quality*

The first axis of efficacy, and perhaps the most obvious, is *Quality*. The NRC committee defined this metric as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[89] This is vague but contains both quantifiable and subjective attributes. Telehealth services can be evaluated as forms of preventative care in terms of whether using them prevents future need for as compared with a control group or historical data.

### *3.1.2 Cost*

*Cost* is the second axis of evaluation. The 1996 definition here is broad, coining cost as "the economic value of resource use" associated with care. As cost comes to dominate much of the discussion of our health policy system *relative* cost analysis becomes far more important. Historic attempts to adopt remote care often failed because in spite of convenience or quality, they were far more expensive than traditional modes of care.[90] Likewise, cost-reduction drives current adoption of Telehealth (COVID-19 factors aside).[91] Evidence for this kind of comparative analysis was lacking in 1996. Fortunately, many studies today provide an empirical comparative cost analysis based either on insurance claims or data collected from consumers during Telehealth visits.[92]

It should be noted that any discussion of cost is inherently tied to a discussion of utilization. The instantaneous cost of a Telehealth visit has the potential to decrease both concurrent utilization of in-person services and future needed use of care. At the same time, Telehealth may be over-utilized in place of traditional care—a victim of moral hazard. Medicare chose not to reimburse for Telemedicine procedures for decades for exactly this reason.[93]

### *3.1.3 Access*

*Access* is the third axis of evaluation. The report defines access as an ability to receive "the right care at right time without undue burden."[94] Essentially, this asks when and how a patient seeking remote care can receive it. An initial use of Telehealth was for after-hours care, but increasingly this is becoming a more relevant question.[95] As our common modes of Telehealth evolve beyond a simple call center model and toward richer and more substantive visits with physicians, hours of availability are

[89] Staff et al., 8.
[90] Staff et al., 35.
[91] Jeffries, Telehealth in Insurance.
[92] Hanne, M, and W, "Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use," 137.
[93] Staff et al., *Telemedicine*, 18.
[94] Staff et al., 8.
[95] Poole, "Telephone Triage and Advice System for Pediatric Practices."

decreasing. Amazon Care, for instance, only provides on-demand care during a limited subset of the day. It will become important to analyze specific Telemedicine programs and their efficacy in the context of how often they are available relative to potential demand.

#### *3.1.4 Acceptability*

Finally, and perhaps most perniciously, efficacy is defined by *Acceptability*. The committee defines this as "the degree to which patients, clinicians, and others are satisfied with a service or willing to use it."[96] Far more people today have Telehealth options on their existing health plans than realize it. But apathy toward the concept due to previous conceptions or general misinformation prevents its use.[97]

Equally important is whether those who know of available programs find them desirable and useful. Apps and interfaces need to be simple and user-friendly enough to convince people to open them and reach out for care in the first place. And if the experience is poor—no matter the temporary cost savings—the patient is unlikely to return to the Telehealth system.

This is among the largest barriers to Telehealth today, an important area of analysis in existing programs, and an even more important field of development moving forward.

### *3.2 Quality and Outcomes*

When applying Telehealth to primary care or nursing, quality consists of two factors. First: is Telehealth at least as safe, or better, than traditional in-person care? Second: given that baseline, can it improve outcomes as a form of preventative care? As Telehealth evolves into a tool to reduce costs rather than improve care, its baseline safety becomes the more relevant question to the stakeholders in charge of purchasing care.[98]

#### *3.2.1 Is it safe?*

Evidence that Telehealth is at least as safe or better than traditional care is iron-clad. A 2010 systematic review of 80 reviews found that over a quarter of published reviews strongly concluded in favor of Telehealth's positive effect on quality, another quarter found promising but incomplete evidence in its favor, and the latter half found no consistent analysis.[99] Few if any published studies find a deleterious effect from the use of Telehealth, either in the short or long term. This is likely because of the incredible caution Telehealth providers must take to avoid malpractice lawsuits for inherently hard-to-evaluate cases.[100]

Analysis of existing telehealth services around the world shows that nursing triage advice tends to be incredibly cautious about what level

[96] Staff et al., *Telemedicine*, 8.
[97] Dorsey and Topol, "State of Telehealth," 155.
[98] Dorsey and Topol, 154.
[99] Ekeland, Bowes, and Flottorp, "Effectiveness of Telemedicine," 739.
[100] Austin, "Are You Liable for Telephone Advice?"

of care to recommend. One meta-analysis of studies of remote triage and nursing advice systems found that, given later analysis, 84% of cases resulted in the nurse recommended the correct level of care. In the remaining 16%, the nurses recommended a higher level of care than was necessary.[101] These results span decades of study, as well. The Denver after-hours hotline in the 1990s likewise observed 107,983 calls with zero adverse outcomes. One in 1,450 calls was found to have a minor error in procedure, but with no effect on outcomes. Fears of liability in telehealth services on behalf of providers are largely alleviated by training and strong protocols. And patients can rest easy that there are few if any cases of adverse outcomes by advice to seek a lower level of care or no care at all in urgent situations.

Data on the baseline safety of more involved primary care visits, as opposed to nursing triage visits, is hard to come by. But studies of direct primary health interventions in emergency situations provide a strong suggestion of safety and a bias toward telling patients to seek higher, rather than lower levels of care. One study in Houston intervened by placing a telehealth consultation in the emergency medicine process.[102] If a patient called 911 and an EMT arrived and assessed them to be in a non-life-threatening condition, they gave the caller a tablet connected to a physician via webcam who would then give a free consultation and a reference to a clinic rather than the ER based on the severity of the condition.[103] Ultimately, most patients, per the advice of the physician, chose to go to the ER by personal transportation rather than ambulance. Only 5% opted to not seek ER care.[104] This study suggests that when more comprehensive telehealth is used in urgent situations, it never acts as a substitute for needed care, and often still refers patients to higher levels of care than may be strictly necessary.

### *3.2.2 Does it improve outcomes?*

Via its convenience and accessibility, Telehealth saves lives. This is especially true in triage or nursing care applications, where patients seek care as a first point of contact. Studies consistently extoll the preventative virtues of having this quick access to care, especially with potentially life-threatening conditions. A study of potential appendicitis cases in the Ask Mayo Clinic helpline found that callers were typically unaware of the severity of their conditions, and were advised to go to the ER immediately, thus preventing the medical complications and roughly $40,000 cost of a bust or perforated appendix.[105] A similar and more in-depth study from 2011 analyzed 20,000 calls to an appendicitis helpline. Whereas 34% of callers initially planned to seek care in person, 91% sought care within eight hours after

[101] Hanne, M, and W, "Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use," 67.
[102] Champagne-Langabeer et al., "Telehealth Impact on Primary Care Related Ambulance Transports."
[103] Champagne-Langabeer et al., 714.
[104] Champagne-Langabeer et al., 715.
[105] Hanne, M, and W, "Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use," 136.

calling, almost certainty reducing morbidity and delay of care by a huge degree.[106]

The above shows strong evidence for Telehealth as effective when it is used *in addition* to traditional means of care. Little evidence exists to quantify outcomes for telehealth as a *replacement* for traditional in-person care entirely (though the current pandemic will likely provide a wealth of data to analyze on the topic). There is some evidence from the VA that use of Telehealth reduces no-shows for important appointments, which likely confers some health benefits over time. [107] Likewise, studies of Telehealth systems tend to find that the use of that same technology to automate routine checks and reminders for things like medication can dramatically reduce error and increase compliance.[108]

But short of those studies and the potential for Telehealth in Primary Care to serve a dual role as a triage service for acute or urgent conditions, there just isn't much evidence to support it having substantive impacts on quality. And this makes sense, logically. The main benefits of Telehealth are derived what it can do that other means of care cannot—which is to be universally accessible, convenient, and cheap. It inherently can't do some functions of a primary care visit as well as an in-person visit. Even among Teladoc's unbounded litany of whitepapers extolling the benefits of their remote care model, none explicitly argue for improved outcomes apart from any triage benefits.

## *3.3 Cost and Utilization*

The questions of cost in Telehealth seems paradoxical. On one hand, proponents base its safety on studies showing that it consistently recommends an equal or higher level of care than needed, and often than initially sought out in some cases.[109] This seems to imply than the repercussion of safety is higher down-the-line utilization. But modern proponents of Telehealth champion its ability to lower costs by reducing unnecessarily utilization. The two are seemingly disparate, but evidence continually shows them to be consistent and nearly always true.

The potential of Telehealth to reduce costs ultimately comes from two sources. First, it can reduce costs by replacing existing higher-cost points of care in single instances. These are the cases of using Telehealth instead of going to the ER or the doctor's office when not strictly necessary. Second, it can reduce costs by expediting in-person care for conditions that, if left unchecked, would lead to higher costs later on.

### *3.3.1 Replacing Costly Care*

Evidence for Telehealth lowering costs by reducing utilization of unnecessary care is abundant. A cause of this is that a large portion

[106] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care," 359.
[107] Bashshur et al., 354.
[108] Bashshur et al., 370.
[109] Bashshur et al., 370.

of current care sought at a much higher level than necessary. A Canadian study of ER data found exactly this. Of 16 million ER visits in a year, only 10% resulted in hospital admissions, suggesting that many patients needed neither the cost nor full resources of the Emergency Department.[110] A study of 240 million 911 calls in the United States similarly found that over 25% of Emergency Room visits were deemed non-emergency and an excessive use of care. Moreover, the study identified a 31% increase in non-urgent EMS transport in the past decade, signaling that not only do we have high margins of waste in our care utilization, but that the problem is worsening.[111]

Visits to a primary care office or clinic have been less studied in terms of excess care, largely because no lower tier of professional care has historically existed. But beyond lowering ED admissions, a competent telehealth service for either nursing or primary care could likely cannibalize a portion of unnecessary primary care visits—something patients will likely acquiesce to due to the infamous hassle of seeing a doctor. One study found that, in the United States, it takes an average of 20 days to secure a 20-minute appointment with a physician, which will itself consume two hours of time during the day due to travel and wait.[112]

Also important are the hidden costs of a doctor's visit. Some experts estimate that Telehealth lowers costs due to lower rates of diagnostic testing.[113] By virtue of access, and often out of fear of malpractice, physicians tend to order excessive tests when in a clinical setting. But when those tests are impossible, Physicians are forced to either rely on the data at hand or recommend the client to a higher level of care.

A 2019 review of studies on Telenursing on healthcare costs and use found consistently strong results for cost savings and return on investment.[114] The Denver Health NurseLine, for example, saved an estimated $1.6 million for the provider over the course of the year relative to its $1 million cost to service 30,000 calls annually. This was calculated by comparing the cost of the service the caller initially intended to use versus the cost of the call to the health line plus the cost of the caller's final actions in accessing care.[115] A later study of a similar nursing line used insurance claims data to measure caller adherence, and found total cost of $8.7 million compared with a total savings of $13.8 million, creating a Return on Investment (ROI) for the health system of 1.59.[116] A similar study of a Swedish Telenursing line found a per-

[110] Hanne, M, and W, "Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use," 133.
[111] Champagne-Langabeer et al., "Telehealth Impact on Primary Care Related Ambulance Transports," 712.
[112] Dorsey and Topol, "State of Telehealth," 154.
[113] Dorsey and Topol, 155.
[114] Hanne, M, and W, "Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use."
[115] Hanne, M, and W, 135.
[116] Hanne, M, and W, 136.

patient net savings of $22 per call, totaling $1 million in savings per year for 25,000 calls.[117]

The savings grow more extreme when examining Telenursing access for patients with chronic conditions like Diabetes or COPD. A study of a COPD-oriented triage line in Australia found that it cost $20,040 to service 618 calls during a year, while avoiding 78 unnecessary ambulance calls, which lead to an average $4,000 hospital admission.[118]

The benefits compound when it comes to children and pediatric care. Children are among the least able to describe their symptoms, and when they feel ill after hours, parents often have only the ER to turn to. A study of 110 calls to an after-hours pediatric hotline found that of the 103 parents who had either planned to seek care in person or were unsure of what to do, 80% opted for home care alone per the nurse's recommendation.[119] This not only represents savings by reducing ER or in-person care use, but massively reduces strain on the parents and child by avoiding a difficult late-night trip possibly costing thousands of dollars.

Cost benefits extend beyond triage and nursing, though. By virtue of its low-overhead nature, Telehealth is far cheaper for payers and patients. Healthcare Bluebook, a company which compiles reports to estimate costs for various medical services around the country, places the cost of a 25-minute office visit for a privately insured patient at $172 to $212 in a city like Austin, Texas.[120] By contrast, the highest copay for any Teladoc service is $49—but typically less.[121] Better yet, most employers and consumers with access to Telehealth services like this pay a monthly subscription in the range of $3 to $10 for zero copay on visits (and in employer-based insurance, that value is usually invisibly deducted from the employee's paycheck, thus untaxed).[122]

"Won't an essentially free on-demand health service increase usage and risk moral hazard?", the keen-eyed reader asks here. The answer, surprisingly, is no. Evidence suggests that Telehealth is so cost-effective per-visit compared to traditional care that higher utilization of Telehealth has an inverse relationship with costs in large systems. Kaiser Permanente in 2016 reported that more than half of its health communications and visits were digital.[123] Yet despite that huge uptick in Telehealth use, they saw far lower costs overall.[124] Much of these savings come from the immediate point-of-care cost reduction mentioned already. But a substantial portion of

[117] Hanne, M, and W, 136.
[118] Hanne, M, and W, 136.
[119] Hanne, M, and W, 137.
[120] "Office Visit, Established Patient (~25 Min.)."
[121] Teladoc, "How Much Does a Typical Visit Cost?"
[122] Jeffries, Telehealth in Insurance.
[123] Dorsey and Topol, "State of Telehealth," 158.
[124] Dorsey and Topol, 155.

the system cost-savings are derived from better long-term outcomes.

#### *3.3.2 Preventing Future Costs via Accessible Care*

Though harder to study, preliminary evidence suggests that use of Telehealth services leads to earlier care for acute or urgent conditions while keeping people healthier and out of in-person care in the long term.

The savings in acute care are among the most significant. The 2011 study on the appendicitis hotline shows exactly this. Even though 91% of callers sought emergency care versus the 34% that initially intended to, many of those patients avoided the nearly $40,000 cost for emergency surgery after a perforated appendix. [125] Keeping people healthy, even if increasing usage in the short-term, typically saves money in the long-term.

But long-term access to Telehealth services has been shown to improve general health and reduce rates of hospitalization, care expenditures, and re-admissions. This is a basic consequence of consistent access to care—the benefits of which are borne out countless times in literature. For Medicare with Parkinson's, for example, a study found that consistent check-ins with a neurologist lowered hospitalization rates and general care expenditures.[126] These savings derived from consistent access to care extend easily to Telehealth. A 2013 UK study of a Telehealth service given to patients with chronic conditions found that in-person visits were reduced by 27% while the total cost of visits decreased over 22%.[127] And a later study giving Telehealth access to patients after stays in the hospital found that consistent check-ins with Telehealth reduced re-admission by 30%.[128]

Increasingly, Telehealth can fill the void in current care offerings to answer patient's "most common, most irritating, [and] most inconvenient" questions.[129] These are the things they may be afraid or unwilling to go to a doctor's office for. Or they may be issues with no helpful answer on Google. These are the little health issues that Telehealth can address and use to save costs in the long-term by catching problems early.

### *3.4 Acceptability and Patient Perceptions*

It's funny. Every time I tell someone I'm writing this report, they say something along the lines of "I actually just had a Telemedicine appointment the other day! But I didn't really like it." We, of course, live in strange times. The current pandemic has forced nearly all non-urgent care to be delivered remotely. And a lack of choice combined with a raft new unproven technology adopted in the span of weeks likely begets dissatisfaction.

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[125] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care," 359.
[126] Dorsey and Topol, "State of Telehealth," 155.
[127] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care," 369.
[128] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care."
[129] Dorsey and Topol, "State of Telehealth," 155.

But some of this disconnect comes from the different applications of Telehealth. It can be a lightweight triage line, it can be a supplement to primary care, and it can be a total replacement for primary care. The third option, which had never been deeply explored until the present, tends to be the least popular. But the first two options—those where Telehealth isn't a total replacement for primary care but a new level of care somewhere below it, show consistent satisfaction by patients and users. The question of acceptability in Telehealth is crucial, because it determines, regardless of whether there is access or not, if patients *actually use it*. No matter the studied cost savings, if patients don't like the system enough to use it, it is moot.

What patients overwhelmingly love about Telehealth is the convenience it offers. One patient who trialed a video-based primary care service put it succinctly: "You're sitting right in your room on your computer. How much more convenient can that be? And you don't even have to take a shower. I mean you can get on the computer, talk to the doctor, go back to bed."[130] The same limited trial that patient was a part of gave 21 random patients at Thomas Jefferson University's medical center in Philadelphia access to a video Telehealth system to replace an in-person visit. 100% of patients were satisfied with their visits, and a strong majority hoped to continue to use Telehealth as an alternative to in-person visits. Most often, they cited the convenience, quick access, and lower cost as reasons they liked the program.[131]

That same study found some barriers to acceptability, though. Technical issues bothered a substantial minority of the patients with issues ranging from problems with codes and passwords to video lag and internet outages.[132] These are issues likely to be solved as technology advances but could remain a barrier to many patients—especially the older and less technologically savvy—in adopting Telehealth.

Broader studies of usage find that, when given access, people are very comfortable using these services for certain categories of care. Text and chat-based systems, especially, are a surprisingly popular means of care for issues regarding symptoms, join pain, minor injuries, and medicine.[133] A Scottish system which connected patients with their PCPs via text likewise found that users were "pleasantly surprised at the ease of use" and found the system comforting in case of emergencies.[134]

Surveys of usage of Telehealth consistently find that, when offered, a large portion of patients choose it as a convenient alternative to traditional care and come away incredibly satisfied. A 2015 study of over 3,000 users of a Telehealth alternative to a clinic, nearly 100%

[130] Powell et al., "Patient Perceptions of Telehealth Primary Care Video Visits," 227.
[131] Powell et al., 225.
[132] Powell et al., 227.
[133] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care," 349.
[134] Bashshur et al., 350.

wanted to use the service again and would recommend it to others, while nearly a third said it was their new preferred means of care.[135] And some studies showed that patients would even be willing to pay out-of-pocket for these services, a strong indicator that they would actively use them if available.[136]

A huge barrier to acceptability of Telehealth seems to be having previously tried Telehealth. A comparative survey of users and non-users of Telehealth in the United States found that patients who consistently used it tended view it as on-par with many in-person services, but that those that hadn't yet tried it were far more suspicious of its benefits.[137] If there is a silver lining of the 2020 pandemic, it is that millions of patients are being introduced to Telehealth offerings as providers struggle to meet demand. [138] Not all experiences have been positive, but the survey in Liaw et al. found that familiarity and previous use, not previous opinion, was the highest indicator of preference for Telehealth.[139]

## *3.5 Access*

Access lies at the core of nearly every Telehealth implementation. Early Telehealth programs sought to extend access to new geographic areas or hours of the day few doctors were typically available. Modern implementations of Telehealth, though, have made great strides in providing access. Not only do lower prices tend to make care more accessible, but Telehealth is consistently used outside of normal business hours. Some systems, like the Denver after-hours program in the 1990s or the current BCBS 24/7 nursing line are designed with this universal access in mind.[140, 141]

And modern primary-care-oriented Telehealth systems like Teladoc provide this flexibility as well. The study of users and non-users of Telehealth found that the most common reasons for use were when the doctor's office was closed, when appointments couldn't be booked in time, or during weekends and holidays when typical doctor's offices are closed.[142] Given the average 20 days wait and 2 hours consumed for a 20 minute doctor's appointment, the near-immediacy of Telehealth inherently provides far greater access to care for its users.[143]

The convenience and broad acceptability of Telehealth itself drives access as well. Not only is care available in more locations and during more hours of the day, but it can be done without leaving one's home or even getting

[135] Polinski et al., "Patients' Satisfaction with and Preference for Telehealth Visits," 272.
[136] Bashshur et al., "The Empirical Foundations of Telemedicine Interventions in Primary Care," 370.
[137] Liaw et al., "Disconnected," 424.
[138] Olson, "Telemedicine, Once a Hard Sell, Can't Keep Up With Demand."
[139] Liaw et al., "Disconnected," 424.
[140] Poole, "Telephone Triage and Advice System for Pediatric Practices," 670.
[141] "24 Hour Nurse Line."
[142] Liaw et al., "Disconnected," 424.
[143] Dorsey and Topol, "State of Telehealth," 155.

dressed, and often is well suited to issues that wouldn't seem severe enough to schedule and pay for a primary care visit typically. By the virtue of making care inherently easy and low-friction, care becomes more accessible.

## *3.6 Efficacy in the Real World*

Academic studies of the efficacy of Telehealth tell a promising story. But equally important are the real-world commercial applications of the technology and analyses of whether and how they work. As mentioned earlier, many of the studies of Telehealth either use forced interventions or predominantly sample from existing users of the service. Likewise, many studies focus on extreme situations, like hotlines focused on single issues, or short trials of highly available systems which may be unsustainable in the long term.

Veterans of the employer-based healthcare industry describe the current state of Telehealth programs as a double-edged sword. When it works, and is communicated, it works fantastically. Jeffries cited stories of employees of companies he sold to who would wake up to a child with a sinus infection, make a quick Telehealth call, get an antibiotic prescription before 9am, and get hooked on the service.[144] To consumers, the convenience and increased access is unparalleled. But that success entirely depends communication. If employers don't communicate this benefit well to their employees, nearly none use it. And when Telehealth is purchased via existing providers rather than a national provider like Teladoc, the providers are reticent at best to advocate for it given the profit forfeited from lower copays and lack of diagnostic testing.[145]

The cost-reduction story is a consistent success in businesses, though. In the Washington D.C. Area, it costs on average $10 at most to add zero-copay Telehealth per employee per month. And most businesses never even realize these costs, as they simply add the same amount to each employee's monthly healthcare contribution, which goes almost universally unnoticed. [146] So as a baseline, Telehealth comes at almost no cost to businesses, and they face to gain only in savings from reduced use of higher-cost care later on.

Commercial players, both new and old, seem to be offering many of the cost and accessibility advantages seen in studies as well. Even as modern Telehealth expands its offerings to rich, interactive primary care and prescription-writing abilities, access especially continues to increase. The nascent Amazon Care, for example, offers video care from 6am to 10pm and a chat-line 24/7, both available 365 days a year.[147] And this is upgrading rapidly, as video-chat hours were only 9-5 in early February. And with its recent acquisition of virtual pharmacy PillPack, Amazon is now able to both prescribe and deliver prescriptions entirely from within

[144] Jeffries, Telehealth in Insurance.
[145] Jeffries.
[146] Jeffries.
[147] "Amazon Care."

its app.[148] Teladoc offers similar advantages. Patients can call or chat with a doctor 24/7 365 days a year as well.[149] In a whitepaper they published, Teladoc found that 93% of customers reported a reduction in costs by adopting their platform, and an episodic savings of $472 per Teladoc visit for an average patient.[150]

Wide adoption of Telehealth in industry is another sign of its commercial efficacy. Teladoc reports that as of 2019, a majority of large employers offer Telehealth services to some extent, while 51% are prioritizing its expansion this year.[151] Venture capital funding in the space has more than doubled in past decade from $1.4 to over $9 billion per year, indicating a strong commercial interest in the technology and its applications.[152] The area most lacking in adoption currently seems to be small businesses already providing healthcare. They are less profitable for large providers like Teladoc, and without a savvy insurance broker tend to overlook Telehealth as a potential offering to their employees.[153] Having been validated by the higher end of the market, it is possible that a combination of either lower prices or better outreach could lead to these companies adopting Telehealth technology as a core benefit as well.

# 4 State of the Market

This section breaks from the academic analysis of Telehealth and attempts to analyze the current state, size, and future of its commercial market. The goal is to identify what holes exist in the market, where demand may not be entirely met, and what business models have succeeded or failed in the previous decade.

Increasingly, Telehealth is a commercial rather than academic pursuit. And many in the industry argue this is necessary to sustain its growth.[154] Just as bringing the cost of renewable energy below that of fossil fuels will leverage the markets to address climate change, Telehealth must become a profitable commercial pursuit to be integrated into our health system and its beneficial effects realized.

The market is saturated with capital and companies.[155] But a growing need for these services prior to COVID-19, and the accelerated need for them thereafter creates a market of nearly all businesses providing healthcare to their employees alongside any individual purchaser of non-group insurance. This makes entry into the market possible, though still difficult.

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[148] "Amazon Care."
[149] "Teladoc | 24/7 Access."
[150] "Expanding Care through Virtual Visits," 6.
[151] "2020 Predictions."
[152] Dorsey and Topol, "State of Telehealth," 158.
[153] Jeffries, Telehealth in Insurance.
[154] Doarn and Merrell, "The Business Side of Telemedicine," 982.
[155] Calandra, "Telehealth Business: Boom Times, but Profits May Wait."

## *4.1 Demonstrated Need*

Any product, no matter its quality, requires enough demand to support a commercial business. But unlike most industries, healthcare's incentives aren't entirely aligned. Cost and health outcomes don't always see eye to eye, though they often do. So, to analyze the demonstrated need businesses have shown for Telehealth, it is important to look into the deeper needs and problems it would solve. Few companies, prior to COVID-19, actively searched for Telehealth because they fervently believed in its benefits. But they did and still do face dire problems of ballooning healthcare costs and a fight for better benefits to retain employees.

### *4.1.1 The Fight for Employees*

Prior to the Coronavirus decimating the global economy and raising unemployment to levels not seen since the Great Depression, the labor market was strong, unemployment was low, and growth in corporate funding and venture capital nearing an all-time high.[156] Especially as the younger generations stay in jobs for months to years, rather than decades, competition between well-funded companies has shifted to competing for benefits. Especially in the high-paying fields demanded by America's burgeoning tech giants, like computer science, quantitative math, and statistics, it has become a baseline expectation that companies provide far more resources than salary alone. [157] Some analyses have found that companies which provide better benefits experience up to 59% lower turnover and attrition rates.[158]

And the market for employee retention strategies has high demand. There is no shortage of guides, books, and techniques recommended to drive down the high average turnover of nearly 12% annually.[159] And the tools of increasing retention are not cheap. Stock options, healthcare, promotions, and free food are only a few of the common recommendations.[160] But these techniques are expensive, and on average account for nearly a third of an employee's cost.[161]

In the labor marketplace, differentiation will increasingly become important, and Telehealth may be a unique solution. Although Telehealth is sold primarily as a cost-saving tool, it is important to remember that businesses are not its end user. And to consumers, Telehealth is almost entirely a tool of access and convenience rather than one of cost reduction.[162] The cost benefits to the business aside, consumers love access to Telehealth

[156] Liu, "These Will Be the Buzziest Trends in Work Benefits in 2020, Experts Say."
[157] "Employee Benefit Trends Study 2019."
[158] Beheshti, "10 Timely Statistics About The Connection Between Employee Engagement And Wellness."
[159] Florentine, "Employee Retention: 8 Strategies for Retaining Top Talent."
[160] "Employee Retention."
[161] Griffin, "What Does the Average Employer Spend on Employee Benefits?"
[162] Dorsey and Topol, "State of Telehealth," 154.

when provided by their employers, and they often become regular users.[163]

Although cost may be the primary selling point of a Telehealth system for an employer, they will also gain a strong employee benefit in support of recruitment and retention for a minimal, if not net-negative cost.

In the context of the COVID-19 pandemic, the need for strong competition on employee benefits has substantially decreased. But if any benefits remain relevant as companies attempt to begin hiring as the pandemic recedes, some analysts predict them to be healthcare benefits.[164] In an era where high-fashion offices and gourmet cafeterias are no longer feasible, companies that provide genuinely useful healthcare benefits, like free Telehealth, may find themselves better able to compete with the major tech companies like Google and Facebook which have seen little if any economic harm from this downturn.

#### *4.1.2 Lowering Healthcare Costs*

It's no secret that costs for employer-sponsored healthcare are quickly outpacing inflation and becoming a primary concern of small and large companies alike. A survey of 147 large employers predicted 6% growth in healthcare costs for 2020.[165] This represents a growth of nearly $1,000 per employee per month. This will present an increasing burden on companies, especially in the economic downturn brought about by COVID-19, and the likely rise in premiums in the coming year.

As prices rise, companies are seeking novel ways to control their healthcare costs. And Telehealth is already among the primary methods of cost reduction being investigated by companies. 82% of the large corporations surveyed will offer Telehealth for minor and acute conditions by this year, and likely more in the recent pandemic context.[166]

This implies a strong demand not only for cost reduction in healthcare, but Telehealth services in particular. And although the upper echelons of the market are approaching saturation of the services—mostly dominated by nationwide providers like Teladoc, small businesses have a much lower adoption rate of Telehealth. Notably, small businesses also face 8% to 18% higher healthcare costs on average due to their smaller risk pools and decreased bargaining power.[167]

#### *4.1.3 Growing Investment as Market Validation*

Beyond a validation of business need, macroscopic market trends can be analyzed to see where venture capital money is flowing and what likely areas of growth in the coming years are.

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[163] Jeffries, Telehealth in Insurance.
[164] Galloway and Swisher, "Amazon Might Acquire AMC."
[165] Miller, "Employers' Health Costs Could Rise 6% in 2020."
[166] Miller.
[167] Miller.

Until this year, the trend has been decidedly upward. 2010 to 2016 saw a nearly 4 times growth in funding from about $1 to $4 billion.[168] Trends in recent years continue to show massive growth, with $7.4 billion invested in Digital Health in 2019 and $3.1 billion invested in the first quarter of 2020 alone.[169] And though analysts expect venture capital funding to broadly constrict the coming months, Telehealth has seen a massive infusion of venture capital cash and the stock markets have shown incredibly faith on behalf of investors in Telehealth companies.[170] Teladoc, for example, saw its value grow 216% in the between January and May 2020. This means that investment in new startups may be sparse in the coming year, but Telehealth companies are likely to see strong investment which will pick up as the economy stabilizes. Moreover, existing Telehealth companies are likely to perform well through this crisis and the end of 2020.

#### *4.1.4 And Then There Was COVID*

Since it forced us into a Telehealth-first system in January 2020, COVID-19 has brought Telehealth to the forefront of the healthcare conversation in the United States.[171] Countless primary care providers have scrambled to adopt any available Telehealth platform, leading to a litany of technical issues and rushed adoptions.[172] But this shift may be the silver bullet to bring Telehealth from relative obscurity in the eyes of consumers to a known and trusted method. [173] And as a study of reasons for use and non-use of Telehealth demonstrated, unfamiliarity with the concept led to distrust and an ultimate choice to not use it. [174] More importantly, Telehealth only succeeds in an employer-based setting when employees know about it and what it can do.[175] Otherwise, whatever slick doctor-chat app has been purchased tends to languish in obscurity.

COVID-19 has of course increased the temporary demand for these services, but in introducing the public and employers to the concept will likely kickstart its rapid growth in coming years.

### *4.2 Major Players and Technologies*

There are currently four or major commercial players in the Telehealth space. Each takes a slightly different approach to the market or niche they sell to. This section is an overview of each of the companies, including their size, founding date, technologies in use, primary customer, and relative success. Company data, if not otherwise cited, is from the CrunchBase corporate funding search tool and database.

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[168] Dorsey and Topol, "State of Telehealth," 158.
[169] Day et al., "Amidst a Record $3.1B Funding in Q1 2020, Digital Health Braces for COVID-19 Impact."
[170] Ryan, "Telehealth Startups Rake in Money During the Pandemic."
[171] Olson, "Telemedicine, Once a Hard Sell, Can't Keep Up With Demand."
[172] Coombs, "Telehealth Visits."
[173] Calandra, "Telehealth Business: Boom Times, but Profits May Wait."
[174] Liaw et al., "Disconnected," 424.
[175] Jeffries, Telehealth in Insurance.

### *4.2.1 Teladoc*

Teladoc was the first national Telehealth provider. Founded in Dallas, Texas, it is now headquartered in New York with an estimated annual revenue of about $350 million and a market cap of $13.71 billion. It has raised a total of $172 million over six rounds, including its 2016 IPO.

Teladoc specializes in business to business (B2B) sales, targeted at providing Telehealth services to employers separate from their existing insurance plan. [176] This entirely bypasses typical insurers and allows them greater flexibility in their pricing model.

They have highly developed mobile technology for consumers as well, with a simple app featuring both video and text-based chat. On the supply side, they have cultivated a dynamic network of primary care physicians and specialists in each of the states they operate, creating pieces of a two-sided marketplace.[177] This approach has led to high consumer satisfaction when used, appreciable cost savings for employers, and physicians satisfied by their ability to generate secondary income.[178]

### *4.2.2 American Well*

American Well, or Amwell, started shortly after Teladoc in 2006 and is headquartered in Boston, Massachusetts. They remain a private company having raised over $500 million in venture capital, half of which came in the past two years. Their estimated annual revenue is lower than Teladoc, between $10 and $50 million.

Rather than bypassing traditional insurers and providers entirely, Amwell takes the approach of building Telehealth technology with they then sell to healthcare providers and insurers.[179] This approach has been almost entirely orthogonal to Teladoc's employer-centered strategy, but has yielded them a firm hold on the market, with clients including UnitedHealthcare and the NewYork-Presbyterian system, totaling 55 insurers and 250 health providers.[180]

### *4.2.3 Doctor on Demand*

Founded in 2012 in San Francisco, Doctor on Demand joined Silicon Valley's Telehealth gold rush. It remains private, having raised $160.7 million through its Series C round, and sustains an estimated annual revenue of $10 to $50 million. It is a lean operation relative to Teladoc and American well, with under 250 employees. And to my sheer delight and surprise, it was co-founded by Phil McGraw, better known as Dr. Phil, and his brother Jay.

As described by their main investor, Rock Health, Doctor on Demand focused on building the most consumer-friendly interface and care platform possible, then selling it via as many

[176] Goodman, "How the North Texas Telemedicine Revolution Began."
[177] Goodman.
[178] "Expanding Care through Virtual Visits."
[179] Goodman, "How the North Texas Telemedicine Revolution Began."
[180] "Amwell."

channels as possible, including insurers, providers, employers, and direct to consumer.[181] They have contracted with employers including American Airlines, Walmart, and Comcast, alongside providing some access via Aetna, Humana, and Cigna plans.[182] It seems to have made fewer inroads into the direct to consumer market, though, as outreach channels are much more challenging and those with non-group insurance are often less likely to be purchasing add-on features beyond their existing plan.

#### *4.2.4 MDLIVE*

MDLive, or MDLIVE as they garishly style it, answers the question "what if private equity made the worst possible Telehealth product that was still marginally profitable." Founded in 2006 in Florida, it was later consumed by two $50 million private equity buyouts in 2015 and 2018. It now has under 100 employees yet boats nearly $100 million in annual revenue.

They seem to have taken the same buckshot approach as Doctor on Demand, pursuing health plans, providers, employers, and consumers directly. [183] But their prices are uniformly higher than other providers by 50% to 100% and the design and user experience of their website, mobile app, and general services is severely lacking. They seem to have found success in a lean operation, plentiful funding, and selling to the litany of employers and health providers in the United States that might need this technology.

#### *4.2.5 Startups and Smaller Companies*

Tracxn, a startup analytics tracker built by venture capital firms, noted 600 telehealth startups worldwide by the end of 2016. [184] Roughly 20 to 30 of those companies were competing in the consumer-oriented Telehealth space in competition with the four aforementioned companies.[185]

Most of these startups created some form of consumer-facing Telehealth service, ranging from triage and chat to primary care visits. But the vast majority sell via employers, likely due to the difficulty of selling on the individual market.[186]

Telehealth startups offering direct to consumer sales have flourished during the COVID-19 crisis however, as nearly $200 million in funding has been freshly injected into their bank accounts.[187] This includes Seattle-based 98Point6 which can provide diagnostic care and prescriptions over text chat, and charges $120 per year to consumers.[188] Startups like this have a spike in users alongside their inflow of cash, suggesting that consumers who can afford to are increasingly taking their healthcare into their

[181] "Doctor On Demand."
[182] "Virtual Visit Doctors and Psychologists."
[183] "Doctors On Call 24 Hours."
[184] Calandra, "Telehealth Business: Boom Times, but Profits May Wait."
[185] Calandra.
[186] Calandra.
[187] Ryan, "Telehealth Startups Rake in Money During the Pandemic."
[188] "On-Demand Text-Based Primary Care."

own hands as our system is strained nationwide.

### *4.2.6 Open Network Plans and Telehealth*

As healthcare prices continue to rise at alarming rates, novel methods are being developed to lower costs to individuals and employers. Among those is the advent of "Open Network" plans, to which Telehealth plays a key role.[189] Open network plans have the potential to play a large role in the future of employer, and even individual care in the United States if the infrastructure and knowledge around them improves.

In essence, an open network plan seeks to remote the insurer as a middleman from the costs of healthcare. This is especially relevant, as insurers are not a monolithic entity, but form a complex tree of providers. Providers like Cigna, for example, run subsidiaries to handle each part of a plan, such as pharmaceuticals or inpatient care.[190] Moreover, insurers typically reinsure their customers with other financial companies, such as AIG.[191] This leads to a system of huge inefficiencies. Many steps are inserted between the patient and the provider, and each step takes a cut of the payment. Because of this, primary care providers will often receive payment around 150% of Medicare rates, despite the patient paying nearly $300.[192]

In an open network plan, each part of the plan is directly purchased or paid for. This could include, for example, a $10,000 catastrophic coverage plan, a direct primary care plan (in which a monthly, essentially capitated rate is payed to a primary care provider for unlimited service), and the corporate equivalent of a health savings account to pay out of pocket for pharmaceuticals and other coverage below the catastrophic limit, tax-free.[193] In these plans, telehealth has a central role. Even though overall costs are typically lower, costs are payed out of pocket. This provides a strong incentive to reduce costs, which tools like telehealth effectively do. Moreover, the direct primary care practices are motivated to provide the cheapest, rather than the most care, due to the capitate rate they receive directly from the patients.[194] This means that from both ends, telehealth is a preferred means of care whenever possible. And the broad benefit of these plans is that without insurers in the middle of non-catastrophic payments, providers get a consistent stream of revenue, often at rates higher than they received from insurers.

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[189] "Transparent Open Networks."
[190] "Transparent Open Networks."
[191] Jeffries, Telehealth in Insurance.
[192] Jeffries.
[193] Jeffries.
[194] "Transparent Open Networks."

### *4.3 Total Addressable Market*

Total Addressable Market (TAM) is an estimated calculation typically performed to assess the largest possible extent of a market for a given product or sector. It attempts to extrapolate from target demographic and customer data am upper bound on the total value that could be derived from a monopoly power in the same market. This becomes useful for future analysis of a business and its competitors, allowing quick estimates of market share, relative strength, and what market share a particular business could feasibly obtain.

The calculation here is based on rough estimates and rougher assumptions, but provides a baseline estimate of the value of the market for Telehealth sold to small businesses providing Healthcare to their employees (categorized here as businesses between 50 and 500 employees). Large employers are excluded here due to inherent complexities in their health insurance, sales, and benefits processes, coupled with the fact that a majority already offer Telehealth benefits in some form.[195]

The US Census Bureau provides detailed statistics on the number of businesses in the country organized by number of employees. According to their 2017 data, there are 92,358 firms with 100 to 499 employees, and 544,485 firms with 20 to 99 employees.[196] Unfortunately, they don't segment data at 50 employees, but we can conservatively assume that 20% of the 20 to 99 group is over 50, giving us a total number of firms 50 to 499 employees of 201,255. The same calculation on the employee data from the same dataset gives us roughly 28,785,583 employees of those firms. Let's round and call it 28 million for simplicity.

According to Jeffries, an average Telehealth contract for an employer costs between $1 and $10, depending on the copay.[197] Assuming a zero-copay program and the higher per-month cost, we can estimate the annual value of the market with the following calculation.

$$\$10\ per\ employee\ month \times 12\ months \times 28\ million\ employees$$

This gives us an estimated total addressable market, for small to medium businesses purchasing healthcare, of **$3.36 billion.** In the scope of an entire market, this isn't a huge pie to slice. But given that the major players like Teladoc and others focus mainly on large 500+ employee businesses, much of this segment of the market has remained unaddressed.

# 5 What Comes Next

Of the litany of uses Telehealth has been applied to in over the past century, 2020 has kickstarted a renaissance of Telehealth in primary care. Between a growing commercial market over the past decade, strong evidence for cost savings, improved outcomes, and

[195] Miller, "Employers' Health Costs Could Rise 6% in 2020."
[196] "2017 SUSB Annual Data Tables by Establishment Industry."
[197] Jeffries, Telehealth in Insurance.

customer satisfaction, and the forced adoption caused by COVID-19, Telehealth is poised to become a powerful and dominant force in our healthcare system.

But the market is far from complete. Only a fraction of the insured population in the United States has access to Telehealth services through their employer or the individual market. Most prominent Telehealth solutions still hope to replace either nursing triage or primary care, but few attempt to bridge the gap and create a new tier of care entirely.

The market is changing rapidly and faced with a potential influx of investor capital. Successful Telehealth ventures in the coming years will likely focus on the following areas

1. **Use the current climate.** Telehealth ventures should leverage the newfound ubiquity of the concept. Consumers are almost universally familiar and at least somewhat comfortable with the idea of getting medical help remotely. Some won't like their current experiences. Identify the systemic flaws now that these systems are massively deployed and fix them.

2. **Focus on small businesses.** The long-tail of American businesses which could benefit from Telehealth is a massive and relatively neglected market compared to the multi-million-dollar contracts signed with huge corporations like AT&T and Walmart.

3. **Asynchronous care.** Not all medical issues are of the same severity, even within Telehealth. An immediate consultation may sometimes be necessary. But sometimes an issue is minor and requires a response by text later that day. Most Telehealth solutions are laser-focused on providing rich and interactive care. But Telehealth will never perfectly recreate primary care. Focus on its strengths in convenience and cost and build a system that can answer the "most common, most irritating, [and] most inconvenient" questions a patient has. A system that can provide asynchronous care just as easily as real-time will lower costs and be easier for consumers.

4. **A dynamic market with variable care.** Most Telehealth today nicely falls into the category of a phone-based nursing triage line or a fully interactive primary care medium. But primary care services are overkill for many issues, while sometimes nursing advice isn't enough. Just like Uber offers tiered rides based on car quality, create a dynamic marketplace that prices reimbursement for nursing, physicians, nurse practitioners, and more differently and dynamically, giving consumers access to exactly the level of care they need.

The future is bright for Telehealth, but it still has a long way to go. Companies and venture capitalists alike will try and sometimes fail to

strike the right balance in the coming years, each taking their piece of a multi-billion-dollar pie. But ultimately, Telehealth wisely applied can promises to save time, money, and lives.

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