IDAHO DEPARTMENT OF HEALTH & WELFARE
DIVISION OF PUBLIC HEALTH

Telehealth Environmental Scan

Literature Review

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Executive Summary

This literature review is the initial step in an ongoing telehealth environmental scan. This paper is organized as a concise summary of findings in the recent literature to orient the reader as to the status of the gaps conforming to the organizational, technical, clinical, human resources, and reimbursement aspects of telehealth. After identifying 145 articles based upon a collection of search terms, 37 were determined irrelevant to the project. The articles were categorized into five areas: organizational, clinical, technical, human resources, and reimbursement. The report authors independently reviewed each article to ensure inclusion and exclusion criteria were met, and to determine the article type, and magnitude of difference. The article type was also classified into a literature review, systematic review, original research, and perspectives. The project authors also determined the magnitude of difference in each article, which is the difference between the expected outcome of the situation under study in the literature and its actual outcome. This review identifies the key themes and compares gaps in the literature as well as highlights literature that can help to inform policy efforts at the state-level serve as a basis to help inform the remainder of the telehealth environmental scan project.

There is wide variation in the implementation of telehealth in clinics, hospitals, and health systems, both domestically and internationally. Part of this variation is due to the differences in laws, reimbursement methodologies, and the capabilities of systems administering the telehealth services, and the end-user's acceptance of technology. When reviewing the clinical aspect to telehealth, telehealth services do not replace existing in-person services, but act as an extension to patients where an access gap may exist. With attention towards substance use disorders, supplementary telehealth services are associated with fewer interruptions in substance use disorder treatment. When examining the technical aspect of telehealth, policies that reinforce the technical

Key Takeaways

- Telehealth has the capability to help bridge the gap in both primary and specialty care for healthcare access-related issues for Idahoans.
- Telehealth payment parity incentivizes providers to offer these services.
- Prescription Drug Monitoring Programs (PDMPs) are effective in curbing illicit prescription seeking behavior when mandatory use policies for the technology are also implemented.
- There is variation in the literature as to the quality of telehealth outcomes. Future studies are needed to evaluate the quality aspect as it relates to in-person versus telehealth modalities.
- Fostering increased collaboration with payers, universities, health systems and independent providers can advance telehealth capabilities in the State. This will also provide the basis for research efforts into the clinical- and cost-effectiveness of telehealth.

aspects of telehealth increase the utility and value for all stakeholders. This is certainly evident when examining the combination of mandated use policies of Prescription Drug Monitoring Programs. While telehealth services continue to grow in popularity and implementation, an area lacking in the literature is the use of a formal evaluation and assessment to guide planning, implementation, and evaluation of the success of the telehealth services. While the literature cannot always keep pace with the rapidly changing telehealth landscape, the current body of literature has provided an exceptional foundation to aid in Idaho's pursuit of improving telehealth within the State for its residents.

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Introduction

The advent of telehealth provides the basis to extend the reach and capabilities to a patient where traditional, in-person medical encounters might fall short. This extension and additional capability provide a tremendous amount of promise, but at the same time there are also shortfalls, incongruities, and sometimes lagging legal and ethical boundaries. This document serves as a review of the literature that examines the gaps related to the organizational, technical, clinical, human resources, and reimbursement-related aspects of telehealth. The operational definitions for each of the five categories are contained below. These formal definitions guided the categorization of literature discovered in this project.

- ***Organizational*** includes an entity that comprises multiple people that are working towards a common goal. As organizations are bound by legal rules for operating, literature examining the legal aspect of telehealth are included in this category.
- ***Technical*** literature entails the equipment- and machinery-related aspects involved in telehealth.
- ***Clinical*** involves literature where the focus is on an aspect of treatment for patients.
- ***Human resources*** refer to the human capital aspect of an organization – beyond the department responsible for hiring and benefits administration, human resources focuses on the people that comprise the organization or industry. This category also involves the human and usability aspect of the end-users in telehealth – the patients.
- ***Reimbursement*** refers to the variety of payment mechanisms used to compensate medical providers and facilities for rendering of healthcare services.

The project authors pay special attention to prescription drug monitoring programs (PDMPs), opioid prescribing, and opioid substance use disorder treatment. Within the organizational framework of this literature, two sub-areas covering legal and policy implications are also reviewed. For purposes of this literature review, the operational definition of a gap occurs when a difference exists between the expected outcome of the situation under study in the literature and its actual outcome.

The terms *telemedicine*, *telehealth*, and *e-health* are sometimes used interchangeably, but all have aspects related to the use of telecommunications devices in some health-related aspect. For purposes of this project, the project authors do not distinguish between telemedicine and telehealth but do distinguish between e-health and telemedicine/telehealth. All three of these terms identify

an important evolution of history and advancements made in this arena. Telemedicine involves the use of advanced communication technologies to provide healthcare services to people across geographic, time, societal, and cultural boundaries (Darkins & Cary, 2000). Telehealth is the integration of telecommunication devices to protect and promote health (Darkins & Cary, 2000). E-health is the latest iteration in this evolution. The World Health Organization (WHO, n.d.) defines e-health as the use of information and communication technologies for health. Given the rapid advancements of telehealth over a short period of time, this project identifies the differences in the expected and actual outcomes of telehealth across five domains by reviewing a body of published research. The following sections detail the methodology used to examine the literature along with the project's findings.

Methodology

Systematic criteria for inclusion and exclusion of literature were employed in gathering the research. Below is a listing of those criteria.

Inclusion and Exclusion Criteria

To enable a succinct collection of literature to incorporate in the project, we only included literature that met at least one of the following criteria:

- Peer-reviewed work published by a policy- or research-based consortium,
- government reports (state, national, or international),
- or based upon the experiences of other countries that have embraced the use of telehealth, international works that are written in English and meet at least one of the aforementioned criteria.

Search terms used in the retrieval of articles included the following key terms alone and in combination: telemedicine, telehealth, opioid, prescription drug monitoring program, rural, implementation, policy, human resources, organizational, technical, clinical, reimbursement, and compensation. Search engines, such as PubMed, JSTOR, and Google Scholar were used to retrieve literature.

Analysis of Literature

The report authors independently reviewed each article to ensure inclusion and exclusion criteria were met, and to determine the article type, and magnitude of difference. The article type was classified into one of four areas – literature review, systematic review, original research, and perspectives. A literature review provides a summary of findings from previous work. A systematic review, while related to a literature review, takes the analysis a step further by quantitatively or qualitatively synthesizing findings from a collection of studies. Original research entails secondary and primary-based research work. Perspectives include work that are editorial in nature or a provide a position-based perspective based upon a brief aspect of original research.

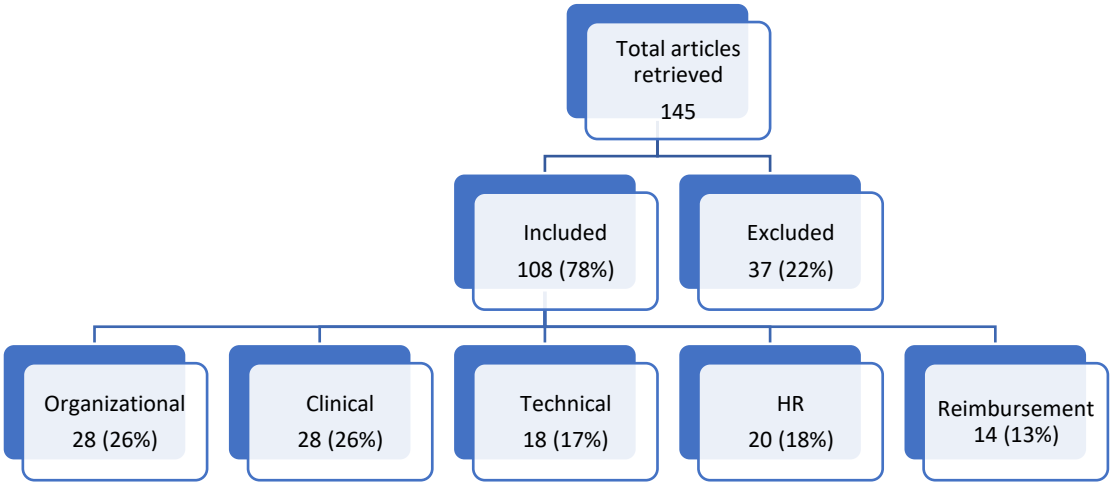
The magnitude of difference was reviewed by each project author and agreed upon as falling into one of the following four categories: no difference, marginal, moderate, and extreme. The gap represents the difference between the expected outcome of the article and the actual outcome. In cases where the project authors disagreed on the respective magnitude of difference in their independent review, a

conversation took place to agree upon the proper classification of its difference. A complete outline of each included piece of literature is contained in the Appendix.

Results

The retrieval of initial works encompassed 145 pieces of literature. After reviewing the abstracts or executive summaries for each piece, 37 were determined irrelevant to the project. Figure 1 below, outlines the works organized into each category of study with the corresponding number of pieces of literature.

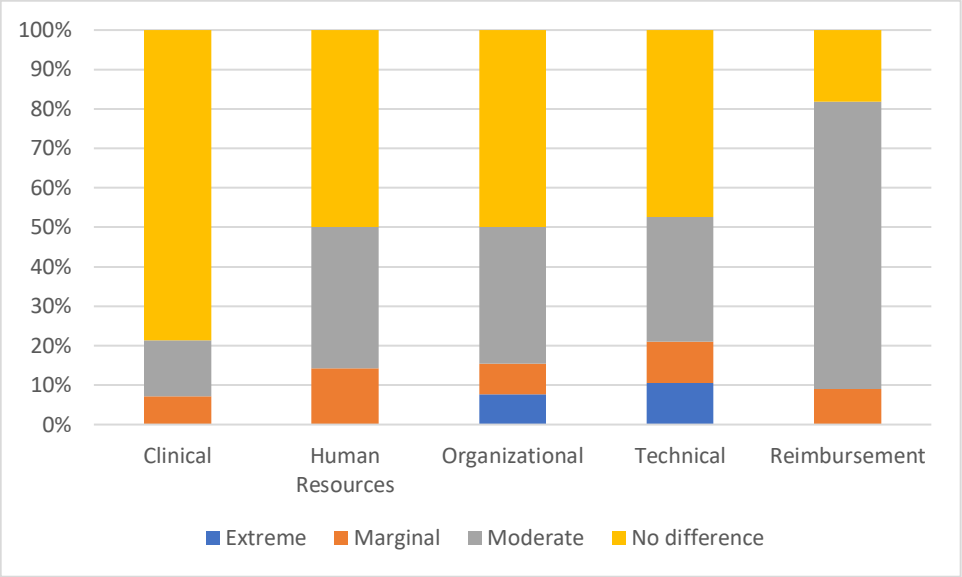
Figure 1. Literature Review Process and Classification



Source: Stonewall Analytics. Note: HR = human resources.

Figure 2 compares the differences by category in the identified literature gaps. As noted previously, the gap represents the difference between the expected outcome of the article and the actual outcome. When determining gaps in the literature, there were somewhat consistent findings in the proportion of the magnitude of gaps across human resources, organizational and technical categories of literature. The reimbursement section has a significant proportion of identified gaps in the moderate category. The clinical category did not experience as high of a proportion in gaps.

Figure 2. Comparison of Gaps in the Literature Across Four Functional Areas.



Source: Stonewall Analytics.

The following subsections present the main findings by category and highlight the associated gaps, important findings, and the consistent themes evident across the literature.

Organizational

Adoption and use of telehealth services at the organizational level not only requires an assessment of the technological capabilities for administering and receiving services, but also other factors dealing with capital, legislation, governance, usability, and change management abilities within the organization itself (Colucci, Baldo, Baldovin, & Bertoncello, 2019; Van Dyk, 2014). When assessing all of these components in their totality, the overall resounding finding in the literature is a lack of standardization and guidelines for use and implementation of telehealth capabilities (Baker & Bufka, 2011; Mehrotra et al., 2017; Nittari et al., 2020). The lack of standardization is not only relevant to literature focused on the United States, but also in international settings such as Brazil and Canada (Agarwal et al., 2020; Brown, 2013; Matheus & Ribeiro, 2009). Telehealth services have successfully filled the access gap when it comes to providing care to patients in rural and underserved areas (Davis et al., 2020).

Overall, the reception from patients and providers appears to be positive when and where telehealth has been implemented, although hurdles that stand in the way to scaling telehealth operations include lagging state laws on implementation and regulations governing how telehealth is reimbursed (Calouro, Kwong, & Gutierrez, 2014; Daniel & Sulmasy, 2015; Schmeida, McNeal, & Mossberger, 2007).

Numerous opportunities exist for the use of telehealth, however, the most commonly accepted principal is that telehealth is an extension of the provider, and not a replacement (Manocchia, 2020). Each facility must make the determination to implement telehealth based upon individual organization needs, its patient population served, and the service capability offerings (Tarakci, Sharafali, & Ozdemir, 2007). When evaluating what types of facilities that regularly employ telehealth, research has found these are larger in size, have a teaching status, and are usually non-profit (Adler-Milstein, Kvedar, & Bates, 2017).

The following subsections highlight the literature focused on the legal and policy implications as it relates to the organizational factors of telehealth[1]. Articles were referenced if most of the findings tended to focus on either the legal or policy aspects.

[1] The project authors note that legal and policies are often combined. Literature cited in the following subsections does have applicability when dealing with both legal and policy implications.

Legal Implications

When dealing with specialty care, such as pharmacy, even less regulations exist on proper reimbursement methodologies and laws on e-prescribing (Angaran, 1999). The laws and regulations that do exist tend to cover services and technologies that originated at the onset of telemedicine – the use of person-to-person video modalities, image storage and image forwarding tend to be governed (Center for Connected Health Policy, 2019; Trout, Rampa, Wilson, & Stimpson, 2017). An exception to this finding exists and it relates to pandemics (please refer to the Reimbursement section for focus on the novel coronavirus) and epidemics, such as opioid overdoses. When telehealth provides a solution for epidemics and pandemics, state and federal governments have provided specific guidance on use and monitoring (Pepin, Hulkower, & McCord, 2020).

Policy Implications

A number of policy implications reside for organizations looking to scale or even implement telehealth. One of the key policy issues is on credentialing of providers. Even when organizations and health systems have successfully implemented telehealth, licensing and credentialing issues still arise when telehealth services cross country, state, provincial, or international borders (Pong & Hogenbirk, 2002; Uscher-Pines, 2019). As a result of the interborder issues, those organizations that have excelled in their implementation tend to keep the services within the confines of regional borders (Yu, 2020).

Clinical

The clinical areas involving telehealth are numerous. Applications outside conventional primary care telehealth applications consist of telepharmacy, telepsychiatry, substance use disorder treatment, intensive care medicine, and emergency medicine, among others (Cole et al., 2019; Jensen et al., 2019; Lai et al., 2020; Sankaranarayanan, Murante, & Moffett, 2014; HHS, 2017; Young et al., 2011). As the potential specialty areas of application are wide-ranging, so are the patient characteristics that utilize telehealth services. Studies have evaluated the clinical effectiveness for telehealth in patients consisting of the elderly (van den Berg, Schumann, Kraft, & Hoffmann, 2012), inner-city youth (N. Y. Lin et al., 2020), and even Veterans (Vaughn et al., 2019). These findings suggest that all different types of patients can benefit from telehealth in terms of their usability, however, some subtleties do exist with certain patient characteristics that are most receptive to telehealth.

While there lacks a robust body of literature in comparing clinical effectiveness or quality to traditional in-person aspects of care, few telehealth studies assess the two directly. Those studies that have

compared the effectiveness or quality to in-person modalities directly tend to revolve around services for substance use disorders. Some evidence suggests that patients engaged in telehealth substance use disorder treatment for opioids tend to experience fewer interruptions in their treatment as compared to those patients engaged in in-person services (Ho & Argáez, 2018). Similar work has found that when directly comparing the effectiveness of the two approaches, there is no difference in clinical outcomes (Guille et al., 2020). This aspect of the research literature is encouraging regarding the utility in telehealth and substance use disorder treatment, especially in rural areas where access to services may be limiting.

Other work has found supplementary telehealth interventions (i.e., telehealth services provided in conjunction with in-person treatment) are associated with a positive effect on reducing or abstaining use of illicit substances (Wani & Larson, 2019; Weintraub, Greenblatt, Chang, Himelhoch, & Welsh, 2018). This body of literature surrounding supplementary telehealth interventions also fits within the notion that telehealth services are an extension of existing healthcare services, not an outright replacement (Hunkeler et al., 2000; Yellowlees et al., 2018). Within the substance use domain, patient satisfaction appears high in telehealth (Eibl et al., 2017; Gabrielian et al., 2013; Howard et al., 2018; L. A. Lin et al., 2019). In areas involving population health, positive outcomes involving weight loss (Batsis et al., 2019) and hypertension management are also well documented (Liu et al., 2017).

Technical

Much like the organizational subcategory, the abundance of literature comprising this category also highlights technical challenges due to a lack of standards around technology administration and user training. These lack of standards also extend into areas involving technical security standards (M. Jong, Mendez, & Jong, 2019; Márquez, Astudillo, & Taramasco, n.d.). Aside from technical security, interoperability between technical systems is also a large gap (Choi et al., n.d.; Gordon, Solanki, Bokhour, & Gopal, 2020). This gap is not new. For instance, medical facilities with different vendors supporting electronic health records oftentimes have limited to no interoperability between separate systems.

One area of increased focus in the technical aspect of telehealth is the technology surrounding Prescription Drug Monitoring Programs (PDMPs). PDMPs have been hailed as a tool to help curb the misuse of prescription drugs in people with substance use disorders. PDMPs allow pharmacies to have the ability to examine which prescriptions for controlled substance patients have received, even across state lines.

While the technology represents a major step in increasing transparency among medical, pharmacy, and public health professionals, the technology itself is not associated with the benefit in decreasing opioid use (Bote, 2019). The state policies mandating use of the PDMP, in conjunction with the technology is actually attributable to the reduction of opioid use (Grecu, Dave, & Saffer, 2018). This subtle, yet important aspect reinforces the importance between telehealth technology and policy. The tools and systems are not what leads to innovations in practice, but the policies and laws in conjunction with the use of the tools provide an incredible amount of value.

Despite the seemingly obvious benefits of telehealth to rural and low income areas, these areas often have a lower level of telehealth implementation (Park, Erikson, Han, & Iyer, 2018), even across a multitude of specialties (Tarakci, Ozdemir, & Sharafali, 2009). One of the rate-limiting factors is the ability for end-users to have appropriate connectivity to facilitate the use of telehealth (Steele & Lo, 2013). While telehealth is used in areas where access to medical services is limited, the technology that provides the telehealth services must be able to work in the area where the service is designed to bridge the gap.

A small proportion of the literature is devoted to formally evaluating and assessing the effect of telehealth technology on the originating-user and the end-user. As telehealth services continue to grow, the importance of evaluation and assessment will increase (Langbecker, Caffery, Gillespie, & Smith, 2017). In addition to formally evaluating telehealth implementation from a technical perspective, there is also some growth in areas of exposing providers to telehealth capabilities in their training programs. In order to reduce the burden of associated learning curves with technology and telehealth, it is recommended that practitioners incorporate the use of telehealth in their training program in order to facilitate faster learning of technology (M. Jong et al., 2019).

Human Resources

One of the most important aspects within this category corresponds to the usability for both the personnel that will provide the telehealth services, along with the end-users (Prendergast & Honey, 2019; Tye, Honey, & Day, 2017). A key aspect for successful telehealth adoption is the ability to continue fostering the underlying relationship between the provider and patient (Jansen-Kosterink, Weering, & van Velsen, 2019). Previous work has found that telehealth may actually inhibit the provider-patient relationship (Liaw et al., 2019). Coordination and facilitation with the use of telemedicine among health providers is key, as care coordination of services needs to remain uninterrupted (Rubeis, Schochow, &

Steger, 2018). Undoubtedly, there are many areas where telehealth implementation can fail or falter. Protecting the relationship between the provider and patient (in areas where telehealth services involve both) is an important aspect that the abundance of the literature captures.

Telehealth is sometimes implemented in facilities with little to no criteria to gauge its success (or failure). Key areas to assess include the users' motivations to engage in telehealth (to include providers), the cultural norms of the users, and how the technology could impede existing service offerings (Burmeister et al., 2019; Schwalb & Klecun, 2019). Utilizing a framework in the implementation and planning allows for evaluation of the success across a multitude of dimensions, to include stakeholders, the type of care delivered, and the facility where the service offering is delivered (Garcia & Adelakun, 2019). Other work has extended the planning and implementation frameworks to stakeholders outside the walls of the medical facilities, to include regional health authorities and leaders in various municipalities (Larsen, Sorensen, Petersen, & Kjeldsen, 2016).

As technology continues to evolve, the adoption of mobile phone technology and telehealth is increasingly blurred (Allaert, Legrand, Carime, & Quantin, 2020; A. S. Etim, Etim, & Scott, 2020). Even with the high adoption rate of technology among end-users, there still remains a subset of patients that have anxiety and fear in using technology to facilitate telehealth (Tsai, Cheng, Tsai, Hung, & Chen, 2019). Other aspects that could inhibit the adoption of telehealth relates to the lack of confidence in the ability to maintain privacy and confidentiality of their medical conditions (Chen et al., 2017; Rho, Yoon, Kim, & Choi, 2015; Talal et al., 2019). Some of these concerns are evident among providers, although encompassing a different spectrum. The concern among providers does not relate to lack of privacy or confidence in administering telehealth with technology, but is due to a perception that the technology could upset the status quo of services currently offered (Gagnon, Duplantie, Fortin, & Landry, 2007).

Reimbursement

The US healthcare system has a variety of payment mechanisms to compensate providers and facilities for rendering healthcare services. These payment mechanisms represent a complex approach to remuneration, each with various benefits and drawbacks. Some payment types include salary, fee-for-service, capitation, pay for performance, and diagnosis-related payments (Britton, 2015). This payment complexity also extends into telehealth. Since the introduction of telehealth inclusion in public healthcare programs in 1998, there has been consistent growth in telehealth reimbursement, albeit mixed, across the country (Brown, 2016). While growth is evident, critics point to a multitude of factors,

including limited and inconsistent reimbursement, as to why telehealth has not scaled to its full potential, especially in rural areas (Tracy, Rheuban, Waters, DeVany, & Whitten, 2008).

One area potentially inhibiting the parity of telehealth reimbursement is the lack of conclusive evidence associating cost effectiveness of telehealth and broad clinical outcomes (Whitten & Kuwahara, 2003). In a review of a number of states that do and do not participate in telehealth with Medicaid, issues among states that do participate include the spectrum of allowable services, and the continuous modification of reimbursement codes (Gray et al., 2007). Among states that do not participate in Medicaid and telehealth, consistent findings point to the need to enhance relationships to advocate the participation of telehealth and Medicaid (Gray et al., 2007).

Previous research points to the need for future studies to assess the quality and cost-effectiveness of telehealth in order to provide the foundation for more consistent reimbursement practices (Kvedar, Coye, & Everett, 2017). In a review across 46 states on the perspectives from providers receiving reimbursement for telehealth services, respondents point to overly complex administrative rules that act as hindrances to wider telehealth adoption (Antoniotti, Drude, & Rowe, 2014). Additionally, the large private payers and public payers are influential in reimbursement policies for telehealth services (Antoniotti, Drude, & Rowe, 2014).

On the timely topic of reimbursement, the project authors would be remiss if not to touch upon the status of reimbursement for telehealth due to the novel coronavirus (COVID-19). The Centers for Medicare and Medicaid (CMS) broadened access for Medicare telehealth services on March 6, 2020 under the Coronavirus Preparedness and Response Supplemental Appropriations Act. (CARES Act). This temporary measure has widened the scope of qualifiable services, removed restrictions where beneficiaries must reside, and provides an additional mechanism to receive healthcare services without ever having to enter a medical facility (Yang, 2016).

Conclusion

This literature review examined five categories and the associated key findings along with their respective gaps to assess the current state of telehealth. Across all five categories, inconsistent application, sporadic adoption, and lagging policies for reimbursement were some of the consistent findings. Going forward, this body of literature can be used as a basis to help gauge progress and to assist in design and implementation for telehealth programs. Specific to Idaho, the following sections address unique aspects the State faces as it relates to access to medical services and increasing the pace of telehealth adoption.

The ability for patients living in rural areas to connect with providers for medical services is one of the largest benefits for telehealth adoption. With over 500,000 residents in Idaho living in rural areas (out of 1.7 million total state residents), Idaho is one of several states where advancement and scaling of telehealth would represent an increase in access to medical services for a large proportion of its population. While telehealth does not replace the medical provider, it certainly provides an extension. This extension is not just limited to primary care but encompasses a wide range of services from dermatology, to pharmacy, to behavioral health, among others. Just from a geographic-based category, at the time of this writing, Idaho has 26 designed health professional shortage areas for medical, dental, and mental health. Telehealth is one mechanism to help bridge the gap between an availability of services, and where the patient resides.

To increase the success factors for furthering telehealth adoption and utilization in the State of Idaho, the literature for this portion of the project revealed some key attributes. For instance, payment mechanisms must align to incentivize providers to offer telehealth services, there must be no difference in quality outcomes of telehealth as opposed to in-person services, and continued research in both clinical- and cost-effectiveness must occur in order to advance and sustain telehealth policy adoption. As prior literature highlighted how large private and public payers oftentimes set the stage for the appetite of telehealth in particular states, targeting selected payers (both public and private) to offer additional services, even for a temporary or on a pilot-basis, would lend credence to appropriate next steps. As some telehealth restrictions for Medicare beneficiaries has been temporarily lifted under the CARES Act, future evaluations and analyses of the time period encompassing COVID-19 will yield interesting results into learning about the additional and extended telehealth services that are offered. The difference between what is typically rendered, and those services provided during the COVID-19 emergency period

could represent the portion of unmet demand in Idaho. Although only temporary, events such as pandemics point to the capabilities that telehealth can provide to not only provide medical services for patients in remote areas, but also to provide medical services to people that must be adhere to social distancing.

There is a great deal of literature that can help inform the telehealth environmental scan project; this work can also help inform The State of Idaho as it continues to approach telehealth policy. An encouraging aspect within telehealth is the resounding evidence in its ability to extend the reach of medical services, especially when it comes to treating substance use disorders. These findings also extend to the use of PDMPs, however, a subtle yet important aspect is to ensure that the technology used is also backed by effective policy mandating its use. Without such policy, telehealth will continue to see wide variation and sporadic adoption across service lines. While the literature cannot always keep pace with the rapidly changing telehealth landscape, the current body of literature has provided an exceptional foundation to aid in Idaho's pursuit of improving telehealth within the State for its residents.

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Color Coding Legend

Substance Use Disorder =
Rural Focused =
Substance Use Disorder + Rural =
Prescription Drug Monitoring Program =

Appendix

Literature Review Detailed Tables

Organizational Literature Table

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Colucci, M.	A "Matter of Communication" - A new Classification to Compare and Evaluate Telehealth and Telemedicine Interventions and Understand Their Effectiveness as a Communication Process	Literature Review		To define functions and applications of telemedicine and telehealth in order to achieve a simplified and comprehensive taxonomy.	Three functions (telemetry, telephasis, and telepraxis) and nine applications are identified. Understanding the mechanisms of telemedicine and telehealth effectiveness is crucial for a value-driven healthcare system. This new classification moves toward a new and simplified methodology to compare different studies and practices, design future researches, classify new technologies and guide their development, and finally address health policies and the healthcare provision.	No difference
Van Dyk, L.	A Review of Telehealth Service Implementation Frameworks	Perspective		To find and compare existing frameworks for the implementation of telehealth services that can contribute to the success rate of future endeavors.	A holistic implementation approach is needed, which includes technology, organizational structures, change management, economic feasibility, societal impacts, perceptions, user-friendliness, evaluation and evidence, legislation, policy and governance.	Marginal difference

Color Coding Legend

Substance Use Disorder =
Rural Focused =
Substance Use Disorder + Rural =
Prescription Drug Monitoring Program =

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Calouro, C.	An Analysis of State Telehealth Laws and Regulations for Occupational Therapy and Physical Therapy	Perspective	State	This study conducted a scan of telehealth occupational therapy and physical therapy state laws and regulations. The laws and regulations were analyzed to determine the potential effect they could have on occupational therapists' and physical therapists' utilization of telehealth.	The majority of state laws were silent regarding conducting telehealth for physical and occupational therapy. A smaller proportion of states allowed facilitation, but a wide spectrum existed between those states that helped facilitate telehealth and those states that inhibited telehealth.	Extreme difference
Davis, S. M.	Designing a Multifaceted Telehealth Intervention for a Rural Population using a Model for Developing Complex Interventions in Nursing	Perspective	National	To explore the use of a theory-based approach, the Model for Developing Complex Interventions in Nursing, and to design a pilot telehealth intervention program for a rural population with multiple chronic conditions.	The model provided a simple, structured process for designing a multifaceted telehealth intervention to minimize re-institutionalization of participants with multiple chronic conditions.	No difference
Diaz, V. A.	Direct-to-Patient Telehealth: Opportunities and Challenges	Perspective		An analysis of the Direct-To-Patient care delivery system and that methods impact on quality measures and population health.	Direct-to-patient telemedicine provides opportunities to improve access and convenience for patients and provides interactions with populations that are not currently accessing health care regularly. Its use requires continued improvement in reimbursements for the care provided, as well as overcoming patient and provider barriers to the uptake of new technology.	No difference

Color Coding Legend

Substance Use Disorder =
Rural Focused =
Substance Use Disorder + Rural =
Prescription Drug Monitoring Program =

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Yu, J.	Emerging Opportunities for Telemedicine Research in Rhode Island	Perspective	State	This paper discusses the improvements and opportunities that Rhode Island has in relation to its policies and opportunities in telemedicine services and policies.	Rhode Island has made substantial strides towards advancing the coverage of telemedicine services. Despite the state's more supportive policy environment, considerable caveats to coverage and barriers to telemedicine provision and use remain.	Moderate difference
Uscher-Pines, L.	Experiences of Medicaid Programs and Health Centers in Implementing Telehealth	Perspective	National	To explore the experiences of state Medicaid programs and FQHCs in supporting telehealth and delivering telehealth services and address how FQHCs in selected states are using telehealth, how the delivery of telehealth services is structured, barriers and facilitators of telehealth, and how Medicaid policy influences telehealth implementation.	FQHC stakeholders identified multiple barriers beyond reimbursement, including infrastructure issues (e.g., insufficient broadband), technology costs, telehealth as a cost center, billing challenges, lack of buy-in among FQHC providers, challenges specific to the patient population (e.g., elderly patients, homeless patients), complexities in adjusting clinic workflow, inadequate supply of specialists to provide telehealth services to FQHC patients, complex and time-consuming logistics around credentialing and licensing, and challenges in working with remote providers.	Moderate
Pepin, D.	How Are Telehealth Laws Intersecting with Laws Addressing the Opioid Overdose Epidemic?	Systematic Review	National	To understand how state telehealth laws intersect with the opioid overdose epidemic, they conducted a legal mapping study, a type of legal epidemiological assessment, of statutes and regulations that intersect at telehealth and opioids.	This search yielded 28 laws from 17 states. These laws intersect both telehealth and the opioid overdose epidemic in different ways including prescribing limitations, opioid treatment through medication and counseling, patient plan review, and professional collaboration.	No difference

Color Coding Legend

Substance Use Disorder =
Rural Focused =
Substance Use Disorder + Rural =
Prescription Drug Monitoring Program =

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Brunet, N.	Increasing Buprenorphine Access for Veterans with Opioid Use Disorder in Rural Clinics Using Telemedicine	Perspective	Health System	To describe barriers, facilitators and lessons learned while implementing a system to remotely prescribe buprenorphine to Veterans in rural settings.	Factors impacting adoption of the tele-prescribing intervention were mapped to the Consolidated Framework for Implementation Research (CFIR) constructs. Barriers to adoption included concerns about legality of tele-prescribing a controlled substance, conflicting interests between different stakeholders, and coordination with an existing buprenorphine program requiring more attendance and abstinence from Veterans than the tele-prescribing program required. Factors facilitating adoption included a sense of mission around combating the opioid epidemic, preexisting use of and comfort with tele-prescribing, and rural sites' control over Veterans referred to tele-prescribers.	No difference

Color Coding Legend

Substance Use Disorder =
Rural Focused =
Substance Use Disorder + Rural =
Prescription Drug Monitoring Program =

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Trout, K. E.	Legal Mapping Analysis of State Telehealth Reimbursement Policies	Systematic Review	National	To establish a legal mapping of state-level policies related to telehealth reimbursement.	In the United States, there are 24 states with policies regarding reimbursement for live video transmission. Fourteen states have store-and-forward policies, and six states have RPM-related policies. Mississippi is the only state that requires reimbursement for all three types of telehealth transmission modes. Most states (47 states) have Medicaid policies regarding live video transmission, followed by 37 states for store-and-forward and 20 states for RPM. Only 13 states require that live video will be reimbursed "consistent with" or at the "same rate" as in-person services in their Medicaid program.	No difference
Pong, R. W.	Licensing Physicians for Telehealth Practice: Issues and Policy Options	Original Research	International	Study examined the current status of licensure and liability laws as it relates to the practice of telemedicine in Canada. Future states were evaluated based upon a pro/con basis under various circumstances.	A number of obstacles stand in the way for optimal practice of telemedicine across provinces. Currently, licensure and credentials are required when the practice of telemedicine crosses borders.	Marginal difference
Tarakci, H.	Optimal Staffing Policy and Telemedicine	Original Research	Hospital	Decision framework employed to determine when and how specialty hospital should use telemedicine.	Findings suggest it does not make economic sense to always have telemedicine specialists, but a specialty hospital should always employ experts.	Moderate

Color Coding Legend

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Schmeida, M.	Policy Determinants Affect Telehealth Implementation	Original Research	National	Examines telehealth program adoption across eight years in the USA and the factors associated with positive or negative adoption.	Among other findings, nursing policy interest groups are associated with positive implementation, whereas physician policy interest groups are associated with negative implementation.	Moderate
Daniel, H.	Policy Recommendations to Guide the Use of Telemedicine in Primary Care settings: an American College of Physicians Position Paper	Perspective	National	Numerous benefits exist for providing telemedicine services for patients in geographically separated areas. Additionally, many facilities in remote areas benefit from the use of specialty services by larger institutions.	Legal and reimbursement barriers stand in the way of allowing widespread adoption of telemedicine services.	Extreme
Baker, D. C.	Preparing for The Telehealth World: Navigating Legal, Regulatory, Reimbursement, and Ethical Issues in an Electronic Age	Original Research	National	Little guidance exists for psychologists to provide telemedicine services to patients.	Specific issues that reveal a wide variation in the applicability and implementation for psychologists include HIPAA Privacy and Security Rules, the difficulty in providing informed consent, and the variation in reimbursement by third party payors.	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Mehrotra, A.	Rapid Growth in Mental Health Telemedicine Use Among Rural Medicare Beneficiaries, Wide Variation Across States	Original Research	National	Examines telemedicine utilization across state level between patients, providers, and the relationship between telemental health and in-person mental health visits. At the relationship level between in-person and telemental health visits, hypothesis was patients would use service or the other, not both.	Wide variation exists between states in their implementation and adoption of telemental health. Also, patients that utilize in-person mental health are also associated with telemental health visits (patients don't tend to use one service versus the other).	Moderate
Cahana, A.	Redesigning Delivery of Opioids to Optimize Pain Management, Improve Outcomes, and Contain Costs	Original Research	Health System	Guidelines are presented for a five-component model of pain management used for clinical practice	The suggested model is more patient-centered and uses a measurement-based approach for optimizing care for patients dealing with chronic pain.	No difference
Rajan, B.	Service Systems with Heterogeneous Customers - Investigating the Effect of Telemedicine on Chronic Care	Original Research	National	Evaluates the implementation of telemedicine with specialists through the lens of revenue maximizing versus welfare maximizing states.	The use of telemedicine enhances social welfare with specialists. Some patients, however, are worse off with the full implementation of telemedicine based upon certain socioeconomic statuses.	Marginal
Center for Connected Policy	State Telehealth Laws and Reimbursement Policies	Original Research	National	An examination of the state of reimbursement and trends across each state for Medicaid patients.	Live video modalities are by far the most consistent across each state; store-and-forward and remote patient monitoring have high degrees of variability in Medicaid reimbursement.	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Center for Connected Policy	State Telehealth Medicaid Fee-For-Service Policy.	Original Research	National	To assess trends in in Medicaid fee-for-service, identify changes and progress in specific areas, and provide context to the current telehealth policy landscape.	Many states now refined and expanded their Medicaid fee-for service offerings to provide compensation for a wide array of provider types and telehealth services. States have adopted coverage for remote patient monitoring in specific settings, such as home health care.	No difference
Adler-Milstein, J	Telehealth Among US Hospitals: Several Factors, Including State Reimbursement And Licensure Policies, Influence Adoption	Original Research	National	Examined the extent of telemedicine adoption at hospitals based upon teaching status, size, and for-profit status.	Larger, teaching hospitals that are non-profit tend to have a greater adoption of telehealth systems than others.	Moderate
Manocchia, A.	Telehealth: Enhancing Care through Technology	Perspective	State	Examines the state of telehealth in Rhode Island along with the coverage provided by Blue Cross & Blue Shield in this arena.	Position is telehealth is not a replacement for the primary care physician, but an extension to those patients that need care when/where they cannot receive it in-person.	No difference
Angaran, D. M.	Telemedicine and Telepharmacy: Current Status and Future Implications	Perspective	National	Numerous benefits exist for providing tele-pharmacy services to patients (e.g., access to care, greater efficiencies, high productivity).	The legal and ethical barriers remain in the way of full optimization of the Internet for telemedicine, as opposed to other industries that have fully embraced the technology.	Moderate
Matheus, R.	Telemedicine in Brazilian Public Policy Management	Perspective	International	Telemedicine can increase the number of educational programs, reduce patient transfers and transportation costs, and allow for quick access to specialists when caring for patients.	Telehealth changes the balance between the patient-provider relationship, introduces the possibility for technology failures and loss of medical information, has a high cost for some technology to be adopted, and licensure limitations exist when crossing borders.	Marginal

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Agarwal, P.	Telemedicine in the driver's seat: New Role for Primary Care Access in Brazil and Canada: The Besrour Papers: A Series on the State of Family Medicine in Canada and Brazil	Original Research	International	Compares and contrasts the adoption of telemedicine in Brazil as opposed to Canada.	Regulatory system in both countries prevents greater adoption and utilization of telemedicine; ubiquitous compensation strategies are also missing in both countries.	Moderate
Nittari, G.	Telemedicine Practice: Review of the Current Ethical and Legal Challenges	Literature Review	International	Highlights the current state versus what still needs to be done to advance the state of telemedicine in Italy.	Large gaps in ethical, legal, legislation, and service providers remains rampant, preventing a systematic scale-up of adoption and use. Specific concerns reside around data privacy and lack of clear legislation to help regulate this sub-industry.	Extreme
Brown, E. M.	The Ontario Telemedicine Network: A Case Report	Original Research	International	Current status and future trends of use in telemedicine through non-profit in Ontario.	Improved outcomes, reduced hospital admissions, and increased access to care has been associated with adoption of telemedicine in Ontario.	No difference

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Clinical Literature Table

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Lai, J. T.	A Pilot Study of a Telemedicine-based Substance Use Disorder Evaluation to Enhance Access to Treatment Following Near-Fatal Opioid Overdose	Original Research	Health System	Implementation of a telemedicine protocol for post ED overdose care of near fatal overdoses.	Pilot study was able to provide substance use assessments and evaluations in the emergency department to patients that suffered near-fatal opioid overdoses.	No difference
Sankaranarayanan, J.	A Retrospective Evaluation of Remote Pharmacist Interventions in a Telepharmacy Service Model Using a Conceptual Framework	Original Research	Health System	Evaluated a tele-pharmacy service model using a conceptual framework to compare documented remote pharmacist interventions by year, hospital, and remote pharmacist and across rural hospitals with or without an on-site rural hospital pharmacist.	This is one of the first studies to demonstrate the patient- and health system-centered nature of pharmaceutical care delivered via a tele-pharmacy service model by evaluating documented remote pharmacist interventions with an analytical framework.	No difference
Howard, A.	Adult Experts' Perceptions of Telemental Health for Youth: A Delphi Study	Systematic Review	State	Assessed perception of adults who experienced youth depression or suicidality, parents of youth with lived experience, and professionals on telemental health (TMH) services.	Adult experts identified stigma and knowledge barriers to youth mental health care. Although TMH is perceived as beneficial for screening, education, follow-up, and emotional support, no single delivery method (e.g., websites or instant messaging) was deemed universally beneficial.	No difference
Khairat, S.	Advancing Health Equity and Access Using Telemedicine - A Geospatial Assessment	Original Research	State	This article evaluates the reach and context of a virtual urgent care (VUC) program on health equity and accessibility with a	The study concluded that patients facing inequities from rural areas had increased health care access by utilizing the VUC.	No difference

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
				focus on the rural underserved population.		
Yellowlees, P.	Asynchronous Telepsychiatry: A Component of Stepped Integrated Care	Original Research	Health System	A 5-year clinical trial comparing asynchronous telepsychiatry (ATP) with synchronous telepsychiatry (STP) consultations.	Implementing ATP in existing integrated behavioral healthcare models could make mental healthcare more efficient.	No difference
Gabrielian, S.	Chronic Disease Management for Recently Homeless Veterans: A Clinical Practice Improvement Program to Apply Home Telehealth Technology to a Vulnerable Population	Original Research	Clinic	To evaluate the satisfaction of homeless Veterans with the use of Care Coordination Home Telehealth (CCHT).	Despite an extremely small sample size of study participants (n=14), the subset was satisfied with use of CCHT.	No difference
Jensen, A.	Description of A Pharmacist-Led Clinical Video Telehealth Group Clinic for Opioid Overdose Prevention and Naloxone Education	Original Research	Hospital	To improve access to opioid overdose prevention and naloxone education to high risk patients in rural and urban areas.	The pharmacist-led clinical video telehealth group clinic were more likely to be considered high risk. This intervention has been an efficient strategy to extend overdose education and naloxone distribution (OEND) services to high-risk patients beyond central, urban areas.	No difference
Eaton, L. H.	Development and Implementation of a Telehealth-Enhanced Intervention for Pain and Symptom Management	Original Research	Health System	Describes the development and evaluation of a telehealth intervention (TelePain) designed to address the need for pain specialist consultation regarding pain and symptom management issues in non-academic medical centers.	This study lacks firm evidence of success, however, it does acknowledge the difficulty in overcoming geographic barriers, enrolling patients into protocols and getting specialists to attend additional training.	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Hunkeler, E. M	Efficacy of Nurse Telehealth Care and Peer Support in Augmenting Treatment of Depression in Primary Care.	Original Research	Clinic	Randomized trial comparing usual care, telehealth care, and telehealth care plus peer support.	Nurse telehealth care improves clinical outcomes of antidepressant drug treatment and patient satisfaction and fits well within busy primary care settings.	No difference
Weintraub, E.	Expanding Access to Buprenorphine Treatment in Rural Areas with the Use of Telemedicine	Original Research	Clinic	Retrospective chart review of 177 patients in a rural drug treatment center that were treated with buprenorphine through telemedicine.	Treatment with buprenorphine can be effectively delivered by telemedicine to patients with opioid use disorders in a rural drug treatment program.	No difference
Batsis, J. A.	Feasibility and Acceptability of a Rural, Pragmatic, Telemedicine-Delivered Healthy Lifestyle Programme	Original Research	Health System	Testing the effectiveness of a live, two-way video-conferencing modality as part of a evidence-based health lifestyle program.	A telemedicine-delivered, intensive weight loss intervention is feasible, acceptable, and potentially effective in rural adults seeking weight loss.	No difference
Huskamp, H. A.	How Is Telemedicine Being Used in Opioid And Other Substance Use Disorder Treatment?	Systematic Review	National	Using claims data for 2010–17 from a large commercial insurer, we identified characteristics of tele-SUD (substance use disorder) users and examined how tele-SUD is being used in conjunction with in-person SUD care.	Tele-SUD is primarily used to complement in-person care and is disproportionately used by those with relatively severe SUD. Given the severity of the opioid epidemic, low rates of tele-SUD use represent a missed opportunity.	Moderate
Cole, J.	Impact of Pharmacist Involvement on Telehealth Transitional Care Management (TCM) for High Medication Risk Patients	Original Research	Health System	This pilot study sought to evaluate the impact of pharmacist involvement in the preexisting telehealth transitional care management (TCM) program at Atrium Health on the quality and	Overall, TCM Pharmacists identified and resolved 80 medication-related problems, improved access to medication therapy, provided comprehensive medication counseling, and bridged gaps	No difference

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
				safety of the medication discharge process for high medication risk patients.	in care following hospital discharge.	
Young, L. B.	Impact of Telemedicine Intensive Care Unit Coverage on Patient Outcomes: A Systematic Review and Meta-analysis	Systematic Review	International	A meta-analysis to examine the impact of tele- medicine ICU (tele-ICU) coverage on mortality and length of stay (LOS).	Tele-ICU coverage is associated with lower ICU mortality and ICU LOS but not with lower in-hospital mortality or hospital LOS.	Moderate
Talal, A.	Integrated, Co-Located, Telemedicine-Based Treatment Approaches for Hepatitis C Virus (HCV) Management for Individuals on Opioid Agonist Treatment	Original Research	Health System	Evaluating the effectiveness of telemedicine to treat Hepatitis C Virus on patients with opioid antagonist treatment.	Telemedicine-based HCV treatment is a feasible reimbursement model for HCV treatment delivery in a opioid antagonist treatment (OAT) program and had excellent patient acceptance.	No difference
Mahmood, T.	Monitoring Data Quality for Telehealth Systems in the Presence of Missing Data	Original Research	International	Testing a method to account for missing data in the real time monitoring of patient blood pressure.	Method tested was successful for handling missing patient data.	No difference
Mahmood, T.	Monitoring Data Quality for Telehealth Systems in the Presence of Missing Data	Original Research	International	Testing a method to account for missing data in the real time monitoring of patient blood pressure.	Method tested was successful for handling missing patient data.	No difference
Vaughn, I. A.	Multispecialty Opioid Risk Reduction Program Targeting Chronic Pain and Addiction Management in Veterans	Original Research	National	Examines the extent of integrating pain management telehealth within primary care to reduce opioid prescription rates in the Veterans Administration	Integrating primary care with telemedicine program aimed at reducing opioid prescriptions has a significant effect in VA populations.	No difference
Wani, R.	PDG75 Impact of Telehealth Interventions on the Reduction or	Systematic Review	International	Determine the effectiveness through meta-analysis of randomized control trials of	Supplementary interventions through telehealth generally have a positive impact on	No difference

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
	Abstinence of Illicit Drug Use: A systematic Review and Meta-Analysis.			telehealth in treating and reducing the consumption of illicit substances and alcohol.	reducing or abstaining the consumption of illicit substances among adults.	
Garber, R.	Pictures Influence the Decision to Transfer: Outcomes of a Telemedicine Program Serving an 8 State Rural Population	Original Research	Health System	To evaluate if using photographs would improve consistency on-call burn provider assessments.	Implementation of a telemedicine program has increased efficiency of resource utilization and timely resuscitation and transfer of patients requiring management in a burn center.	No difference
Liu, C.-K.	Population Health Management Outcomes Obtained Through a Hospital-Based and Telehealth Informatics-Enabled Telecare Service	Original Research	Hospital	Determining the effectiveness of a hospital-based and telehealth informatics-enabled telecare service model. This 24/7/365 service model features (1) effective integration of health data such as electronic health record, electronic medical record and personal health record, (2) establishment and use of personalized vital sign base lines, (3) design and use of insightful new specific rating scales, and (4) use of well-defined operating procedures for conducting performance in a stringent regulatory environment.	Identified the success of important population health management related strategic goals such as (1) reducing time to access proper medical service, (2) reducing rate of emergency visit, (3) reducing rate of readmission, (4) reducing hospital stay, (5) reducing possible medical errors, and (6) reducing harms caused by possible overuse and/or underuse of medical services. Significant outcome examples in relation to management and prevention of hypertension, stroke and medical error are presented.	No difference
Ho, C	Telehealth-Delivered Opioid Agonist Therapy for the Treatment of Adults with Opioid Use Disorder: Review of	Literature Review	International	To determine the effectiveness of telehealth-delivered opioid agonist therapy in patients with opioid use disorder.	Limited evidence from one non-randomized retrospective study showed that after one year of treatment, those who participated in telehealth-	Marginal

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
	Clinical Effectiveness, Cost-Effectiveness, and Guidelines				delivered OAT were more likely to remain on uninterrupted OAT than those who received in-person OAT.	
Lin, N. Y	Telehealth Delivery of Adherence and Medication Management System Improves Outcomes in Inner-City Children with Asthma	Original Research	Clinic	To assess the feasibility and efficacy of a novel school-based care delivery model that incorporates video-based telehealth (VBT) medical and self-management visits with electronic inhaler monitoring to improve asthma outcomes.	This study demonstrates that a multi-component medical and behavioral interventional program delivered by VBT to a school- based setting is feasible and can significantly improve asthma outcomes and care in a challenging population.	No difference
van den Berg, N.	Telemedicine and Telecare for Older Patients—A Systematic Review	Literature Review	International	To assess the impact and range of services associated with telemedicine in medical care for the elderly.	Predominantly positive results with a clear trend towards better results for “behavioral” endpoints (e.g. adherence to medication or diet, and self-efficacy) compared to results for medical outcomes (e.g. blood pressure, or mortality), quality of life, and economic outcomes (e.g. costs or hospitalization).	Moderate
Lin, L. A.	Telemedicine-Delivered Treatment Interventions for Substance Use Disorders: A Systematic Review	Literature Review	International	Examined the effectiveness of telemedicine interventions for substance abuse disorders, with a focus on videoconferencing-delivered medication or psychotherapy treatments. This included opioid, alcohol, and nicotine disorders.	Overall, studies suggest high patient satisfaction and the effectiveness of telemedicine. The limitation of current methods and the need for more research is also emphasized.	Marginal

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Eibl, J. K.	The Effectiveness of Telemedicine-delivered Opioid Agonist Therapy in a Supervised Clinical Setting	Original Research	National	A comparison of the effectiveness of opioid agonist therapy done in person versus that done via telemedicine.	Patients treated via telemedicine were more likely to be retained in therapy than patients treated in-person. Telemedicine may be an effective alternative to delivering in person OAT, and it has the potential to expand access to care in rural, remote, and urban regions.	No difference
Guille, C.	Treatment of Opioid Use Disorder in Pregnant Women via Telemedicine: A Nonrandomized Controlled Trial	Original Research	Clinic	To compare maternal and newborn outcomes among pregnant women with OUD receiving care via telemedicine vs in person.	In this nonrandomized controlled trial, virtually integrated OUD care in obstetric practices produced similar maternal and newborn outcomes compared with in-person care.	No difference
RTI International	Using Telehealth to Identify and Manage Health and Substance Use Disorder Conditions in Rural Areas	Systematic Review	National	To understand how telehealth is used to support behavioral health and SUDs, with a particular focus on implications for medication-assisted treatment for opioid use disorders. The intent was to understand telehealth implementation and use, financing and sustainability, and impact in the field.	Telehealth is used in a variety of ways for provider-to-patient and provider- to-provider interactions. Provider-to-patient interactions included real-time live video, remote monitoring, and asynchronous communication. Provider-to-provider interactions included education and consultation. Organizations varied in how they implemented telehealth services and the services they offered. Common themes arose in implementation, such as planning for both technical	No difference

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
					and organizational impacts of telehealth, the importance of leadership support, and tailoring programs to community needs. Financing and sustainability themes included inconsistent interpretation of policies about delivering telehealth services, which influenced which services organizations chose to implement. Funding telehealth was accomplished through a variety of methods, such as grants and demonstration programs, and reimbursement varied by payer. Telehealth affected behavioral health services by providing improved access to different types of services, such as specialty services and translation, and extending delivery of services.	

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Technical Literature Table

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Park, J	Are State Telehealth Policies Associated with The Use Of Telehealth Services Among Underserved Populations?	Original Research	National	Increased adoption of live video, live chat, texting and mobile apps in telehealth use over time	Underserved populations, including Medicaid, low income, and rural populations did not fare well in telehealth as widely as other groups.	Moderate
Andreoli Petrolini, V.	Collaborative Telepathology in a Statewide Telemedicine Environment - First Tests in the Context of the Brazilian Public Healthcare System	Original Research	International	Use of telepathology to improve and accelerate the process of a diagnosis is explored through an applied case study.	Good results achieved in accuracy, effectiveness, learnability, and comfort	No difference
Kvedar, J.	Connected Health: A Review Of Technologies And Strategies To Improve Patient Care With Telemedicine And Telehealth.	Original Research	National	Study of telemedicine and telehealth applications that improve quality, outcomes, and reduce costs.	Positive outcomes are found by this study looking at things such as medication adherence and reducing referral wait times.	No difference
Chern, C.-C.	Decision Tree-Based Classifier in Providing Telehealth Service	Original Research	International	Study aims to address the problem of identifying the patients who are the best candidates in receiving subsidized telehealth services.	Model adequately solved telehealth service classification problems.	No difference
Parmanto, B.	Development of the Telehealth Usability Questionnaire (TUQ)	Original Research	National	Development of a usability questionnaire to examine the telehealth technology with users.	Results of the TUQ were found to have good to excellent reliability.	No difference
Ekeland, A. G.	Effectiveness of Telemedicine: A Systematic Review of Reviews	Systematic Review	International	Examines the impact and costs of telemedicine services.	21 studies found that telemedicine is effective and 18 were promising but were relatively incomplete.	Marginal

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Jong, M.	Enhancing Access to Care in Northern Rural Communities via Telehealth	Original Research	International	Promising benefits include increased access to health care and reduced expenditures for patients living in remote regions.	Recommend training providers in telehealth while they are still in training as opposed to providers later in their careers due to ability to learn new technology.	Marginal
Márquez, G.	Exploring Security Issues in Telehealth Systems	Systematic Review	National	Analysis into security protections in the technology used in telehealth systems.	41 studies in total, only 4 had identified security issues and 3 were able to handle the security issues.	Extreme
Marshall, B. D. L.	Harm Reduction for Young People who Use Prescription Opioids Extra-Medically: Obstacles and Opportunities	Perspective	National	Examines substance use disorders among relatively young patients (18-25) and the possible strategies to reduce key harm.	Technology and telemental health offered as potential solutions, however, not an abundance of evidence.	Moderate
Gordon, H. S.	"I'm Not Feeling Like I'm Part of the Conversation" Patients' Perspectives on Communicating in Clinical Video Telehealth Visits	Original Research	National	Looks at the clinical video telehealth (CVT) capabilities for patients with Type II diabetes, specifically examining their perspectives and barriers to communication using telehealth.	Lack of consistency in providers, inability for physical examination, and difficulty communicating with the technology led to identified barriers, although positives such as increased access were identified.	Moderate
Savaris, A.	Integrating a PACS Network to a Statewide Telemedicine System - A Case Study of the Santa Catarina State Integrated Telemedicine and Telehealth System	Original Research	International	Examines the implementation of integrating a PACS infrastructure in a statewide telemedicine system.	Results provided for construction of a robust, scalable, and secure solution in picture archiving.	No difference
Grecu, A. M.	Mandatory Access Prescription Drug Monitoring	Original Research	National	Estimates the effect of prescription drug monitoring programs	No substantial effects of instituting an operational PDMP, however,	Extreme

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
	Programs and Prescription Drug Abuse			(PDMPs) in limiting prescription drug abuse.	mandatory-access provisions (policy) of the PDMP significantly lower drug abuse.	
Tarakci, H.	On the Staffing Policy and Technology Investment in a Specialty Hospital Offering Telemedicine	Original Research	International	To determine the optimal investment level in telemedicine technology with the tradeoff being between accuracy/quality and cost.	In not all cases should a specialty hospital enter into or offer telemedicine services - the right mix of patients, providers, and technology is needed as a basis.	Moderate
Alonso, S. G.	Predictive, Personalized, Preventive and Participatory (4P) Medicine Applied to Telemedicine and eHealth in the Literature	Literature Review	International	Examines the extent to which predictive, personalized, preventive and participatory medicine is applied to telehealth	While somewhat limited in research numbers, the intended outcomes of the 4P areas is strong and is suspected to continue is growth and adoption in the coming years.	No difference
Tomkins, S.	Rapidly Personalizing Mobile Health Treatment Policies with Limited Data	Original Research	National	New implementation of machine learning to provide learning of personalized policies based upon users data in telehealth applications	Results revealed 26% lower regret than state-of-the-art models.	No difference
Steele, R.	Telehealth and Ubiquitous Computing for Bandwidth-Constrained Rural and Remote Areas	Literature Review	National	Examines how ubiquitous computing in rural areas could bring non-traditional approaches to telehealth with bandwidth-constraints.	Instead of using traditional, bandwidth heavy telehealth devices (traditional videoconferencing), the use of mobile phones and other commonly available technology could provide the bridge for rural residents in bandwidth limited areas.	No difference

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Choi, Y. B.	Telemedicine in the USA: Standardization Through Information Management and Technical Applications	Original Research	National	The needs for telemedicine standards and classifications of various standards in telemedicine are presented.	There is a need for telemedicine code standardization of drugs and health care providers, multimedia-conferences standards, and information security management.	Moderate
Langbecker, D.	Using Survey Methods in Telehealth Research: A Practical Guide	Original Research	National	There is wide variability in assessing clinician and patients' attitudes and perceptions as it relates to telehealth. Study looks to provide common survey outcomes and instruments to provide standardization in this area.	A practical guide is presented for assessing various indicators and outcomes in telehealth settings for patients and users.	No difference
Bote, S. H.	U.S. Opioid Epidemic: Impact on Public Health and Review of Prescription Drug Monitoring Programs (PDMPs)	Literature Review	National	Examination of studies on opioid misuse and the ability for PDMP to curb the high rates of abuse.	While promising, the variation in state use and variation in mandated use limits interoperability and overall potential in being a meaningful decision support tool.	Moderate

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Human Resources Literature Table

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Garcia, R.	A Conceptual Framework and Pilot Study for Examining Telemedicine Satisfaction Research	Systematic Review	International	A conceptual framework on telemedicine can provide a starting point for evaluating and comparing studies while providing new direction for future research.	Using a conceptual matrix, researchers have synthesized the results into a framework that includes satisfaction dimensions, stakeholders, type of care, type of system, context and methodologies.	No difference
Tsai, J.-M.	Acceptance and Resistance of Telehealth - The Perspective of Dual-Factor Concepts in Technology Adoption	Original Research	International	This study used a research model based on the dual-factor concepts of “enablers” and “inhibitors” to explain users’ intentions to utilize telehealth.	Technology anxiety and transition costs are the key factors in discouraging people from using telehealth. Technology anxiety could be overcome through the perceived usefulness to promote the adoption of telehealth.	No difference
Nasir, J. A.	An Integrated Planning Approach Towards Home Health Care, Telehealth and Patients Group Based Care	Original Research	Health System	The study is about resource allocation. In this study, a Home Health Care (HHC) planning problem is introduced to integrate the resource dimensioning issues and assignment aspects with the telehealth-based care and patients’ group-based care services.	The main aims of the proposed model are: (i) to provide an optimal selection of locations for HHC offices, health care workers, and patients’ cluster centers besides their specific assignment; (ii) to schedule the health care session for each patient or patients’ group by creating a pair of HHC nurse and telehealth staff against a specific time window; and (iii) to seek the enhancement of patient	No difference

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
					satisfaction and quality of service considering the penalties for violation of patients' preferences and inappropriate experience gap between the pair of nurses.	
Liaw, W. R.	Disconnected: A Survey of Users and Nonusers of Telehealth and Their Use of Primary Care	Original Research	Health System	The study sought to assess awareness, perceptions, and value of telehealth in primary care from the perspective of patients.	Telehealth users reported that they relied on live video for enhanced access and were less connected to primary care than nonusers were. Telehealth may expand service access but risks further fragmentation of care and undermining of the primary care function absent better coordination and information sharing with usual sources of patients' care.	-

Color Coding Legend

Substance Use Disorder =
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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Gagnon, M.	Exploring the Effects of Telehealth on Medical Human Resources Supply: A Qualitative Case Study in Remote Regions	Original Research	International	The aim of this research was to explore physicians' and managers' perceptions regarding the potential of telehealth to support recruitment and retention of physicians in remote and rural regions.	Interviews highlighted the impact of telehealth on several factors influencing the recruitment and retention of physicians in rural and remote regions. The effects of telehealth on physicians' choice of practice location could be seen at the professional, organizational, educational and individual levels. There are also certain limits related to telehealth, such as the fear that it would eventually replace all continuing medical education activities and onsite specialists in remote regions.	Moderate
Etim, A. S.	Mobile Health and Telemedicine - Awareness, Adoption and Importance of Health Study	Original Research	Health System	This paper reports a study that investigated importance of health, mobile health (m-Health) and telemedicine awareness along with its adoption in a health disparate community that has one of the Historical Black Colleges & Universities (HBCUs) in the country.	While all participants owned a mobile phone with smart features and a large proportion them indicated that their health was very important to them, there was lack of awareness and adoption of m-Health and telemedicine.	Moderate
Jansen-Kosterink, S.	Patient Acceptance of a Telemedicine Service for	Original Research	Clinic	The aim of this article is to look beyond the common theoretical	Facilitators included the possibility to exercise from the comfort of home, the	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
	Rehabilitation Care - A Focus Group Study			approaches towards end-user acceptance (like the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology), and to explore the factors that contribute to or hinder the acceptance of a telemedicine service for rehabilitation care by patients with a chronic disease.	ability to work on one's recovery, irrespective of the time schedule of care professionals, and improved quality of exercise instruction, due to the provision of exercise videos on the portal. Barriers included a lack of intrinsically motivation, experiencing portal-mediated communication with care professionals as 'impersonal', and the lack of physical space and rest to properly exercise at home. Generally speaking, participants were enthusiastic about the idea to provide the telemedicine service as a follow-up treatment as they liked to be in contact with their therapist and to continue training.	
Rubeis, G.	Patient Autonomy and Quality of Care in Telehealthcare	Systematic Review	National	This paper examines the ethical implications of telehealth, focusing on patient autonomy and quality of care by analyzing metareviews, randomized controlled trials and narrative ethical analyses on the topic.	The technically enhanced encounter between patients and health professionals may mean an empowerment of patient autonomy when it goes along with a personal relationship based on trust, assistance and support. When it comes to the	Marginal

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
					quality of care, telehealth may lead to an improvement as long it is adopted to the patient's individual needs.	
Talal, A. H.	Patient Reaction to Telemedicine for Clinical Management of Hepatitis C Virus Integrated into an Opioid Treatment Program	Original Research	Clinic	To evaluate the diffusion of telemedicine within the OTP, they conducted a pilot study to assess acceptance of and satisfaction with telemedicine among 45 HCV-infected opioid use disorder (OUD) patients on methadone.	Patients demonstrated their acceptance of telemedicine-based encounters by referral of additional participants. They highlighted the convenience of on-site treatment with a liver specialist through recognition of the benefit of "one-stop shopping." They also expressed confidence in the privacy and confidentiality of telemedicine encounters.	-

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Tye, M. L.	School-Based Telemedicine - Perceptions About a Telemedicine Model of Care	Original Research	International	This study aimed to investigate perceptions of the non-clinical school staff involved on this telemedicine model of care.	Delivering telemedicine enhanced interactions with children. Environments related to practices and physical characteristics of the school were viewed as constrainers and enablers for delivery. School-based telemedicine delivered by school staff is perceived as an acceptable model of care. Benefits included empowerment, school cohesion and potential improvement in health literacy, with no major issues perceived.	-
Newman, L.	Service Providers' Experiences of Using a Telehealth Network 12 Months After Digitization of a Large Australian Rural Mental Health Service	Original Research	International	The intent of this article is to study service providers' experiences of an existing regional telehealth network for mental health care practice twelve months after digitization in order to identify the benefits of digital telehealth over an analog system for mental health care purposes in rural Australia.	The digitized telehealth network was generally well received by providers and adopted into clinical practice. Compared with the previous analog system, staff found advantages in better visual and audio quality, more technical stability with less "drop-out", less time delay to conversations and less confusion for clients. Despite these advantages, providers identified a range of challenges to starting or continuing use and they recommended	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
					improvements to increase uptake among mental health service providers and other providers, and to clinical uses other than mental health. To further increase uptake and impact of telehealth-mediated mental health care in rural and remote areas, even with a high-quality digital system.	
Moody, L. N.	Substance Use in Rural Central Appalachia: Current Status and Treatment Considerations	Perspective	State	Current policies and interventions for substance use have been largely inadequate in the region, as evidenced by continued increases in substance use and substance-related deaths, especially related to nonmedical prescription drug use and increasing heroin use.	The authors discuss ways in which rural life, poverty, identity, and values in Appalachia have influenced substance use and treatment and propose strategies and interventions to improve outcomes.	-
Schlachta-Fairchild, L.	Telehealth and Telenursing Are Live: APN Policy and Practice Implications	Perspective	National	Three major studies in recent years have examined APNs and telenursing. These studies will be described in further detail to provide a context for current and future APN telenursing policy and practice.	Key issues such as technology selection and implementation principles, interstate licensure, malpractice, and telehealth reimbursement are important to further advancing telenursing.	-

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Chen, P.	Telehealth Attitudes and Use Among Medical Professionals, Medical Students and Patients in China - A Cross-Sectional Survey	Original Research	International	The goal of this paper was to determine attitudes and use of telehealth in China among medical professionals and patients, as well as identify factors that may affect its use.	Medical professionals and patients alike in China have a high awareness of telehealth, primarily traditional forms of telehealth, but only a small percentage actually use it. Patients have much lower awareness and use of telehealth than medical professionals and medical students, though they have generally positive attitudes towards telehealth.	-
Prendergast, M.	The Barriers and Facilitators for Nurse Educators Using Telehealth for Education	Original Research	International	This study describes nurse educators use of telehealth for education and identifies barriers and facilitators to increase the uptake of telehealth amongst nurse educators.	Equipment that was not user friendly and a lack of initial training were recognized as barriers to their uptake of telehealth. Telehealth training and support, and local champions were identified facilitators to increase the uptake of telehealth. Recommendations include the need for early adopting nurse educators to be recognized and encouraged, to role model good practice in telehealth, and mentor and support others.	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Burmeister, O. K	The Impact of Telehealth Technology on User Perception of Wellbeing and Social Functioning, and the Implications for Service Providers	Original Research	Health System	The aim of the project was to evaluate the use of telehealth equipment in the homes of older community-dwelling people, and to review its social and economic impact.	Overall, the greatest benefit was apparent in those participants with a low familiarity with technology and low digital literacy, where changes in behaviors to prevent an exacerbation of their condition was possible. The user interface design reduced concern about using the technology. Changes achieved were through better compliance with medication and associated understanding of the impact on their vital signs and hence daily activities.	No difference
Schwalb, P.	The Role of Contradictions and Norms in the Design and Use of Telemedicine - Healthcare Professionals' Perspective	Original Research	International	The authors apply a socio-technical approach and, specifically, activity theory to study how healthcare professionals in Sri Lanka adopted and used telemedicine.	Based on their work, they recommend that telemedicine application designers need to consider: 1) subjects' (a la activity theory) motivations to engage in the activity that telemedicine mediates, 2) the norms and rules that mediate the activity, 3) contradictions in the existing activity system, and 4) the application's technological characteristics.	No difference

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Larsen, S. B.	Towards a Shared Service Centre for Telemedicine - Telemedicine in Denmark, and a Possible Way Forward	Perspective	International	This article presents results from a multi-stakeholder project that developed a new concept, a 'shared service center' for telemedicine that is envisioned as working across different telemedical initiatives to support the implementation and wider adoption of telemedicine.	Most of the ideas generated for potential center support for telemedicine could be categorized under four service categories. The need for such support services was verified in the cases investigated, and by agreement among stakeholders from regional health authorities, municipalities, and general practice.	No difference
Rho, M. J.	Users' Perception on Telemedicine Service - a Comparative Study of Public Healthcare and Private Healthcare	Original Research	International	The purpose of this study was to examine the perceptions of telemedicine services between public healthcare users and private healthcare users.	Private healthcare users expressed greater satisfaction with telemedicine services than did public healthcare users, whereas private healthcare users felt less worry about perceived risk. Both groups perceived that telemedicine was useful and easy to use for healthcare service, expressing higher intentions to use. In both groups, perceived usefulness and ease of use had positive effects on continuous intention to use. In public healthcare users only, satisfaction was found to be an important variable that increased intention to use. Perceived risk had no	Marginal

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Allaert, F. A.	Will Applications on Smartphones Allow a Generalization of Telemedicine?	Perspective	International	Why telemedicine has failed for years to take off in many European healthcare system despite a real need.	relationship with continuous intention to use in either group. Authors discuss how the development of smartphones and their current widespread use should allow the generalization of telemedicine in France and on a global scale.	No difference

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Reimbursement Literature Table

Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Tracy, J.	Critical Steps to Scaling Telehealth for National Reform	Original Research	National	To outline how limited reimbursement and various legal and regulatory barriers have slowed the growth of telemedicine and its adoption across the county.	Important aspects of telehealth services include access to care, patient safety, quality, addressing provider shortfalls and reimbursement.	Moderate
Turer, R.	Electronic Personal Protective Equipment: A Strategy to Protect Emergency Department Providers in the Age of COVID-19	Literature Review	National	To demonstrate how technology-bases solutions can provide medical services while combating COVID-19.	While still satisfying requirements of the Emergency Medical Treatment and Active Labor Act (EMTALA), technology can serve as electronic personal protective equipment and help providers maintain safe standards in medical screenings. Reimbursement is available under the CMS emergency period.	-
Britton, J.	Healthcare Reimbursement and Quality Improvement: Integration Using the Electronic Medical Record	Perspective	National	To examine the current state of payment methodologies used in the United States to compensate providers for rendering medical services.	Continued use of technology, to include electronic medical records, will be able to assist in providing timely, accurate, and fair compensation based upon patient treatment and clinical outcomes.	-

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Schwartz, J.	Pocketful of Justice: Will Digital Medicine be Available to the Poor?	Original Research	National	To examine how certain aspects of telehealth, to include drugs with ingestion censors, are not available to all consumers.	As reimbursement is lagging in aspects for telehealth, certain specialties and new technologies are out of reach for patients in poverty-related conditions.	Moderate
Whitten, P.	Private Payer Reimbursement for Telemedicine Services in The United States	Original Research	National	To capture a current picture of private reimbursement of telemedicine in the United States.	Up to 58% of organizations that responded to a nationwide survey indicate allowing billable telemedicine services. Additionally, a majority (81%) of respondents reported no difference in claims processing for medical services when submitted for a telemedicine modality as opposed to an in-person modality.	No difference
Antoniotti, N.	Private Payer Telehealth Reimbursement in the United States	Original Research	National	To investigate experiences of providers on reimbursement for telehealth from private payers.	Compared to earlier surveys, growth in reimbursement from telehealth has been slow. Government payers and some large, private payers are highly influential in policy adoption as it relates to reimbursement for telehealth throughout the Untied States.	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Pong, R.	Reimbursing Physicians for Telehealth Practices: Issues and Policy Options	National / International	Original Research	To review the extent of reimbursement practices for telehealth in both Canada and the United States. Pros and cons of several payment options are analyzed.	Differences in payment for telehealth services are evident between public and private payers in the United States. The lack of widespread adoption can be attributed to many reasons, but such reason is lack of robust and consistent reimbursement.	Marginal
Brown, N.	State Medicaid and Private Payer Reimbursement for Telemedicine: An Overview	Original Research	National	To explore the advancement of telehealth and reimbursement to providers since the onset of its offering back in 1998.	Consistent reimbursement across the states is an inhibiting factoring to fueling the growth of telemedicine.	Moderate
Gray, G.	Study of Participating and Nonparticipating States' Telemedicine Medicaid Reimbursement Status: Its Impact on Idaho's Policymaking Process	Original Research	State	To establish protocols for Idaho's use of telemedicine, a national electronic policy survey was conducted to evaluate the direction of telemedicine policy in state Medicaid agencies.	States not participating in Medicaid reimbursement using telemedicine responded with high interest for developing relationships that facilitate the future of telemedicine reimbursement. Cost-benefit analyses were also identified as a necessary component to help facilitate the viability of telemedicine in Medicaid states.	No difference
Adler-Milstein, J.	Telehealth Among US Hospitals: Several Factors, Including State Reimbursement and Licensure Policies, Influence Adoption	Original Research	National	To examine factors associated with telehealth adoption in hospital systems.	Hospital telehealth adoption are largely impacted by state-level policies. Policies that promote private payer	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
					reimbursement for telehealth are associated with a greater likelihood of telehealth adoption.	
Yang, T.	Telehealth Parity Laws	Original Research	National	To provide an update on laws and regulations for reimbursement as it relates to telehealth for Medicare beneficiaries.	During the emergency period associated with the novel coronavirus, some restrictions have been limited on both destination and originating sites to render telehealth services.	-
Whitten, P.	Telemedicine from the Payor Perspective	National / International	Original Research	To examine the extent to which reimbursement has impacted the movement of telehealth from the demonstration stage to a mainstream component of the healthcare system.	Conclusive evidence as to the clinical- or cost-effectiveness of telemedicine does not exist as it relates to supporting generalizations of telemedicine. The lack of any consistent generalization impacts funding and reimbursement for telemedicine services	Moderate
Devore, P.	The Slow Pace of Interactive Video Telemedicine Adoption: The Perspective of Telemedicine Program Administrators on Physician Participation	Original Research	National	To interview program administrators on issues facing telemedicine adoption.	Reimbursement issues are one of the key limiting factors in further telemedicine adoption. Advancement in the adoption of telemedicine has been evidenced in specialty care, but not as much growth has been seen in primary care.	Moderate

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Lead Author	Article Title	Article Type	Setting	Purpose	Outcome	Magnitude of Difference
Mehrotra, A.	Utilization of Telemedicine Among Rural Medicare Beneficiaries	Original Research	National	To compare states with and without parity for telemedicine services as it relates to utilization and growth.	Telemedicine utilization was higher in states with telemedicine parity laws, although the growth in telemedicine utilization between states that did and did not have parity laws was not statistically significant. Reimbursement was a limiting factor in faster grown of Medicare beneficiaries and telemedicine.	Moderate

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