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TELEMEDICINE REIMBURSEMENT: RAISING THE IRON TRIANGLE TO A NEW PLATEAU

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I. INTRODUCTION

[†] B.A. University of Pennsylvania; J.D. The University of Chicago Law School. Many thanks to Lisa Bernstein, Philip Hamburger, Alan Sykes, Max Mehlman, David Hyman and the members of the Legal Scholarship Workshop at The University of Chicago Law School for all of their helpful comments. The reader should be aware that the information contained in this paper is current as of November 2002. As telemedicine is a rapidly expanding field, there have been changes in the regulatory scheme since this time. Where possible, the author has noted these changes throughout the paper.

Traditionally, telemedicine¹ has not been reimbursed in the United States because there is a lack of data that adequately addresses the cost, quality and access of telemedicine.² As a result, insurers worry about duplicative reimbursement raising costs, the quality of the health care provided, and the possibility of stimulating an inappropriate demand for telemedicine services. The use of advanced telemedicine technologies, therefore, has been restricted even in situations where telemedicine consultations could prove advantageous to the patient. The 1997 Telemedicine Report to Congress recognized the concerns about the efficacy, cost, and medical necessity of

¹ Telemedicine has been defined as “the use of electronic communication and information technologies to provide or support clinical care at a distance.” DEP’T. OF COMMERCE, TELEMED. REPORT TO THE CONG., 1 (1997). However, the 2001 Report to Congress used the term “telehealth” and defined it as “the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health and health administration. OFFICE FOR THE ADVANCEMENT OF TELEHEALTH, DEPARTMENT OF HUMAN SERVICES, 2001 TELEMEDICINE REPORT TO CONGRESS 1 (January 2001) at <http://telehealth.hrsa.gov/pubs/report2001/2001repo.pdf> [hereinafter 2001 REPORT]. Telemedicine has also been defined in numerous other ways. See, e.g., Julie M. Kearney, *Telemedicine: Ringing in a New Era of Health Care Delivery*, 5 COMM’LAW CONSP’CTUS 289, 290-91 (1997) (providing a workable definition of telemedicine); CENTERS FOR DEVICES AND RADIOLOGICAL HEALTH, FOOD AND DRUG ADMIN., TELEMEDICINE RELATED ACTIVITIES (1996) available at <http://www.fda.gov/cdrh/telem.html> (July 11, 1996) (stating the FDA’s definition of telemedicine as the “application of telecommunications to the core of individual patients”). For the purposes of this paper, telemedicine is the practice of medicine that is normally reimbursable using electronic means. For instance, a phone consultation about X-rays or a complex robotic surgery qualifies as telemedicine as insurance carriers typically reimburse physicians for their traditional equivalents, a face-to-face consultation or performance of surgery in person. It is important to note that telemedicine is distinct from cybermedicine. Cybermedicine is “the Internet driven practice of medicine where patients communicate with physicians (cyberdoctors) through electronic mail, and then the cyberdoctors diagnose the patient’s ailments.” Ranney V. Wiesemann, *On-Line or On-Call? Legal and Ethical Challenges Emerging in Cybermedicine*, 43 St. Louis U.L.J. 1119, 1119 (1999). Wiesemann distinguishes telemedicine and cybermedicine as follows: “Telemedicine is the reality of known physicians communicating with other physicians for the benefit of the patient, while cybermedicine entails unknown physicians setting up sites on the Worldwide Web to diagnose unknown patients.” *Id.* at 1143. This paper adopts this distinction.

² Medicare, Medicaid, and private insurance companies often have refused to reimburse patients for the costs of physician services used via electronic means. DEPARTMENT OF HEALTH AND HUMAN SERVICES, HEALTH RESOURCES AND SERVICES ADMIN., 2001 REPORT TO CONGRESS ON TELEMEDICINE: PAYMENT ISSUES (2001) available at <http://telehealth.hrsa.gov/pubs/report2001/pay.htm> (last updated May 20, 2002). This policy is due to a lack of telemedicine data that either supports or discourages telemedicine reimbursement expansion. See 2001 REPORT, *supra* note 1, at 3 (providing a historical perspective of telemedicine reimbursement).

telemedicine services and called for a series of studies to be done on the ramifications of telemedicine.³ Within the past several years, the responses to this call for research have emerged. However, the 2001 Telemedicine Report to Congress still lists “lack of reimbursement” as a critical barrier to the expansion of telemedicine.⁴ On October 1, 2001, Medicare coverage for “telehealth”⁵ services was expanded under the Medicare, Medicaid and SCHIP Benefits Improvement Protection Act of 2000 (BIPA). This act, however, does not extend to all reasonable uses of telemedicine, and it does not affect private insurers. This paper suggests that while some important data on telemedicine is missing, there is enough data to support broadening telemedicine reimbursement because of telemedicine’s positive effects on the cost, quality, and access to health care. Perhaps private and public insurers have been reluctant to reimburse telemedicine not only because of a lack of data, but because of a fear of moral hazard concerns, the possibility of irrational decision-makers, fear of new technology in the medical field, and first-mover problems.

While many in the legal field have written about the tort liability⁶ and licensure⁷ of physicians practicing telemedicine, very little has been written on telemedicine reimbursement. This paper seeks to fill that gap by analyzing the effects of telemedicine on the cost, quality, and access to health care and on the structure of the American health

³ DEP’T. OF COMMERCE, TELEMED. REPORT TO THE CONG. at 59-61.

⁴ 2001 REPORT, *supra* note 1.

⁵ DHHS began using the term telehealth instead of telemedicine because it is, in their eyes, a broader concept. DHHS defines telehealth as “the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, and public health and health administration.” *Id.* For the purposes of this paper telehealth and telemedicine are interchangeable.

⁶ See, e.g., Kip Poc, *Telemedicine Liability: Texas and Other States Delve into the Uncertainties of Health Care Delivery Via Advanced Communications Technology*, 20 REV. LITIG. 681 (2001) (discussing tort liability for telemedicine in Texas); Jeffery L. Rensberger, *Choice of Law, Medical Malpractice, and Telemedicine: The Present Diagnosis with a Prescription for the Future*, 55 U. MIAMI L. REV. 31 (2000) (discussing law applied in interstate medical malpractice cases); Patricia C. Kuszler, *Telemedicine and Integrated Health Care Delivery: Compounding Malpractice Liability*, 25 AM. J.L. & MED. 297 (1999) (discussing medical malpractice liability in telemedicine and integrated health care delivery).

⁷ See Ross D. Silverman, *Regulating Medical Practice in the Cyber Age: Issues and Challenges for State Medical Boards*, 26 AM. J.L. & MED. 255 (2000) (discussing how medical boards are overseeing the practice of medicine in light of internet advancements). See, e.g., Erin K. Grunzke, *Long-Distance Doctors: The Crossroads of Telemedicine Licensure in Illinois*, 89 ILL. B.J. 362 (2001) (suggesting licensure standards in Illinois dealing with telemedicine).

care system in light of the new empirical studies.⁸ First, the paper briefly looks at the history of telemedicine reimbursement, reviews the current statutory and regulatory regime for Medicare and Medicaid reimbursement of telehealth services, and examines current reimbursement trends in the private sector. Second, the paper analyzes the effect of telemedicine on the cost, quality and access to health care in light of current reimbursement standards. The analysis suggests that new technologies may be able to relax the constraints of the iron triangle of health care and successfully raise it to a new plateau. Finally, the paper hypothesizes about the effects of telemedicine on the structure of health care provision in the United States, examines who should be making telemedicine reimbursement policy, and recommends changes in current reimbursement law and practice that more closely conform to the available empirical studies.

II. TELEMEDICINE REIMBURSEMENT SCHEMES

Traditionally, the three major health care insurers, Medicare, Medicaid, and private insurers, have not reimbursed providers for most telemedicine services. Recently, however, insurers have begun to reimburse for some telemedicine services under limited circumstances. This section of the paper explores briefly both the history of telemedicine reimbursement for each insurer and describes each insurer's current telemedicine reimbursement policy in an attempt to show the limitations of telemedicine reimbursement and point out the gaps in coverage.

⁸ Other possible telemedicine topics that deserve more exploration in the legal literature are telemedicine and privacy and telemedicine's effect on the way that health care is provided, in particular how changes in health care provision interact with organizational changes created by the legal system.

A. Medicare⁹

While Medicare historically reimbursed for some services that did not require face-to-face interaction between a patient and a physician, such as the interpretation of an EKG,¹⁰ Medicare did not have a formal telemedicine reimbursement policy until recently. As of January 1, 1999 the Balanced Budget Act of 1997 (BBA) requires that the Health Care Finance Administration (HCFA)¹¹ reimburse certain telemedicine services.¹² Between January 1, 1999 and September 30, 2000, Medicare reimbursed 301 teleconsultation claims with a total value of \$20,000.¹³ The low number of reimbursements was in part due to limitations such as fee sharing,¹⁴ presenter requirements,¹⁵

⁹ Medicare is part of the Social Security system and provides medical care coverage for most persons sixty-five and older, some people under sixty-five who meet certain requirements, and persons who have end stage renal disease. 42 U.S.C. § 1395c (2000). Medicare is divided into two parts, Part A and Part B. Part A is hospital insurance that helps pay for inpatient care at hospitals and care in critical access hospitals, skilled nursing facilities, hospice care and some home health care. Centers for Medicare & Medicaid Servs., *Medicare Eligibility, Enrollment, and Premiums*, at <http://www.medicare.gov/Basics/WhatIs.asp> (last visited March 1, 2003). Most people do not have to pay a premium for Part A benefits upon turning sixty-five because either they or a spouse paid Medicare taxes while working. *Id.* Part B is medical insurance that helps pay for “[d]octors, services, outpatient hospital care, and some other services that Part A does not cover” if they are medically necessary. *Id.* Enrolling in Medicare Part B is voluntary and requires a payment of a premium that varies depending upon when one chooses to join Part B. Usually this premium is taken out of a patient’s “Social Security, Railroad Retirement, or Civil Service Retirement check.” The 2002 monthly premium for those who chose to begin paying Medicare Part B premiums shortly after their sixty-fifth birthday was \$54.00. For those who choose to delay participation in Medicare Part B until later in life the premium price is higher when they join. *Id.*

¹⁰ Reimbursement for these services depended upon the local medical review policies (LMRPs) of the regional Medicare carriers and varied from region to region. DEPARTMENT OF HEALTH AND HUMAN SERVICES, HEALTH RESOURCES AND SERVICES ADMIN., *supra* note 2.

¹¹ The Health Care Finance Administration (HCFA) is now called the Centers for Medicare & Medicaid Services (CMS).

¹² Balanced Budget Act of 1997, Pub. L. No. 105-33, § 4206(a), 111 Stat. 251, 377-79 (1997).

¹³ Office for the Advancement of Telehealth, *Telehealth Update*, at <http://telehealth.hrsa.gov/pubs.htm> (Apr., 2001).

¹⁴ “The payment shall be shared between the referring physician or practitioner and the consulting physician or practitioner. The amount of such payment shall not be greater than the current fee schedule of the consulting physician or practitioner for the health care services provided.” § 4206(b)(1), 111 Stat. at 378.

¹⁵ In order to be reimbursed for a telemedicine service an “eligible presenter” at the originating site had to present the patient to the remote physician. Although registered nurses, licensed practical nurses and health care professionals are the most common presenters in a telemedicine setting, they were not considered to be eligible

geographic restrictions,¹⁶ and the low number of eligible services.¹⁷ In December 2000, Congress passed the Medicare, Medicaid and SCHIP Benefits Improvement and Protection Act of 2000 (BIPA) to address many of limitations of the Balanced Budget Act's reimbursement scheme.¹⁸ While BIPA eliminates the presenter requirement, establishes a facility fee for the originating site, requires reimbursement of the remote physician's services comparable to that for real-life consultations, eliminates fee splitting, expands the number of eligible geographic locations, and expands the number of eligible telehealth services, it did not become effective until October 1, 2001.¹⁹

After BIPA's effective date of October 1, 2001, the Centers for Medicare & Medicaid Services (CMS), published some regulations to clarify its position with regards to BIPA's language.²⁰ Section 410.78 of the Code of Federal Regulations states Medicare Part B's current reimbursement policy for telehealth services.²¹ Under the current regulations interpreting BIPA, Medicare Part B will pay for "office and other outpatient visits, professional consultation, psychiatric diagnostic interview examination, individual psychotherapy, and pharmacologic management furnished by an interactive telecommunications system."²² In order to qualify as an interactive

presenters. The presenter had to be a "physician or practitioner." See 2001 REPORT *supra* note 1, at 2 (listing telemedicine reimbursement requirements).

¹⁶ The patient was required to reside in a county designated as a Rural Health Professional Shortage Area (HPSA). § 4206(a), 111 Stat. at 377-78.

¹⁷ For a list of eligible services see 2001 REPORT *supra* note 1, at 2.

¹⁸ Office of the Advancement of Telehealth, *supra* note 13.

¹⁹ *Id.*; Robert J. Waters, *Telehealth Provisions*, The Center for Telemedicine Law, at http://www.arentfox.com/quickGuide/businessLines/telemed/e-health_telemed/e-healthNewsAlerts/telehealthprovisions/telehealthprovisions.html (last visited Feb. 25, 2003).

²⁰ Medicare Program, Revisions to Payment Policies and Five-Year Review of and Adjustments to the Relative Value Units Under the Physician Fee Schedule for Calendar Year 2002, 66 FED. REG. 55281-55284 (Nov. 1, 2001) (to be codified at 42 C.F.R. pts. 405, 410, 411, 414, and 415).

²¹ 42 C.F.R. § 410.78 (2003).

²² *Id.* § 410.78(b). One exception to the interactive telecommunications system requirement allows reimbursement for asynchronous store and forward technologies, in single or multimedia formats, used in Federal telemedicine demonstration programs conducted in Alaska or Hawaii. *Id.* § 410.78(d). "Asynchronous store and forward technologies means the transmission of a patient's medical information from an originating site to the physician or practitioner at the distant site. . . . An asynchronous telecommunications system in single media format does not include telephone calls, images transmitted via facsimile machines and text messages without visualization of the patient (electronic mail). Photographs visualized by a telecommunications system must be specific to the patient's medical condition and adequate for furnishing or confirming a diagnosis and or treatment plan. Dermatological photographs, for example, a photograph of a skin lesion, may

telecommunications system, there must be audio and video equipment that permits “two-way, real-time interactive communication between the patient and the distant site physician or practitioner.”²³ “Telephones, facsimile machines, and electronic mail systems do not meet the definition of an interactive telecommunications system.”²⁴ In addition, the originating site, the site where the patient is located, must be the office of a physician or practitioner, a critical access hospital, a rural health clinic, a federally qualified health center, or a hospital.²⁵ Geographically, reimbursement is limited to originating sites located in either a Rural Health Professional Shortage Area

be considered to meet the requirement of a single media format under this provision.” *Id.* § 410.78(a)(1).

²³ A practitioner is described as a physician, physician assistant, nurse practitioner, clinical nurse specialist, nurse-midwife, clinical psychologist, or clinical social worker. *Id.* § 410.78(b)(2). In addition, the “physician or practitioner at the distant site must be licensed to furnish the service under State law.” *Id.* § 410.78(b)(1). This requirement forces states to consider, and perhaps actively participate in, the current licensure debate surrounding telemedicine. As the regulations do not specify under which state law the physician or practitioner must be licensed, reimbursement in many cases will depend heavily on state licensure law. For instance, must the remote physician be licensed to practice medicine in the state where *they* are located or in the state where *the patient* is located? The Medicare regulations leave these issues to be debated between state legislators. For more on this debate see Silverman, *supra* note 7.

²⁴ 42 C.F.R. § 410.78(a)(3). The reasoning for this restriction is not clear. BIPA does not require the restriction. However, the restriction appears in early Program Memoranda to intermediaries/carriers that contain policy and billing instructions under current law. Program Memorandum from the Dep’t. of Health and Human Services, Health Financing Administration (Jan. 2000), *available at* http://cms.khs.gov/manuals/pm_trans/B000260.pdf. These memoranda suggest that fear of fraud may be one reason for this restriction. For instance, one Program Memorandum states that the “patient must be present and participating in the telehealth visit” as a condition of payment, that telephone calls, faxes and e-mails are not reimbursed “without visualization of the patient,” and that photographs “must be specific to the patients’ condition and adequate for rendering or confirming a diagnosis and or treatment plan.” *Id.*

²⁵ 42 C.F.R. § 410.78(b)(3).

(HPSA),²⁶ non-Metropolitan Statistical Area (non-MSA),²⁷ or a site that is part of a Federal telemedicine demonstration project.²⁸

While Medicare probably has the most comprehensive telemedicine reimbursement policy to date, there are still some serious gaps in telemedicine coverage. For instance, geographical limits mean that a person in a MSA cannot be reimbursed for telemedicine services even though the need for those services and the efficacy of those services may match or exceed the need and efficacy of the services for a patient within the geographically covered area. Part III of this paper suggests that the current geographical restrictions are not a logical way to decide reimbursement issues because the empirical studies suggest some efficacy across broader geographical locales. In addition, Medicare does not generally reimburse for certain types of telemedicine services such as the use of store and forward technology, which have been shown to be highly effective in empirical studies.²⁹ This paper questions why Medicare would favor complex interactive video-consults over simple, cost-effective measures such as e-mail, telephone and fax.³⁰

B. Medicaid Reimbursement

Medicaid is a federal program that provides medical care to low-income, needy or disabled members of society.³¹ Each state runs its own Medicaid program within the boundaries set by the federal government.³² Therefore, each state has different reimbursement

²⁶ A listing of HPSAs can be found at <http://bphc.hrsa.gov/databases/newhpsa/newhpsa.cfm> (last visited Dec. 25, 2001).

²⁷ The Office of Management and Budget (OMB) defines metropolitan areas, which comprise metropolitan statistical areas, via the standards published in the Revised Standards for Defining Metropolitan Areas in the 1990's, 55 FED. REG. 12154-12160 (Mar. 30, 1990). A listing of metropolitan areas, consolidated metropolitan statistical areas, and primary metropolitan statistical areas is available at <http://www.whitehouse.gov/omb/bulletins/95-04attachintro.html> (last visited Mar. 4, 2002).

²⁸ 42 C.F.R. § 410.78(b)(4).

²⁹ Store and forward technology generally refers to the capture of an electronic image such as an X-ray or CT-scan that is then forwarded via electronic mail to a remote physician for consultation.

³⁰ See *infra* note 23.

³¹ "Medicaid is a jointly-funded, Federal-State health insurance program . . . It covers approximately 36 million individuals including children, the aged, blind, and/or disabled." CENTERS FOR MEDICARE & MEDICAID SERVICES, MEDICAID INFORMATION, at <http://www.hcta.gov/medicaid/medicaid.htm> (last modified Sept. 27, 2002).

³² States have some discretion as to which groups their Medicaid programs will cover and the financial eligibility requirements. However, there are some

policies that are developed according to state law and state agency regulations. As a result, Medicaid reimbursement for telemedicine services is available if and to the extent that the state chooses.³³

Currently, twenty states allow Medicaid reimbursement for some services.³⁴ However, there are some limitations on reimbursement. For instance, Federal Medicaid guidelines require that providers practice within the scope of their state practice act to be eligible for Medicaid reimbursement.³⁵ If state law requires licensure in the state where the patient is located, then the provider may not be eligible for reimbursement of services rendered out of state via telemedicine.³⁶ In fact, the provider might be violating state law by practicing medicine outside the state's Scope of Practice Act. Also, the federal government requires that all Medicaid-covered services, including those involving telemedicine, be medically necessary and meet the federal requirements of efficiency, economy, and quality of care.³⁷ Medicaid encourages states to create "innovate payment methodologies for service[s] that incorporate telemedicine technology" with these requirements in mind.³⁸ Therefore, Medicaid reimbursement standards and availability of each individual telemedicine service vary from state to state making it difficult for practitioners and patients to know whether or not their claims will be reimbursed. The patchwork coverage that results may allow reimbursement of services for a patient in a non-MSA, but not allow reimbursement for the same service minutes away in a large city.³⁹ Such a result makes telemedicine reimbursement decisions seem random and unfair.

mandatory Medicaid eligibility groups such as low-income families with children. CENTERS FOR MEDICARE & MEDICAID SERVICES, MEDICAID ELIGIBILITY, at <http://cms.hhs.gov/medicaid/eligibility/criteria.asp> (last modified May 23, 2002).

³³ Centers for Medicare & Medicaid Services, *Medicaid and Telemedicine*, at <http://cms.hhs.gov/states/telemed.asp> (last modified June 5, 2002).

³⁴ These states include Arkansas, California, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Montana, Nebraska, North Carolina, North Dakota, Oklahoma, South Dakota, Texas, Utah, Virginia, and West Virginia. In addition, Connecticut, Maine and Minnesota are piloting telemedicine programs. 2001 REPORT, *supra* note 1, at 3, 4. A partial list detailing state coverage is available at CENTERS FOR MEDICARE & MEDICAID SERVICES, STATES WHERE MEDICAID REIMBURSEMENT OF SERVICES UTILIZING TELEMEDICINE IS AVAILABLE, at <http://cms.hhs.gov/states/telelist.asp> (last modified June 5, 2002).

³⁵ For instance, the law requires that services paid for by Medicaid must be rendered by the appropriate physician or practitioner. 42 C.F.R. § 440.50 (2002); 42 C.F.R. § 440.60 (2002).

³⁶ Centers for Medicare & Medicaid Services, *supra* note 33.

³⁷ 42 C.F.R. § 447.200 (2002).

³⁸ Centers for Medicare & Medicaid Services, *supra* note 33.

³⁹ Of course, patchwork coverage of a particular medical service is not

C. Private Reimbursement

Determining the level of private insurer reimbursement for telemedicine is very difficult due to a lack of available data. Where available, however, the data shows that private insurers are beginning to cover more telemedicine services, perhaps in response to increased Medicare coverage. This change in policy is voluntary in some instances, but in other instances it is the result of state statutes that require private insurers in that state to cover telemedicine under certain circumstances.

Private health insurance is generally made available to employees and their families through the employee's employer, COBRA,⁴⁰ or a commercially advertised plan. Telemedicine reimbursement policies of private health insurers are unique to each insurer. Private insurers have rarely reimbursed telemedicine services such as telemedicine consultations.⁴¹ However, in recent years, some private insurers have provided limited telemedicine coverage.⁴²

Whether or not a private insurer reimburses a medical provider for telemedicine services is generally within the control of the private insurer. Unfortunately, it is very difficult to obtain information concerning the telemedicine reimbursement policies of many private insurers. However, the Office for the Advancement of Telehealth (OAT) is currently in the process of conducting a national study of private third party payments for telemedicine.⁴³ The preliminary results, received via OAT telemedicine project grantees, suggest that private third-party telemedicine coverage is broader than suspected.⁴⁴

unique to telemedicine, and opinions may vary on whether or not patchwork coverage is a good thing. On one hand it allows for experimentation on the local level, but on the other hand it results in unequal coverage that appears unfair. This paper does not participate in this debate, but simply notes that patchwork coverage can be arguably problematic in health care.

⁴⁰ COBRA stands for the Consolidated Omnibus Budget Reconciliation Act of 1985. COBRA is a federal law that requires all employer-sponsored health plans to allow certain employees and their families the opportunity to continue health insurance at their own expense under the group plan after their insurance coverage would normally have ceased due to death of the qualifying employee, divorce, or some other qualifying event. JONAS AND KOVNER'S HEALTH CARE DELIVERY IN THE UNITED STATES 529 (Anthony R. Kovner & Steven Jones eds., 1999).

⁴¹ DEP'T. OF COMMERCE, TELEMED. REPORT TO THE CONG. at 51.

⁴² See 2001 REPORT, *supra* note 1, at 4 (listing several providers who offer limited coverage).

⁴³ Dena S. Pushkin, *Telemedicine: Follow the Money*, 6 ONLINE J. OF ISSUES IN NURSING (Sept. 30, 2001) at http://www.nursingworld.org/ojin/topic16/tpc_1.htm.

⁴⁴ "For example, as of January 2001, Blue Cross/Blue Shield provided at least some telemedicine coverage in 11 of the states in which OAT has grantees: California, Georgia, Kentucky, Maine, Missouri, Montana, Nebraska, North Dakota,

However, the percentage of private insurer reimbursements for telemedicine services is likely to be lower than reimbursements for traditional services.

But, this may change in the future. If Medicare begins reimbursing more telemedicine services, it is likely that both Medicaid and private insurers will do so.⁴⁵ This trend is already apparent in telemedicine reimbursement. For instance, while Blue Cross and Blue Shield of Texas does cover some telemedicine services, they do not cover “telemedicine services billed for the use of a telephone or fax machine.”⁴⁶ This mimics Medicare’s reimbursement policy, which reimburses telemedicine services, excluding fax and phone.

Sometimes, private insurers are subjected to state laws that require third party payers to reimburse telemedicine services for any policy issued, offered, or renewed in the state. To date, six states require some form of telemedicine reimbursement.⁴⁷ For instance, in Colorado no “health benefit plan”⁴⁸ that is “issued, amended, or renewed for a person residing in a county with one hundred fifty thousand or fewer residents may require face-to-face contact between

Oklahoma, Tennessee, and Wisconsin. Blue Cross of California is going a step further to build a statewide telemedicine network to serve medically underserved populations.” *Id.*

⁴⁵ Medicaid and private insurers often follow the lead of Medicare in making reimbursement decisions, and to a lesser extent, in making quality of care decisions. This may be due to the massive amounts of federal funding dedicated to health services research. Eleanor D. Kinney, *Behind the Veil Where the Action is: Private Policy Making and American Health Care*, 51 ADMIN. L. REV. 145, 176 (1999). See SCIENCE PANEL OF INTERACTIVE COMMUNICATION AND HEALTH, U.S. DEP’T OF HEALTH AND HUMAN SERVICES., WIRED FOR HEALTH AND WELL-BEING: THE EMERGENCE OF INTERACTIVE HEALTH COMMUNICATION 90 (Thomas R. Eng & David H. Gustafson eds., 1999) for the viewpoint that private insurers are likely to follow Medicare’s lead in telemedicine reimbursement. Also, see *infra* pages 51-52 for further discussion of this point.

⁴⁶ Blue Cross Blue Shield of Texas, *What’s Not Covered* (visited Dec. 25, 2001) <http://www.bcbstx.com/hsp2002/notcovered.htm>. This coverage policy became effective January 2002 and mimics federal telemedicine coverage decisions that became effective in November of 2001. The timing suggests that Blue Cross Blue Shield of Texas voluntarily changed their coverage policies to mimic federal coverage policy.

⁴⁷ California, Colorado, Hawaii, Kentucky, Louisiana and Texas. Note that California only requires telemedicine reimbursement under disability insurance contracts. CA. INS. CODE § 10123.85 (2003). There does not seem to be a corollary statute for medical insurance in California.

⁴⁸ A “health benefit plan” is defined as any hospital or medical expense policy or certificate, hospital or medical service corporation contract, or health maintenance organization subscriber contract or any other similar health contract subject to the jurisdiction of the commission available for use, offered, or sold in Colorado.” COLO. REV. STAT. § 10-16-102(21)(a) (2002).

a provider and a covered person for services appropriately provided through telemedicine.”⁴⁹ However, there are several exceptions to this requirement that severely limit the effect of the statute. First, the carrier can require “fact-to-face contact” if there is not a participating provider that is within both the carrier’s network and the member’s geographic area.⁵⁰ Second, “face-to-face contact” may be required if the county in which the covered person resides lacks the necessary telemedicine technology.⁵¹ These exceptions, therefore, seem to make the rule requiring telemedicine reimbursement by private insurers a fallacy.⁵²

While Colorado’s statute has geographic restrictions, the other five states that have laws requiring third party telemedicine reimbursement do not have geographic limitations.⁵³ In Hawaii, no health maintenance organization plan,⁵⁴ mutual benefit society plan,⁵⁵ or accident and sickness insurance plan⁵⁶ that is “issued, amended, or renewed shall require face-to-face contact between a health care provider and a patient as a prerequisite for payment for services appropriately provided through telemedicine.”⁵⁷ Louisiana⁵⁸ and

⁴⁹ COLO. REV. STAT. § 10-16-123(2) (2002).

⁵⁰ The geographic area is defined as “the entire state of Colorado or, for plans that do not cover the entire state, any county within which the carrier is authorized to have arrangements established with providers.” *Id.* Therefore, insurance companies can easily avoid the telemedicine reimbursement requirement if they contract with one physician to provide services within the defined geographic area. If the plan covers the entire state, patients may still be required to travel long distances to seek medical care.

⁵¹ *Id.* While this exception makes practical sense, it also begs the question of how many qualifying geographic areas have the necessary technology to provide telemedicine services.

⁵² In fact, I was unable to find evidence that any private insurer in Colorado covers telemedicine services. The preliminary OAT study, while admittedly incomplete, fails to list Colorado as a state where BCBS has covered telemedicine. However, Colorado’s statute did not go into effect until January 1, 2002 making it likely that this data is simply not available yet.

⁵³ California, Hawaii, Kentucky, Louisiana and Texas.

⁵⁴ HAW. REV. STAT. § 432D-23.5(c) (2000).

⁵⁵ HAW. REV. STAT. § 432:1-601.5(c) (2000).

⁵⁶ HAW. REV. STAT. § 432:10A-116.3(c) (2000).

⁵⁷ HAW. REV. STAT. § 432D-23.5(c) (2000); HAW. REV. STAT. § 432:1-601.5(c) (2000); HAW. REV. STAT. § 432:10A-116.3(c) (2000).

⁵⁸ LA. REV. STAT. ANN. § 22:657(F) (West. Supp. 2003). In Louisiana, health insurance policies must pay the originating physician at least seventy-five percent of the “reasonable and customary amount of payment, benefit, or reimbursement which that licensed physician receives for an intermediate office visit” if he or she is physically present with the patient who is the subject of the electronic imaging transmission and is contemporaneously communicating and interacting with the remote licensed physician. § 22:657(F)(1). In addition, “terminology in a health and

Texas⁵⁹ have similar statutes. The same is true in Kentucky.⁶⁰ However, Kentucky does not require that telehealth consultations “provided through the use of an audio-only telephone, facsimile machine or electronic mail” be reimbursed.⁶¹ While Kentucky does not have the geographic restrictions for telemedicine reimbursement seen in Colorado, the Kentucky state statute mimics federal law because it limits mandatory telemedicine reimbursement to services other than those provided by telephone or facsimile.

The state telemedicine reimbursement statutes prove two things. First, state law in this area often follows the federal government’s lead in requiring telemedicine reimbursement. Second, states have the ability to force private insurers to cover telemedicine services within their states. However, the practical effects of these statutes remain unknown, and there is some evidence that the statutes’ exceptions make them ineffective tools for increasing telemedicine reimbursements. However, the state statutes do prevent blatant discriminatory behavior against telemedicine services by private insurers.⁶² If more states enact mandatory telemedicine reimbursement statutes, then any company wishing to be in the medical insurance business in that state will be required to reimburse for telemedicine services.

While current telemedicine reimbursement policies suggest some desire to reimburse various telemedicine services, they also show the reluctance of private and public insurers to reimburse all of their subscribers for a broad range of telemedicine services. Currently, Medicare reimbursement is limited by geographic and service restrictions, Medicaid reimbursement is a patchwork system of limited coverage, and data on private insurers is difficult to find and reveals that private insurers generally do not voluntarily cover telemedicine services. These policies suggest that insurers see some value in telemedicine services, but remain cautious. For instance, both the

accident insurance policy or contract that either discriminates against or prohibits such a method of transmitted electronic imaging or telemedicine shall be void as against public policy . . .” § 22:657(F)(2).

⁵⁹ In Texas, “[a] health benefit plan may not exclude a telemedicine medical service or a telehealth service from coverage under the plan solely because the service is not provided through a face-to-face consultation.” TEX. INS. CODE ANN. art. 21.53F, § 3(a) (2001). In addition, the deductible for telehealth services cannot not be more than the deductible for face-to-face consultations. *Id.* at § 3(b).

⁶⁰ KY. REV. STAT. ANN. § 304.17A-138(1)(a) (2001).

⁶¹ The same is true of the Colorado law. COLO. REV. STAT. § 10-16-123(3) (2002).

⁶² For instance, in some states private insurers cannot enact discriminatory measures such as higher premiums for telemedicine services.

1997 and 2001 Reports to Congress on Telemedicine discuss the fear that reimbursing telemedicine services will result in an inappropriate demand for such services or a spike in fraud and abuse. In addition, policy makers are concerned with the efficacy, cost and quality of telemedicine services. These fears coupled with a limited number of empirical studies may be responsible for the limited telemedicine reimbursement policies in both the private and public markets. It is possible, however, that something else, such as a fear of technology, a misreading of the available empirical data, or a first mover problem is occurring.

III. EMPIRICAL STUDIES ON COST, QUALITY AND ACCESS

The Reports to Congress on Telemedicine and the CMS regulations suggest that telemedicine reimbursement policies are limited due to a lack of empirical evidence that supports widespread use of telemedicine. In response to the 1997 and 2001 Reports to Congress on Telemedicine and the multiple requests for a series of empirical studies on telemedicine, many empirical studies have emerged. The paper analyzes the available empirical studies by focusing on three main tenets used to measure a health care system's performance, cost, quality and access. These three goals of health care often are referred to as the "iron triangle of health care" symbolizing the necessary and difficult ways in which these factors interlock.⁶³ To date, the empirical studies suggest that telemedicine leads to lower costs, particularly if telemedicine technology is used for an extended period of time, likely improves or maintains quality,

⁶³ Ideally, a health care system will be low cost, high quality and accessible to all who need its services. Cost, quality and access are referred to as "the iron triangle" because all three of these goals can never be met. Instead there is a constant struggle between the three points of the triangle such that when two of the goals are fulfilled, the third is lacking. For example, in the United States the quality of the health care is very high and people travel from foreign countries to take advantage of our technology and skilled practitioners. In addition, our cost of health care is respectively low. Many Americans, according to a 2001 survey, receive health care through their employers for an average of \$30 a month if single and \$150 a month for family coverage. CBS, *Cost of Health Insurance Skyrockets* (Sept. 6, 2001), at <http://www.cbsnews.com/stories/2001/09/06/eveningnews/printable309941.shtml>. These rates are low even in light of a "huge" premium increase. *Id.* However, access in America is limited and over 40 million Americans are uninsured. If the United States were to provide health care to all Americans, it is likely that either costs will rise significantly or quality will falter. For more information about the iron triangle of health care see WILLIAM L. KISSICK, M.D., DR. PH.D., *MEDICINE'S DILEMMAS* (1994).

and increases access. These findings indicate that telemedicine, through improved technology, relaxes the constraints of the iron triangle and raises it to a new plateau.⁶⁴ This section will address each point of the iron triangle, cost, quality, and access, in turn to demonstrate this phenomenon.

A. Cost

While very difficult to measure empirically, there is some data suggesting that telemedicine may have a positive effect on the cost of health care, decreasing treatment cost below that for the traditional alternatives. Since health care is the largest industry in the United States any cost savings, even if minimal, is of great interest.⁶⁵ As

⁶⁴ These findings might also suggest that telemedicine is breaking the iron triangle. However, there are still constraints created by the iron triangle that limit the amount of cost savings, quality improvement and increased access. Technology does not seem to eliminate these constraints (i.e., break the iron triangle), but rather relaxes the constraints so that improvement can be seen on all three points. Dr. Kissick would probably argue that this assertion is impossible. He might argue that while telemedicine improves quality and access, there are lots of costs contrary to what the studies show. For instance, the development of telemedicine technologies is not being taken into account in this paper's assessment of cost. Rather, the paper focus's on cost-effectiveness versus total cost of the technology. After listing a series of scientific improvements in the treatment of disease, Dr. Kissick states that "[i]n recent decades we have expanded both access and quality, but only through substantial increases in cost." KISSICK, *supra* note 63, at 2. However, many of the research costs involved in developing telemedicine technology come not only from the pursuit of better medicine, but from the pursuit of technology to improve communication and other sectors of society. In other words, many of the benefits to health care from telemedicine innovation is likely a positive externality of research that would be done regardless of the health care benefits. While Kissick's iron triangle theory seems to discount the ability of technology to relax the iron triangle constraints, he does not address technology in great detail in his book. *Id.* at 5. He does, however, give the example of the polo vaccine as the "model for biomedical aspirations" because it has "the highest cost-benefit ratio of any postwar biomedical development." *Id.* Ironically, the polo vaccine was also widely available, hence the ability to virtually eliminate the disease, and provided a high quality of care. Perhaps telemedicine fits into the polo vaccine paradigm, thereby taking the iron triangle to a similarly high plateau.

⁶⁵ The U.S. spent 1.2 trillion dollars on health care in 1999 representing 13.0 percent of our gross domestic product. Stephen Heffler, et al., *Health Spending Growth Up in 1999: Faster Growth Expected in the Future*, 20 HEALTH AFF. 193-94 (March/April 2001); Health Care Financing Admin., *Highlights – National Health Expenditures, 1999*, available at <http://hcfa.gov/stats/nhe-oact/hilites.htm> (last visited Mar. 2001). This is up 7.9% percent from 1960, and there is no sign of this trend slowing down. Centers for Medicare & Medicaid, Office of the Actuary, *National Health Care Expenditures Projections Tables* (visited Jan. 5, 2002) at <http://www.cms.hhs.gov/statistics/nhe/projections-2001/t5.asp>. "If Congress makes no change to current law . . . health spending growth will continue at rates faster than

public and private insurers struggle to reduce costs without significantly reducing quality, they turn to new technologies in hope of finding lower costs, better quality and improved access, the holy grail of health care. Telemedicine may hold at least part of the answer to this quest by raising the iron triangle to a new plateau. However, while insurers are desperately searching for ways to reduce costs, they are also very wary of possible pitfalls, the sirens of healthcare if you will, where new technology seems to promise great things, but produces less than desirable results.⁶⁶ Insurers fear that if they chase after these new technologies without hard evidence of their cost savings, their ship may end up crashing against the shores of bankruptcy, poor quality care, or an inappropriately high demand for ineffective telehealth services.

Correctly determining the costs and benefits of telemedicine is challenging.⁶⁷ There is confusion about what constitutes a cost and a benefit, there are positive and negative externalities that must be taken into consideration, and then there is the difficulty of designing studies to accurately measure costs and benefits. At this point in the paper, all three considerations will be addressed. Then the paper will examine the available empirical studies to determine the cost-effectiveness of telemedicine as reported by the studies. Later, Part D of Section III will address the difficulty of designing empirical studies to accurately measure cost, quality and access in more detail.

First, it is often difficult to determine exactly what is a cost and what is a benefit. Obviously monetary contributions to purchase the equipment, physician fees, and broadband connections are costs of telemedicine. So maybe the way to value telemedicine is a dollar for dollar comparison between the actual monetary costs for telemedicine versus the costs for the same service provided face-to-face. But what costs does a researcher include? For instance, the cost of the

in the 1990s but slower than the previous three decades." Stephen Heffler, et al., *Health Spending Growth Up in 1999: Faster Growth Expected in the Future*, 20 HEALTH AFF. 193, 202 (2001). By 2010 it is estimated that 2.6 trillion will be spent on health care representing 15.9% of the U.S.'s gross domestic product. *Id.* at 194.

⁶⁶ KISSICK, *supra* note 63, at 6 (giving gene therapy as an example of a technology that has produced few positive results relative to the research resources invested in it). While billions of dollars have been spent on gene therapy during the past two decades in hope of finding miraculous cures for genetic diseases, virtually no progress has been made to date.

⁶⁷ Stefan Hakansson & Cavin Gavelin, *What Do We Really Know About the Cost-Effectiveness of Telemedicine?*, 6 J. TELEMED. & TELEcare S133, S135 (Supp. I 2000). See also Richard Wootton, *Letters: Societal Cost-Benefit Analysis of Teledermatology, Author's Reply*, 321 BRIT. MED. J. 896 (2000) (noting the difficulty measuring psychological impact and increased job satisfaction in this field).

broadband technology needed to carry digital images or sound bites seems like a valid cost of telemedicine, yet Medicare will not reimburse for telephone or facsimile costs and this cost often falls on the practitioner providing telemedicine services.

Second, the costs and benefits of telemedicine do not fall upon the shoulders of one group of people, for instance the insurers. Instead costs and benefits are spread among the physicians, hospitals, patients and insurers, making an exact cost-benefit analysis difficult. As telemedicine studies often ignore these benefits and costs (positive and negative externalities), a study's determination of cost-effectiveness may be seriously flawed. The costs and the benefits that flow to the patient provide a good example of how easy it is for researchers to miss externalities and how, even if they recognize the externalities, measuring them is virtually impossible. For instance, if telemedicine means that a patient only has to take half a day off from work instead of two days to travel to a remote location, a researcher conducting a telemedicine cost-effectiveness study may have a difficult time measuring this benefit. One way to measure this benefit might be to determine the value of the patient's salary for one and a half days of work plus the cost of gasoline and the cost of adding mileage to the patient's car. However, this measurement ignores an array of benefits to the patient that have real value such as increased patient moral.⁶⁸ As most insurance policies do not reimburse travel time, a researcher comparing the cost to insurers of telemedicine services versus its traditional counterparts will likely miscalculate the actual benefits of telemedicine and underestimate the cost-savings.⁶⁹ Therefore, even if telemedicine provides a net positive benefit to all parties involved, insurers may not be willing to reimburse such services because insurer incentives may not be aligned with the most socially cost-effective methods of treating patients.

In addition, even if insurers agree to pay for telemedicine services via an interactive consultation, like Medicare does, that does not mean

⁶⁸ It also ignores benefits to the physicians. Physicians at the originating site (the site where the patient is located) can learn by having their patients participate in telemedicine consultations with remote physicians and specialists who not only help diagnosis, treat, or manage the patient, but often converse with the originating physician. One study even concluded that telemedicine consultations reduced the number of referrals and raised the competency of general practitioners. L. Carle, et al., *Telemedicine in Sparsely Populated Areas Yield Satisfied Patients and Better Competence*, 98 LAKARTIDNINGEN 4049 (2001).

⁶⁹ Conversely, if researchers fail to take into account the costs that physicians and/or hospitals must bear to buy telemedicine equipment, maintain the equipment, and train practitioners and staff to use the equipment (negative externalities), then they may overestimate the cost-savings of telemedicine.

telemedicine will flourish. Doctors at the local site providing telemedicine services are not reimbursed for time spent with patients during the consult unless they perform additional services. In addition, the local doctors must pay for the equipment, the equipment maintenance, transmission cost and staff training. Currently, Medicare only provides for a \$20 facility fee to recover these costs.⁷⁰ Therefore, even if insurer's incentives are aligned with those of the patients, telemedicine may prove too costly for the provider.

Third, designing studies that accurately measure the cost-effectiveness of telemedicine is difficult. In recent years, however, several studies have been done on the cost effectiveness of telemedicine.⁷¹ In addition, several papers have reviewed these studies in an attempt make generalizations about the cost-effectiveness of telemedicine.⁷² Several of the papers determine that there is not enough good data for determinations to be made, positive or negative, about the cost-effectiveness of telemedicine.⁷³ Often this is because the studies that these articles review are not easily analyzed

⁷⁰ 66 FED. REG. 55282 (Nov. 1, 2001).

⁷¹ See, e.g., Kari Harno et. al., *Clinical Effectiveness and Cost Analysis of Patient Referral by Videoconferencing in Orthopaedics*, 7 J. TELEMED. & TELE CARE 219 (2001) (studying the effects of telemedicine services in Ireland); M.A. Loane et. al., *A Randomized Controlled Trial Assessing the Health Economics of Realtime Teledermatology Compared With Conventional Care: An Urban Versus Rural Perspective*, 7 TELEMED. & TELE CARE 108 (2001) (comparing the cost-effectiveness of telemedicine in urban and rural areas of Northern Ireland); Marie Beach et. al., *Evaluating Telemedicine in an Accident and Emergency Setting*, 64 COMPUTER METHODS & PROGRAMS BIOMED. 215 (2001) (examining the cost effectiveness of telemedicine in both a minor injury unit and a hospital accident and emergency department); Kathryn H. Dansky et. al., *Cost Analysis of Telehomecare*, 7 TELEMED. J. & E-HEALTH 225 (2001) (exploring the cost-benefit ratio of telehomecare in a large urban home health agency); R. Wootton et. al., *Multicentre Randomised Control Trial Comparing Real Time Teledermatology with Conventional Out Patient Dermatological Care: Societal Cost-Benefit Analysis*, 320 BRIT. MED. J. 1252 (2000) (concluding that teledermatology is feasible but cost ineffective).

⁷² See, e.g., Richard Wootton, *Recent Advances: Telemedicine*, 323 BRIT. MED. J. 557 (2001); Pamela Whitten, Charles Kingsley & Jim Grigsby, *Results of a Meta-Analysis of Cost-Benefit Research: Is This a Question Worth Asking?*, 6 TELEMED. & TELE CARE 54 (Supp. I 2000); F.S. Mari et. al., *A Review of Telemedicine Cost-Effectiveness Studies*, 6 TELEMED. & TELE CARE S38 (Supp. I 2000); Hakansson & Gavelin, *supra* note 67.

⁷³ One meta-analysis of telemedicine cost research studies concluded that it was too premature for generalizations to be made about the cost-effectiveness of telemedicine because the studies analyzed were poorly designed or conducted. Whitten, Kingsley & Grigsby, *supra* note 72, at 55-56. Another article identified several important weaknesses in published telemedicine cost-effectiveness studies and called for better design of economic evaluations of telemedicine. Mari et. al., *supra* note 72, at 540.

due to a small sample size, a restricted geographic location, a restricted practice area, poor design, or failure to include an important element in the study such as a control group.⁷⁴ Also, some authors complain that there is simply not enough available research on most telemedicine services' cost-effectiveness to make any clear determinations.⁷⁵ These issues will be addressed in more detail in Part D of Section III of the paper as they apply to studies measuring cost, quality and access. However, a review of the available empirical studies measuring telemedicine cost effectiveness suggest that some sectors of telemedicine, such as teleradiology⁷⁶ or teledermatology,⁷⁷ are somewhat cost effective. Although teleradiology and teledermatology are the only telemedicine services that are proven, at least to some extent, to be cost effective, Medicare will not reimburse such store and forward telemedicine services⁷⁸ unless the patient is participating in a Federal telemedicine demonstration project in Alaska or Hawaii.⁷⁹

Even though the empirical data supporting the cost-effectiveness of telemedicine may be weak, there are various theoretical reasons to suspect that telemedicine will prove cost-effective over time. For instance, economies of scale and a proper accounting of externalities could prove telemedicine cost-effective. To date, very few empirical studies have taken these effects into account when measuring cost effectiveness. However, even without these theoretical reasons to suspect costs savings, the current empirical studies suggest that

⁷⁴ Mari et. al., *supra* note 72, at S39-40.

⁷⁵ This is true in the case of home telenursing, electronic referrals to specialists and hospitals, teleconsulting between general practitioners and specialists, minor injuries telemedicine, call centers and online health. Wootton, *supra* note 72, at 557.

⁷⁶ There is some convincing evidence that teleradiology is cost effective. *Id.* at 558. Teleradiology is sending digital x-ray images to a radiologist in a remote location for a specialist's opinion. *Id.*

⁷⁷ Some studies showed that while the costs of teledermatology were higher than those for a conventional dermatology consultation due to fixed equipment costs, increased use of a teledermatology system improved its cost effectiveness suggesting that as equipment costs go down and the number of uses for each set of equipment goes up, the cost effectiveness of teledermatology is improved. Wootton et. al., *supra* note 71, at 1255. *See also* Loane et al., *supra* note 71, at 116-17.

⁷⁸ 42 C.F.R. § 410.78(a)(1) defines "[a]synchronous store and forward technologies" as the "transmission of a patient's medical information from an originating site to the physician or practitioner at the distant site. The physician or practitioner at the distant site can review the medical case without the patient being present . . . Dermatological photographs, for example, a photograph of a skin lesion, may be considered to meet the requirement of a single media format under this provision." Digital images of X-rays also qualify as a store and forward technology.

⁷⁹ 42 C.F.R. § 410.78(d).

telemedicine should be reimbursed in certain sectors such as radiology and teledermatology.

B. Quality

The second point in the iron triangle, quality, is a measure of several different aspects of care, that, like cost, can be difficult to measure. Most available telemedicine studies on quality fall into one of three camps, patient satisfaction studies, clinician satisfaction studies, or outcome comparison studies. While there have been study design problems in empirical studies measuring quality, the general result of these studies is that telemedicine either maintains or improves the quality of care in most areas of telemedicine. This part of the paper will first discuss the difficulty in measuring quality of care. Next the paper will categorize the quality studies into one of three groups, patient satisfaction studies, clinician satisfaction studies, or studies that compare the outcomes of those treated via telemedicine with the outcomes of those treated via telemedicine's traditional counterparts. Finally, this part of the paper will briefly review some of the problems with empirical studies that measure quality, leaving the bulk of this discussion for Part D, and conclude that telemedicine either increases or maintains the quality of health care the patient receives.

One might assume that quality of care is easy to measure, simply compare the clinical outcomes of patients treated via telemedicine to those treated via telemedicine's traditional counterparts. However, defining quality care is difficult.⁸⁰ Several conflicting definitions of quality care exist, and "[r]esearch has indicated that one's role in the health care delivery process is likely to influence how one defines quality."⁸¹ In addition to clinical outcome, measures such as patient satisfaction, clinician satisfaction, quality of life, accuracy of diagnosis, management of illness, and use of the appropriate technologies all help define quality of care.

Identifying and measuring the appropriate variable for assessing the quality of care provided via a particular service is difficult. Therefore, experts have developed approaches to help them study these effects. Structure, process, and outcome are three commonly

⁸⁰ Beth C. Weitzman, *HEALTH CARE DELIVERY IN THE UNITED STATES: Improving Quality of Care*, 374 (Anthony R. Kovner & Steven Jonas eds., 1999).

⁸¹ Physicians tend to focus on the scientific aspects of quality. *Id.* at 375. Patients tend to focus on "interpersonal aspects," such as length of visit and physician interest, in assessing quality of care. *Id.* at 375-76.

used approaches to determining the measures of quality of care.⁸² Structure includes the characteristics “of the providers of care, of the tools and resources they have at their disposal, and of the physical and organizational settings in which they work.”⁸³ Examples of structural indicators include “board certification for physicians, nurse/bed ratios for hospitals, and availability of laboratory facilities for HMOs.”⁸⁴ Process is what occurs between the provider and the patient and includes both the technical management of care and interpersonal aspects of care.⁸⁵ A technical example of process is whether or not the right test was ordered after the telemedicine consult, and an interpersonal example of process is whether or not the patient was satisfied with the way in which the telemedicine consultation was conducted. Finally, outcome refers to a change in the patient’s health status that is the result of care.⁸⁶ Measures of outcome include mortality rates, length of hospital stay, and quality of life.

These three approaches to finding variables that measure quality, structure, process, and outcome, are important for the purposes of this paper because they make it clearer which telemedicine studies are trying to measure some variable of quality. For instance papers that focus on structural, procedural and outcome approaches to evaluating telemedicine are attempting to evaluate some aspect of telemedicine quality even if the authors fail to explicitly mention the word quality within their work. This means that studies measuring clinical outcomes (outcome) in relation to the electronic equipment used (structure) are measuring quality. In addition, articles that measure patient satisfaction (process) in light of clinical outcomes (outcome) are also measuring quality.⁸⁷

Most available telemedicine research studies that focus on quality of care assess patient satisfaction⁸⁸ and/or clinician satisfaction⁸⁹ or

⁸² *Id.* at 379.

⁸³ *Id.* (citing Avedis Donabedian, EXPLORATIONS IN QUALITY ASSESSMENT AND MONITORING: THE DEFINITION OF QUALITY AND APPROACHES TO ITS ASSESSMENT 81 (1980)).

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ The relationship between structure, process and outcome is very complicated. When assessing or designing scientific studies to measure some aspect of the quality of health care, the researcher must pay particular attention to the relationship between these approaches. For more information concerning the way to properly measure quality see *id.* at 378-96.

⁸⁸ *E.g.*, Betty L. Chang et al., *Consumer Satisfaction with Telehealth Advice-Nursing*, 10 MEDINFO 1435, 1435-39 (2001); D.R. Elford et al., *A Prospective Satisfaction Study and Cost Analysis of a Pilot Child Telepsychiatry Service in Newfoundland*, 7 J. TELEMED. & TELE CARE 73 (2001) (examining patient satisfaction

compare results in traditional medical settings to their telemedicine equivalent.⁹⁰ In addition, there are several literature reviews that survey either patient and/or clinician satisfaction studies⁹¹ or comparative studies.⁹²

Patient satisfaction is one of the most researched areas in telemedicine.⁹³ In fact, researchers have studied patient satisfaction of telephone advice services,⁹⁴ telehomecare,⁹⁵ store-and-forward

of a telepsychiatry program); Young Moon Chae et al., *Patient Satisfaction with Telemedicine in Home Health Services for the Elderly*, 61 INT'L J. MED. INFORMATICS 167 (2001); J. Simpson et al., *Telepsychiatry as a Routine Service – The Perspective of the Patient*, 7 J. TELEMED. & TELE CARE 155 (2001); Tracy Williams et al., *Patient Satisfaction with Store-and-Forward Teledermatology*, 7 J. TELEMED. & TELE CARE S45 (Supp. I 2001); R.L. Bratton & T.M. Short, *Patient Satisfaction with Telemedicine: A Comparison Study of Geriatric Patients*, 7 J. TELEMED. & TELE CARE 85 (2001); see, e.g., P.S. Whitten & F. Mair, *Telemedicine and Patient Satisfaction: Current Status and Future Directions*, 6 TELEMED. J. & E-HEALTH 417 (2000); Frances Mair et al., *Patients' Perceptions of a Telemedicine Specialty Clinic*, 6 J. TELEMED. & TELE CARE 36 (2000) (finding that patients were pleased with greater access to services); Susan S. Gustke et al., *Patient Satisfaction with Telemedicine*, 6 TELEMED. J. 5 (2000).

⁸⁹ E.g., Marie A. Krousel-Wood et al., *Patient and Physician Satisfaction in a Clinical Study of Telemedicine in a Hypertensive Patient Population*, 7 J. TELEMED. & TELE CARE 206 (2001); R.L. Bratton, *Patient and Physician Satisfaction with Telemedicine for Monitoring Vital Signs*, 7 J. TELEMED. & TELE CARE S72 (Supp. I 2001); Thomas S. Nesbitt et al., *Development of a Telemedicine Program: A Review of 1,000 Videoconferencing Consultations*, 173 W.J. MED. 169 (2000).

⁹⁰ See, e.g., Barbara M. Rohland, *Telepsychiatry in the Heartland: If We Build It, Will They Come?*, 37 COMMUNITY MENTAL HEALTH J. 449 (2001) (comparing the quality of care of persons using telemedicine to that of persons using traditional face-to-face services); W.D. Bradford et al., *Testing Efficacy with Detection Controlled Estimation: an Application to Telemedicine*, 10 HEALTH ECON. 553 (2001); S. Hashimoto et al., *Clinical Efficacy of Telemedicine in Emergency Radiotherapy for Malignant Spinal Cord Compression*, 14 J. DIGITAL IMAGING: OFFICIAL J SOC. COMPUTER APPLICATIONS RADIOLOGY 124 (2001) (comparing the conventional and telemedicine approaches in treating malignant spinal cord compression); Leo Anthony Celi et al., *The eICU: It's Not Just Telemedicine*, 29 CRITICAL CARE MED. N183 (Supp. 2001); E.J. Nordal et al., *A Comparative Study of Teleconsultations Versus Face-To-Face Consultations*, 7 J. TELEMED. & TELE CARE 257 (2001) (comparing "the diagnosis made by one dermatologist via telemedicine with those of another dermatologist made in a face-to-face consultation").

⁹¹ See, e.g., F. Mair & P. Whitten, *Systematic Review of Studies of Patient Satisfaction with Telemedicine*, 320 BRIT. MED. J. 1517 (2000).

⁹² See, e.g., Risto Roine et al., *Assessing Telemedicine: A Systematic Review of the Literature*, 165 CAN. MED. ASSOC. J. 765 (2001).

⁹³ P.S. Whitten & F. Mair, *supra* note 88.

⁹⁴ Betty L. Chang et al., *Consumer Satisfaction with Telehealth Advice-Nursing*, in MEDINFO 2001: PROCEEDINGS OF THE 10TH WORLD CONGRESS ON MEDICAL INFORMATICS 1435 (V.L. Patel et al., eds., 2001)

⁹⁵ Chae et al., *supra* note 88; George Demiris et al., *Change of Patients'*

teledermatology,⁹⁶ and interactive video consultations.⁹⁷ Generally, patient satisfaction rates are very high. For instance, one study found that 93.2 percent of the consumers who called a telephone advice service run by nurses found the advice to be “very or somewhat helpful” and 95.4 percent were “completely or at least somewhat satisfied.”⁹⁸ Another study reported that 93 percent of patients were satisfied with their teledermatology experience even though they never met with a dermatologist.⁹⁹ For interactive video consultations that were conducted in a range of specialties patient satisfaction rates ranged from roughly 89 percent to 98.3 percent. One study focused on the satisfaction of both children patients and their parents following telepsychiatry consultations. On a five-point scale 28 of 30 parents rated their satisfaction as a five (the other two parents rated their satisfaction as a 4), and 29 of 30 parents preferred the telepsychiatry assessment to traveling to see a child psychiatrist.¹⁰⁰ Eleven children and 19 adolescents participated in the survey, and their satisfaction was similar to that of their parents.¹⁰¹ In addition to individual telemedicine studies, a literature survey on real time interactive video consultation studies also concluded that patients were generally satisfied with teleconsultations.¹⁰²

However, patient satisfaction studies did reveal some patient doubts. In one study, 40 percent of the patients said they would be more comfortable seeing a physician and only 58 percent were comfortable not speaking with a dermatologist about their skin condition.¹⁰³ However, in this study patients did not consult with a doctor, whereas in most telemedicine situations, the patient does meet with their general practitioner. The authors suggest that this may have contributed to a somewhat lower satisfaction rate than that in other telemedicine studies.¹⁰⁴ Another interactive telemedicine consultation

Perceptions of TeleHomeCare, 7 TELEMED. J. & E-HEALTH 241 (2001).

⁹⁶ Williams et al., *supra* note 88.

⁹⁷ See Elford et al, *supra* note 88 (employing a “PC-based videoconferencing system”); Simpson et al., *supra* note 88; Mair, *supra* note 88 (determining patients’ perceptions of using interactive video as a way of delivering specialist care); Gustke et al., *supra* note 88, at 9.

⁹⁸ Chang et al., *supra* note 88, at 1435.

⁹⁹ Patients in this study had their skin condition photographed and digitally sent to a remote dermatologist who later responded with management advice. Williams et al., *supra* note 88, at S46.

¹⁰⁰ Elford, *supra* note 88, at 73.

¹⁰¹ *Id.*

¹⁰² F. Mair & P. Whitten, *supra* note 91, at 1518-19.

¹⁰³ Williams et al., *supra* note 88, at S46.

¹⁰⁴ *Id.*

study suggests that patient satisfaction rates were artificially high in their study because participants occasionally saw the remote specialist in person and therefore perceived the teleconsultations as serving mainly a “monitoring” function.¹⁰⁵ These studies show that while telemedicine patient satisfaction is very high, suggesting equivalent, if not improved, quality as compared to traditional services, there are limitations on the uses of telemedicine. One of these limitations may be the desire to see a general practitioner in person. If telemedicine is used without regard to such limitations, there may be a decrease in the quality of care, at least from the patient’s perspective.

Another measure of the quality of telemedicine is clinician satisfaction. Many studies assessing physician or clinician satisfaction also looked at patient satisfaction for the same services.¹⁰⁶ Some of these studies reported a high level of both patient and physician satisfaction,¹⁰⁷ and one study even concluded that telemedicine consultations reduced the number of referrals and raised the competency of general practitioners.¹⁰⁸ Other studies, however, reported that while patients seemed to be highly satisfied with the telemedicine services they were provided, their physicians were not as pleased.¹⁰⁹ Some physicians felt that telemedicine increased their “workload, mental effort [and] technical skills” more than a regular office visit.¹¹⁰

There are at least two possible explanations for the disparity between patient and physician satisfaction, physician fear of new technology and physician fear of increased medical malpractice claims. Possibly, physicians are uncomfortable with telemedicine technology. Perhaps telemedicine makes physicians feel that they need lots of technical expertise in dealing with the new, and possibly complex, technology involved in conducting a telemedicine consultation.¹¹¹ A second explanation for the disparity between

¹⁰⁵ Mair, *supra* note 88.

¹⁰⁶ Bratton, *supra* note 89, at 725. See also Krousel-Wood et al., *supra* note 89; L. Carle et al., *Telemedicine in Sparsely Populated Areas Yield Satisfied Patients and Better Competence*, 98 LAKARTIDNINGEN 4049 (2001); Nesbitt et al., *supra* note 89, at 171.

¹⁰⁷ L. Carle et al., *Telemedicine in Sparsely Populated Areas Yield Satisfied Patients and Better Competence*, 98 LAKARTIDNINGEN 4049 (2001); Nesbitt et al., *supra* note 89, at 171-72.

¹⁰⁸ L. Carle et al., *Telemedicine in Sparsely Populated Areas Yield Satisfied Patients and Better Competence*, 98 LAKARTIDNINGEN 4049 (2001).

¹⁰⁹ Bratton, *supra* note 89, at 72; Krousel-Wood et al., *supra* note 89, at 211.

¹¹⁰ Krousel-Wood et al., *supra* note 89, at 208-09. This could be a negative externality that insurers probably do not recognize.

¹¹¹ This may or may not be true. Research studies on physician’s Internet use

patient and physician satisfaction could be a fear of increased malpractice claims. Perhaps telemedicine creates an environment that takes physicians out of their comfort zone. Physicians may fear missing something important because the patient is not in the same room. This could account for the "small but significant" increase in workload and mental effort that physicians feel when conducting a telemedicine consultation.¹¹² In fact, 55 percent of physicians feel that telemedicine cannot adequately assess patients, but 82 percent believe telemedicine will be an important part of the future of health care.¹¹³ This statistic might mean that physicians believe telemedicine will lead to a decline in the quality of care, or, more likely, that physicians recognize telemedicine as an important *supplemental* tool to be used in conjunction with traditional methods of care.

A final measure of the quality of telemedicine can be found in studies that compare telemedicine to traditional patient assessment and treatment methods. Such studies tend to concentrate on more concrete quality variables such as clinical outcome, mortality, length of hospital stay, and the number of complications a patient experiences due to his or her illness. Several studies¹¹⁴ and literature reviews¹¹⁵ have compared the success of various telemedicine applications to their traditional medical equivalents. One study focusing on maintenance care for patients with high blood pressure found that telemedicine actually misses 7% fewer cases of

conclude that the vast majority of physicians use the Internet, but that most of this use is restricted to sending and receiving personal e-mail messages. Michael Pastore, *Physicians' Internet Use Excludes Clinical Applications*, at http://www.cyberatlas.internet.com/markets/healthcare/article/0,1323,10101_708321,00.html (Mar. 8, 2001); See Information Technology Association of America, *E-Data E-Health: AMA Survey Finds Upsurge in Physician Usage and Regard for Internet*, ITAA E-Letter (2001) at <http://www.ita.org/isecc/pubs/ArticlesbySub.cfm?Subject=e-Datae-Health> (noting increase by 50% in physicians use of the Internet to check email, order products, and use online banking). One study suggests that physicians would be more apt to send clinical information about an individual patient electronically if the patient's privacy could be guaranteed. Michael Pastore, *Physicians' Internet Use Excludes Clinical Applications*, at http://www.cyberatlas.internet.com/markets/healthcare/article/0,1323,10101_708321,00.html (Mar. 8, 2001). However, telemedicine is not exactly like e-mail and involves different technology. Perhaps the technology discourages physicians or perhaps they simply do not trust the new technology because of privacy concerns.

¹¹² Krousel-Wood et al., *supra* note 89, at 208.

¹¹³ Bratton, *supra* note 89.

¹¹⁴ See, e.g., Bradford, *supra* note 90 (comparing telemedicine treatments with traditional care for hypertension); Hashimoto et al., *supra* note 90.

¹¹⁵ See Celi et al., *supra* note 90, at N183-84 (discussing a review of a traditional ICU); Roine et al., *supra* note 92, at 766.

hypertension than traditional in-person visits, suggesting that telemedicine is just as or more effective than face-to-face consultations.¹¹⁶ Another study developed a telemedicine emergency radiotherapy system (called THERAPIST) to treat patients with malignant spinal cord compression.¹¹⁷ THERAPIST allowed patients to be treated more quickly after the onset of symptoms, which probably accounted for the fact that 5 of 6 nonambulant patients became ambulant with the use of THERAPIST compared with 2 of 8 before THERAPIST was available.¹¹⁸ One literature review found mixed results as to most telemedicine services,¹¹⁹ concluding that teleradiology, teleneurosurgery, telepsychiatry, transmission of echocardiographic images, and “the use of electronic referrals enabling email consultations and video conferencing between primary and secondary health care providers” were the most effective telemedicine applications when compared to their traditional counterparts.¹²⁰ Comparative studies have also found that telemedicine monitoring in an intensive care unit (ICU) can decrease hospital mortality, the likelihood of a new permanent disability, the length of stay and ICU complications.¹²¹

However, the telemedicine quality studies are not perfect. Much like the cost effectiveness studies, the telemedicine quality studies are plagued by methodological faults such as low sample size, poor response rates, and poor study design.¹²² Many quality studies also fail to report initial refusal rates to participate in telemedicine services and do not report whether the teleconsultations are provided for free as part of a grant funded telemedicine project.¹²³ These factors may have skewed some quality results, particularly the satisfaction studies. Also, most satisfaction studies fail to define “satisfaction” leaving readers to wonder whether participants “were satisfied because

¹¹⁶ Bradford, *supra* note 90, at 563.

¹¹⁷ Hashimoto et al., *supra* note 90.

¹¹⁸ *Id.* at 128.

¹¹⁹ In some studies treatment was available faster, resulted in fewer unnecessary patient transfers, or reduced the length of stay. Other studies reviewed showed “no major differences in clinical outcomes or reattendance rates. However, other studies found that real-time teledermatology consultations resulted in suboptimum management plans in 8% of cases and inappropriate treatment plans in 9% of cases.” Roine et al., *supra* note 92.

¹²⁰ *Id.* at 770.

¹²¹ See Celi et al., *supra* note 90, at N185 (discussing the results of a study on twenty-four hour telemedicine care in the ICU).

¹²² F. Mair & P. Whitten, *supra* note 91, at 1519.

¹²³ *Id.* Whether or not the patients have to pay full price for telemedicine services could affect their level of satisfaction with the service.

telemedicine didn't kill them" or whether patients had "a wonderful experience."¹²⁴ Despite these methodological research faults, preliminary results are hopeful about the quality of telemedicine. Patient satisfaction, clinician satisfaction, and clinical outcomes all suggest that telemedicine, for the most part, either maintains or improves the quality of patient treatment.

C. Access

The final point of concern within the iron triangle of health care is access. With over 40 million Americans uninsured¹²⁵ and millions of Americans living in rural areas that lack specialists or physicians altogether, access to health care is a major issue in the United States.¹²⁶ While experts may not agree on whether telemedicine saves money or provides patients with a higher quality of care, it is difficult to argue that telemedicine does not provide improved access. For patients in rural or non-MSA areas telemedicine provides an easier alternative than several hours of travel to a specialist. Without telemedicine, many of these patients may have to wait weeks or months until they can travel to visit specialists, either because the specialists are busy, or because the patients cannot afford to take time off from work.¹²⁷ However, telemedicine allows these patients to travel to their general practitioner's office, which is presumably within a few miles from their home, where they can have a teleconference with a remote specialist. Therefore, improved access is achieved because the time and cost necessary to access the appropriate physician and receive an accurate diagnosis and timely treatment is diminished. Access is also improved because more people will be able to see specialists or get second opinions. For instance, if the costs of traveling to see a specialist are high or the adventure too time-consuming, many patients are likely to forgo the visit. This is especially true if the patient is seeking a second opinion.

¹²⁴ *Id.*

¹²⁵ According to the 1999 figures, 42.6 million Americans are uninsured. U.S. Census Bureau, *Chances of Having Health Insurance Increase, Reversing 12-Year Trend, Census Bureau Says*, U.S. Dept. of Comm. News (Sept. 28, 2000) at <http://www.census.gov/Press-Release/www/2000/cb00-160.html>.

¹²⁶ For instance, there have been many proposals for a national health care plan that would provide a minimum amount of care to all Americans. To date these efforts have failed to produce a national health reform plan. John Billings, *Access to Health Care Services*, HEALTH CARE DELIVERY IN THE UNITED STATES 401, 402 (Anthony R. Kovner & Steven Jonas eds., 6th ed., 1999).

¹²⁷ In rural areas, the absence of certain types of physicians or facilities can have a detrimental effect on the ability of rural patients to obtain timely care. *Id.* at 417.

While a few studies note improved access as a result of telemedicine,¹²⁸ most studies simply assume that access is improved. This assumption makes practical sense, at least for patients living in rural areas. However, there are many underlying issues that telemedicine surveys fail to acknowledge. While access almost certainly improves for those in rural areas, there may be a reciprocal decrease in access for people who normally have access to the specialist. For instance, if a specialist in Chicago sees twenty patients a day and begins practicing telemedicine, the patients that live in Chicago may have to wait an extra day to get an appointment or a hour longer in the waiting room before the physician is available. Certainly, if there are a finite number of physicians, this will be the case.¹²⁹ To date, there are no studies on this possible negative side effect of telemedicine.

D. Problems with the Empirical Studies

While available empirical studies on telemedicine provide valuable information, there are also some methodological and applicability problems with these studies. The methodological problems include low sample size, poor response rates, and poor study design.¹³⁰ As discussed above, particular types of studies, such as those assessing cost and quality, can also have their own specific methodological problems, such as the receipt of free services skewing patient satisfaction studies.

In addition to methodological problems, many telemedicine empirical studies also have problems associated with cross-country, cross-state, and cross-discipline applicability. For instance, most of the telemedicine cost-effectiveness studies are done in western European countries such as the United Kingdom. American literature reviews of these studies often fail to filter out non-American studies, probably because of the low number of available studies. Therefore, the studies' conclusions may not be applicable to the

¹²⁸ See, eg., *Telemedicine for the Medicare Populations: Pediatric, Obstetric, and Clinician-Indirect Home Interventions in Telemedicine*, 24 EVIDENCE REP./TECH. ASSESSMENT Supp., 2-3 (2001) (noting increased access to medical care through telemedicine, especially where communication is timely).

¹²⁹ If introducing telemedicine in rural areas increases access for rural patients and the demand for specialists by urban patients remains constant, an economist would hypothesize that this increased demand will lead to higher prices for specialists. Subsequently, more specialists will enter the market to meet demand and drive price down to the equilibrium price. However, there is evidence that a limited number of physicians enter the market each year due to government regulations.

¹³⁰ F. Mair & P. Whitten, *supra* note 91, at 1519.

United States, which has a very different health care system because it lacks some form of public health insurance generally available in Europe.

In addition to cross-country applicability, one might also be concerned with cross-state applicability. For instance, there may be problems associated with basing a national Medicare teledermatology reimbursement policy on a teledermatology cost-effectiveness study performed in Kansas. While teledermatology may be cost-effective in Kansas, there is no guarantee the results will carry over to similar teledermatology programs in New York or North Carolina. One simple way to solve this problem is to leave reimbursement decisions up to the Medicare carriers for each state. Each state has a Medicare carrier that can establish Local Medical Review Policies (LMRPs), which will determine the services that Medicare will or will not cover within that state. These rules are in effect for that state as long as they do not conflict with a national Medicare policy. One problem with this approach is that a patchwork of coverage results so that an Indiana resident may have a certain telemedicine procedure covered while an Illinois resident living a half hour away may not get reimbursed for the same service. While patchwork reimbursement already exists to a great extent for many procedures, patchwork reimbursement for telemedicine services may provide additional difficulties because telemedicine involves physicians from remote locations, making a patchwork system of coverage seem particularly unfair, and a physician who practices telemedicine from a remote site must be particularly careful about the state residency of his patients.. For instance, a New York physician practicing telemedicine may have to turn away patients that live in a particular state because Medicare will not reimburse his services. This suggests that a national telemedicine reimbursement policy may be a better idea than a system of LMRPs.

The cross-discipline applicability of telemedicine empirical studies may raise some concern, particularly where decision-makers must determine whether or not the results from a specific telemedicine study can be generalized in a way that provides meaningful data about all telemedicine services.¹³¹ Many telemedicine studies focus on a highly specialized area, such as telepsychiatry, making it difficult to determine if the results apply to a broad variety of telemedicine services. For now, it seems that individual studies need to be done for each discipline to determine whether telemedicine provides advantages over the traditional methods of treatment. While

¹³¹ P.S. Whitten & F. Mair, *supra* note 88.

teleradiology seems particularly promising, that does not mean that telecardiology will be successful, particularly if surgery is needed.

E. Empirical Study Summary

While telemedicine studies assessing cost, quality, and access may not be perfect, they do suggest that telemedicine may be a good thing. First, telemedicine likely improves access. In addition, there is quite a bit of scientific information, albeit not nearly enough for a clear assessment, that telemedicine improves health care quality. This is especially true in the area of patient satisfaction. Finally, there is some evidence that telemedicine, if used for substantial periods of times, is cost-effective. The time factor is important because it allows the high fixed costs associated with buying the telemedicine equipment to be recovered through incremental charges to a number of patients. As the equipment is utilized, the average price of telemedicine equals or falls below that of a face-to-face consultation. It seems that at least for rural residents, telemedicine does provide improved access at lower costs (over time) with higher quality of care. More importantly, there is no evidence that telemedicine (if analyzed over time) causes any great harms such as skyrocketing costs or lots of medical mistakes. Therefore, it seems as if telemedicine, through improved technology, has raised the iron triangle to a new plateau.

IV. THE FUTURE

This section of the paper explores the future of telemedicine. First it examines the expected effects of telemedicine on the organizational structure of the healthcare system using both empirical studies and basic economic principles. Second, this section addresses who should lead the way in making telemedicine reimbursement decisions. The paper hypothesizes that Medicare should take the lead in making telemedicine reimbursement policies because it has historically done so and because the free market may not be able to determine the best telemedicine reimbursement policy due to the moral hazard problem, the government having superior information, the first mover problem, and the fact that private insurers often fail to take positive and negative externalities into account. Finally, this section of the paper makes two policy suggestions. First, that reimbursement should not be decided solely on the geographic locality of the patient, but rather should be based on a multitude of factors that would suggest telemedicine as the most efficient treatment method in a particular situation. Second, Medicare and other insurers should reimburse store and forward technologies because empirical studies have shown these to be cost-effective and high quality.

A. Effects of Telemedicine on the Organizational Structure of Health Care

As with any new medical technology, telemedicine will create some changes in the organizational structure of health care. Both empirical studies and economic principles suggest that telemedicine will change the way that health care is provided. First, empirical studies have shown that telemedicine will create economies of scale in such a way that either combines management of several health clinics or physically combines health clinics. Second, economic principles suggest that telemedicine will lead to specialization of physicians because it eliminates the geographic barriers that define the centers of competition, thereby creating a broader population base to support greater specialization. Third, telemedicine may change the way that patients interact with their physicians, the way that physicians and other clinicians interact with each other, the way that insurers behave, and consequently the structure of the health care system and society's attitudes about medicine.

To date, there are very few empirical studies analyzing the organizational consequences of telemedicine.¹³² However, it has been hypothesized that telemedicine will effect four major groups of people, patients, providers, insurers and society.¹³³ The empirical studies seem to support this hypothesis. In fact, telemedicine may have more direct consequences on the health care system than previously hypothesized.¹³⁴ Empirical studies find that telemedicine changes work processes, organizational structuring, mechanisms for internal coordination, the flow of patients, clinician job descriptions and places of work.¹³⁵ In addition, a basic health care economics analysis supports these findings and further suggests that telemedicine will lead to greater physician specialization.

¹³² I.H. Monrad Aas, *A Qualitative Study of the Organizational Consequences of Telemedicine*, 7 J. TELEMED. & TELE CARE 18, 18 (2001); Pamela S. Whitten & Ace Allen, *Analysis of Telemedicine from an Organizational Perspective*, 1 TELEMED. J. 203, 205 (1995). The lack of empirical studies may be due to telemedicine's current limited use. Many organizational impacts can only be felt when a whole sector has undergone a transformation. Some researchers, however, have measured the small-scale organizational effects of telemedicine. For now, large-scale organizational effects must be hypothesized.

¹³³ See Rainer Kretschmer & Michael Nerlich, *Assessing the Impact of Telemedicine on Health Care Management*, 64 STUDIES HEALTH TECH. & INFORMATICS 46, 49 (1999).

¹³⁴ See Aas, *supra* note 132, at 23 (noting large changes in organizational structure and work processes as a result of telemedicine usage).

¹³⁵ This is an incomplete list of changes. For a more complete list see *id.* at 25.

The best empirical study to date concerning the effects of telemedicine on the structure of health care comes from Norway.¹³⁶ This study, which interviewed health care professionals working in teledermatology, telepsychiatry, telepathology and teleotolaryngology, found several significant changes in the organization of the health care system.¹³⁷ For instance, organizational changes and changes in work process were found to result from telemedicine.¹³⁸ The organizational consequences included organizational restructuring,¹³⁹ new organizational units,¹⁴⁰ changes in patient flow through the health service, improved coordination of care, new job descriptions, relocation of the workplace, employment of personnel living far away from the workplace, minor staffing changes, clinical teamwork independent of co-location, and less travel by patients and personnel.¹⁴¹ In addition, there were also changes in work processes. For instance, there were changes in the division of labor,¹⁴² changes in the place where diagnosis and treatment occurred, and changes in the number of new skills that needed to be learned.¹⁴³ Therefore, telemedicine makes location less important and the ability to be flexible and well versed in more treatments a necessity for the local physician. The study stopped short of determining whether these effects were beneficial for the health care system as a whole, stating

¹³⁶ As discussed earlier, the fact that the study took place in Norway may limit its applicability in the United States. There are, however, no similarly complete studies available for the United States.

¹³⁷ The study's author notes that as the volume of telemedicine use increases more organizational consequences may become apparent. Aas, *supra* note 132, at 19, 22.

¹³⁸ *See id.* at 20 (noting that 53% of centers experienced organizational changes and 77% experienced work process changes).

¹³⁹ For instance, some outpatient clinics were able to merge because the manager of one clinic was able to manage two clinics via personnel teleconferences. This also changed the internal coordination of the outpatient clinics. *See id.* at 23.

¹⁴⁰ These new units included new rooms to house the telemedicine equipment and new treatment units at the remote sites so that local physicians could perform additional procedures after diagnosis. *See id.*

¹⁴¹ *See id.* (noting the multitude of changes telemedicine brought about in the localities studied).

¹⁴² Personnel had to be trained to use both the telemedicine equipment and to perform new techniques as required by telemedicine. For instance, "[w]hen frozen sections were done by telepathology, some of the work was performed at local hospitals without pathologists. Local hospitals needed to train laboratory technicians to prepare the frozen sections for microscopy and telepathology examination." *Id.* at 24.

¹⁴³ "Telemedicine increases the number of tasks and types of skill necessary for personnel" to learn at the local level. *Id.*

that telemedicine would have to become more widespread before its organizational consequences could be fully recognized.

While this paper does not attempt to provide an in-depth analysis of the possible organizational effects of telemedicine on the structure of health care, it will attempt a very simple prediction of how economies of scale and physician specialization resulting from increased use of telemedicine will lead to reduced health care costs. Currently, there are very few specialists in rural areas because there is not a broad enough population base to support a specialist. Assume, hypothetically, that 3,000 people are necessary to support a dermatologist.¹⁴⁴ Without 3,000 possible patients, the dermatologist will not be able to make money and will move to an area with a larger population. Therefore, many rural areas may not be able to support a dermatologist, and patients who need to see a dermatologist must travel to a remote dermatologist, often located in an urban area. This adds travel and time expenses, making the visit more costly for the patient. Telemedicine, in an ideal setting, eliminates these extra costs, thereby increasing a rural patient's access to practitioners and decreasing the patient's cost.¹⁴⁵ A decrease in cost will lead to a greater demand for specialists. The greater demand will cause the dermatologist to raise his or her prices. In response to higher market prices, more medical students will choose to specialize in dermatology.¹⁴⁶

¹⁴⁴ The population base needed to support a particular specialist will differ depending on the specialty. Factors such as the prevalence of disease in that specialist's field, the prevalence of the relevant disease-type in the subject population, and the average income of the population are important factors in determining the necessary population base.

¹⁴⁵ Telemedicine also eliminates geographic borders, which can serve as limits to competition. Geography, cost, and qualifications are all examples of factors that can limit competition between doctors. For example, imagine a scenario where a rural community can support one dermatologist but not two. Patients have two options. They can go to the local dermatologist, or they can take time off from work and travel an hour or two to see the next closest dermatologist. Given these options, most patients would choose the local dermatologist, even if he or she charges a slightly higher fee or has less impressive qualifications, because the overall cost to the patient is lower. In this case geography gives the dermatologist monopoly-like power. However, telemedicine can take away this power because it eliminates the geographic differences forcing the local dermatologist to compete with the remote dermatologist on price and quality.

¹⁴⁶ "The market is an effective regulator of physician supply. In the past 5 years, students gravitated toward primary care, helping to fill a market-driven need. Now that specialists are back in demand . . . the overall number of family practice matches among United States medical school graduates was 7.8% lower than in 1998." Joseph Hawkins, *Physician Employment in 2000 and Beyond*, 36 Hospital Physician 74, 82 (2000).

This specialization effect could be limited by two factors. The first of these is fairly simple. If telemedicine does not succeed in a particular field, then it can have no specialization effect. Therefore, increased specialization will only occur in fields where telemedicine is successful, such as radiology or dermatology. Second, government behavior could chill the specialization effect of telemedicine. For instance, the government has instituted programs that pay hospitals to train fewer doctors.¹⁴⁷ This effort particularly focuses on reducing the number of specialists.¹⁴⁸ Such a law effectively limits both the number of physicians and specialists. This would chill the specialization effect of telemedicine. In such a world, the number of specialists remains fixed, and telemedicine would simply increase the fees that these specialists could charge.

In addition to the economic story of change, there may be other effects on the health care system. As telemedicine reshapes the roles of clinicians and physicians, the power structure in medicine may change. One might expect to see the emergence of non-physician, clinician specialists who present patients, are experts in diagnostic testing, and essentially serve as a small community's only health care professional. Telemedicine will also have effects on the ways in which health care professionals interact with their patients. Telemedicine may make the patient-physician relationship more artificial, thereby decreasing the necessity of interpersonal skills. Conversely, telemedicine may force both doctors and patients to have

¹⁴⁷ Incentive Payments Under Plans For Voluntary Reduction in Number of Medical Residents, 42 C.F.R. § 413.88 (2002). The government will pay hospitals incentive payments over the course of five years if the hospitals voluntarily submit a plan for reducing the number of medical residents that falls within the guidelines set forth by the regulation. CMS estimates that \$400 million dollars of incentive payments will go to New York hospitals alone during a six-year period. Center for Medicare & Medicaid Services, *New York Teaching Hospitals Participate in Graduate Medical Education*, at <http://www.cms.hhs.gov/media/press/release.asp?Counter=4> (Feb. 17, 1997).

¹⁴⁸ A hospital with between 600 and 750 residents must either reduce the number of residents by 25 percent over five years or by 20 percent "if the qualifying entity increases the number of primary care residents included in the base number of residents by at least 20 percent." §413.88(g)(2)(iii). For instance, if a hospital has 600 residents (300 primary care residents and 300 residents in specialty training), one option is to cut 150 residency positions from any area the hospital chooses (the extreme results in this case are 150 primary care/ 300 specialists or 300 primary care/150 specialists). The second option is to cut 20 percent (120 positions), but at the same time raise the number of primary care spots by 20 percent (the result here would be 360 primary care/ 120 specialists). The numbers can be run for any original distribution of primary care residents versus specialists, but the result is always the same, hospitals either have to cut more total residents or severely cut the number of specialists.

more effective and thoughtful conversations. In addition, telemedicine may have a great impact on third-party payers. If Medicare, Medicaid, and private insurers reimburse telemedicine services, this may affect claims processing, billing codes, billing accuracy, and the resolution of claims. Telemedicine may also affect the way in which third-party payers structure payment agreements, consequently having a major effect on the structure of health care.¹⁴⁹ In addition, telemedicine could have multiple other effects on society that have yet to be recognized. For instance, during the past twenty years, the Internet, home computers, e-mail and cell phones have drastically changed the way that society communicates. Now, telemedicine has the potential to create some of the same changes within the health care system.

B. Who Should Be the Leader in Setting Telemedicine Reimbursement Policy?

The public sector, through Medicare,¹⁵⁰ should act first to reimburse telemedicine as opposed to the states or private insurers for two basic reasons. First, a market determination of the appropriate reimbursement policy may not be accurate because there are moral hazard concerns, asymmetric information problems, a first mover problem and private insurers often fail to recognize the positive and negative externalities of telemedicine reimbursement. Second, Medicare has traditionally been a policy leader in setting both telemedicine and other health care reimbursement policy. This section describes the traditional economics argument and then addresses each of its criticisms in turn.

An economist would argue that the private insurance market is best able to determine whether or not and for how much telemedicine services should be reimbursed. This assertion is based on the theory that an unregulated market will always determine the appropriate

¹⁴⁹ For instance, if there is mandatory fee sharing, this could give the local physician incentives or disincentives to engage in telemedicine depending upon how much payment he or she would receive for providing various telemedicine services. If this seems crazy, think about how HMO's and Medicare have changed the structure of health care through various reimbursement mechanisms like capitation and diagnosis-related groups (DRGs). These reimbursement methods have shortened the length of hospital visits, increased the number of patients physicians see each day, and reduced the number of tests they order. CHARLES E. PHELPS, *HEALTH ECONOMICS* 379-82, 418-22 (2d ed. 1997).

¹⁵⁰ Medicare, as opposed to other public actors, should be the leader, because Medicare has a bigger share of the health care market than Medicaid and can have influence in all fifty states while a state can only influence the law in 1/50th of the country.

price and quantity of a good absent market failure. For instance, if a service increases or maintains quality and/or access, without increasing cost (thereby increasing consumer demand), insurers will cover that service. However, if the service is too costly, then premiums and/or co-pays (the cost to the consumer) will rise. If the improvements created by the services (such as improved quality and access) do not sufficiently “make up” for the increased costs of the premium and/or co-pays, then the health service will not be covered. In this way the market can determine the most effective use of resources and make accurate determinations about the cost effectiveness of specific telemedicine services. However, there may be certain challenges to this theory such as moral hazard concerns, asymmetric information problems, a first mover problem and the effects of positive and negative externalities. Some of these are a cause for concern and some of them are not.

The first challenge to the economist’s view is the problem of moral hazard. Insurance works by pooling risks. Therefore, each consumer pays a fee that when added to the fees paid by all other insured within their “pool” should cover the expenses of all medical care provided plus administrative costs.¹⁵¹ Generally, health insurance plans charge the insured a premium (fixed monthly fee) and a co-pay at the time of service (usually a small amount between \$10-\$20). This promotes overuse of medial resources because the cost to the consumer at the time of service is very low. For instance, if a consumer does not feel well, he or she only has to pay a \$10 co-pay to visit his or her physician, while an uninsured consumer has to pay the full \$100 fee for the same visit. While the insured consumer really pays more than ten dollars to visit his or her physician (because of the premium), he or she pays this regardless of their decision to visit the doctor (it is a sunk cost). Therefore, the variable cost to the insured patient is \$10, while the variable cost to the uninsured patient is \$100. As a result, the insured patient is much more likely to go to the doctor than the uninsured patient if they have the same symptoms and will, in fact, end up visiting his or her doctor more frequently.¹⁵²

¹⁵¹ Of course some money is also made when this pooled money is invested in the market. This helps cover some of the costs and supplies some of the profit that the insurance companies make. In a competitive market, however, one would expect the premium to equal the expected claims plus the administrative costs. See Phelps, *supra* note 149, at 38-41 (noting that premiums include loading fees made up of administration, sales, and risk-bearing costs).

¹⁵² This ignores factors such as a hypochondriac patient or a patient being much less health than another patient. It also ignores opportunity costs.

Telemedicine may increase the risks of moral hazard because over consumption may be more likely for telemedicine than for traditional services. For instance, assume that a patient living in a rural area has access to telemedicine services. If telemedicine is not reimbursed, he or she will have to travel long distances to see a physician. The cost of taking off work and traveling will be added to their variable cost of \$10. However, if telemedicine is reimbursed, then the consumer's variable cost will be \$10 because telemedicine removes the added costs of time and travel. Therefore, telemedicine reimbursement is likely to result in increased overuse of medical resources. This thinking is reflected in the 1997 Telemedicine Report to Congress, which cites fear of over utilization as a major concern.¹⁵³ While this may be a general argument against telemedicine reimbursement,¹⁵⁴ it should not, however, necessarily effect *who* should make the reimbursement decisions.

Second, the government is a better decision maker than private insurers because the government has superior information. Medicare has invested millions in telemedicine research and, as a result, obtains empirical data faster than private insurers. For instance, the government creates most telemedicine demonstration projects and gives several million dollars each year in telemedicine research grants. This is probably more than private insurers spend researching telemedicine.¹⁵⁵ Even though empirical data from telemedicine demonstration projects becomes available to the public within a reasonable time after its discovery, the government still gets the information first. They have access to the information as soon as it becomes available, while the public often must wait for government reports to be drafted and released. Often a telemedicine demonstration project lasts several years. The government has access to interim data during this time, while the public may not. As a result, there seems to be a time lag between the discovery and release of empirical telemedicine research data. As with any new health care product, telemedicine's implementation and coverage are dependent upon scientific evidence that shows telemedicine either improves

¹⁵³ DEP'T. OF COMMERCE, TELEMED. REPORT TO THE CONG. at 59-60.

¹⁵⁴ While a valid argument against telemedicine reimbursement, this author believes that the costs associated with the increased risk of moral hazard are outweighed by the cost-saving benefits of telemedicine.

¹⁵⁵ The details of the grant process are available on the Office of the Advancement of Telehealth's website. While there is no data available on how much private insurers spend on empirical telemedicine research, my intuition is that the government spends more money because the private market has no incentive to do the research if they can get the information from the government for free.

quality and/or access or decreases cost. Because most of the telemedicine research is in the hands of the government, this may explain why Medicare generally acts first to reimburse telemedicine services and why private telemedicine reimbursement policies have historically mimicked government reimbursement policies.

Third, Medicare should be the reimbursement policy setter because there is a first mover problem. Health care involves a lot of uncertainty,¹⁵⁶ as does new technology. Telemedicine is a new technology where uncertainty is particularly high because there have been few empirical studies on its cost effectiveness and quality. Also, there are fears of increased moral hazard. In addition, the government probably has access to empirical study data before private insurers. This scenario creates a first mover problem. No single actor, for instance a private insurer, wants to be the first insurer to cover telemedicine because of the uncertainty involved. If a private insurer does move first, then they bear the risk of telemedicine's failure. Bearing such risk is not something that a private insurer wishes to do because they are in a fairly competitive market place where taking the wrong risks could put them out of business. However, the government is not competing with anyone to provide government-subsidized health care. If the government thinks that a particular technology, like telemedicine, will improve quality and lower cost, it can act as a risk bearer because it does not have to worry about being forced out of the market.¹⁵⁷ Also, private insurers know that the government conducts telemedicine demonstration projects, and that the government has an incentive to research telemedicine, especially because Medicare covers older people who may use more telemedicine services.¹⁵⁸ There is no incentive for private insurers to

¹⁵⁶ "Uncertainty as to the quality of product is perhaps more intense [in health care] than in any other important commodity." Kenneth J. Arrow, *Uncertainty and the Welfare Economics of Medical Care*, 53 AM. ECON. REV. 941, 951 (1963), reprinted in *Special Issue: Kenneth Arrow and the Changing Economics of Health Care*, 26 J. HEALTH POL., POL'Y & L. 851-853, 861 (2001).

¹⁵⁷ This is not perfectly correct, because the government is theoretically accountable for its actions. Therefore, if a government agency makes a costly mistake, one might argue that the agency is held politically accountable through elections of the President every four years because the President appoints agency heads. However, because agencies are several steps removed from the accountability process, one can argue that agencies are not as accountable as other political figures.

¹⁵⁸ Although not discussed in detail in this paper, there have been many suggested uses of telemedicine that are specific to older people such as home monitoring services. For more information about the elderly and telemedicine see Kristin Jakobsen, Note, *Space-Age Medicine, Stone-Age Government: How Medicare Reimbursement of Telemedicine Services is Depriving the Elderly of Quality Medical Treatment*, 8 ELDER L.J. 151 (2000).

act first if the government is willing to bear the risk of being the first mover. Already, it seems as if the government is taking on the role of the first-mover.¹⁵⁹

The final argument against the economist's view is that insurers fail to take into account positive and negative externalities. Because these externalities do not figure into private insurer's decision-making process, their reimbursement decisions are not accurate. Examples of positive externalities include cost and time savings on the part of patients who must currently travel to meet with their physician. Most health insurance plans do not reimburse for travel expenses, and they certainly do not reimburse patients for time taken off from work. Covering telemedicine erases these costs providing added benefits to the patients. However, insurance companies do not consider these benefits in their decision-making process because they are not currently bearing the costs of things such as travel expenses. A second example of a positive externality is the educational experience that a local physician may receive by participating in telemedicine. Physicians in rural areas may feel isolated from colleagues and medical advances. Participating in telemedicine allows these physicians to be connected to colleagues who are practicing with the newest and best medical innovations and treatments. However, insurers ignore this benefit of telemedicine reimbursement because they do not realize the benefit themselves. There are also negative externalities of telemedicine reimbursement that insurers do not take into account. The first of these is the fixed costs associated with starting a telemedicine program. Insurance generally does not pay for physicians and rural health clinics to establish telemedicine capabilities. Therefore, the physician or hospital must bear these costs and hope that telemedicine succeeds in their area so that they can recover their initial expenditures. While it is difficult to predict exactly how these positive and negative externalities figure into the decision whether or not to reimburse telemedicine, they are still costs and benefits that private insurers ignore. The government is better at recognizing these externalities because it funds telemedicine demonstration projects and seeks information not only about cost and quality, but about how the technology impacts the participants and society as a whole. The government is seeking to improve medicine not only to save money and improve quality, but to improve society in

¹⁵⁹ This can be seen both in the history of telemedicine and other health care reimbursement advancements. This phenomenon is discussed in more detail later in the paper.

an altruistic way, while private insurance companies only care about making money.

These four factors, the moral hazard problem, the superior government knowledge, the first mover problem, and the positive and negative externalities, argue in totality for Medicare setting telemedicine reimbursement policy. While the moral hazard problem may be increased if telemedicine is reimbursed, this does not mean that private insurers would be better at setting reimbursement policy. The government's superior knowledge, attributable to its ability to obtain information concerning telemedicine more quickly, and its huge monetary expenditures suggests that the government may be better at making reimbursement decisions. The first mover problem arises because of the uncertainty involved in health care and the corresponding risk of being the first insurer to reimburse telemedicine. The government is in a better position to bear this risk because it is in a less competitive environment than private insurers. Therefore, the first mover problem suggests that Medicare should set telemedicine reimbursement policy. The government is probably also better at recognizing and incorporating positive and negative externalities into their decision making process because the government has some altruistic motives and therefore cares more about the externalities than a private insurer who is more concerned with how a certain policy will affect its bottom line. All of these factors point toward a government decision-maker, such as Medicare, setting telemedicine reimbursement policy.¹⁶⁰

Even if one still thinks that the market should set telemedicine reimbursement policy, history argues against such a result. Medicare is the historical leader in setting American health care reimbursement policy. For instance, after Medicare first adopted a policy of hospital payment based on diagnostic-related groups (DRGs)¹⁶¹ in the 1980s, a Rand Corporation survey determined that about two-thirds of Blue Cross Blue Shield (BCBS) plans quickly followed suit, as did twenty-

¹⁶⁰ This is not to suggest that private insurers must race to follow Medicare policy, and in fact, they should not be forced to do so. Rather, it suggests that because of first mover problems someone needs to take a step forward to test the quality and cost-effectiveness of telemedicine by reimbursing services where there is some evidence of such positive effects. Medicare should be this leader.

¹⁶¹ When a patient is admitted to a hospital they are assigned a DRG depending on their diagnosis. "The payment for a patient within any DRG varies somewhat by region and hospital type . . . but from the hospital's point of view, the price per *admission* is fixed. The hospital in most cases receives the same revenue from Medicare no matter what is done to the patient during the hospital admission or how long the patient stays in the hospital." Phelps, *supra* note 149, at 419.

one state Medicaid programs.¹⁶² Similarly, after Medicare implemented a scale of values known as a resource-based, relative value scale (RBRVS)¹⁶³ in 1992, nineteen of twenty-four BCBS plans began using systems based on RBRVS.¹⁶⁴ The same phenomenon has been taking place in telemedicine reimbursement policy. Private insurers that are beginning to cover telemedicine services are adopting many of Medicare's reimbursement restrictions. For instance, BCBS of Texas does cover some telemedicine services, but does not cover "telemedicine services billed for the use of a telephone or fax machine."¹⁶⁵ This coverage policy became effective January 2002 and mimics federal telemedicine coverage policies that became effective in November of 2001.¹⁶⁶ The timing suggests that BCBS of Texas voluntarily changed their coverage policy to mimic Medicare's coverage policy. States have also followed Medicare's lead. Kentucky's statute requiring telemedicine reimbursement excludes from this requirement services "provided through the use of an audio-only telephone, facsimile machine or electronic mail."¹⁶⁷ Therefore, history shows that Medicare really is a policy leader when it comes to health care reimbursement issues.

Medicare should be the policy leader in setting telemedicine reimbursement policy. The private market may not be as good at setting reimbursement policy due to the moral hazard problem, the government's superior information about telemedicine, the first mover problems, and private insurers' inability to recognize all of the positive and negative externalities associated with telemedicine reimbursement. History supports this assertion showing that Medicare has proven to be a successful leader in reimbursement policy in the case of DRGs, RBRVS, and more recently telemedicine.

¹⁶² Press Release, Department of Health and Human Services, Medicare Payment Methods Used by Private Insurers, Medicaid (Sept. 28, 1994) [hereinafter Medicare Payment] at <http://www.hhs.gov/news/press/pre1995pres/940928.txt>.

¹⁶³ The RBRVS system develops "a series of relative values of various procedures performed by physicians and surgeons The underlying logic of the methods used by the RBRVS study was to produce what might be called 'equal pay for equal work,' or to pay physicians according to the time and complexity of their effort equally, whether the task at hand was neurosurgery, psychiatric consultation, or removal of warts." Phelps, *supra* note 149, at 428-29.

¹⁶⁴ A study measuring this effect was conducted by Health Economics Research Inc. See Medicare Payment, *supra* note 162 (discussing the impact of Medicare's payment methods on hospitals and physicians).

¹⁶⁵ Blue Cross Blue Shield of Texas, *supra* note 46.

¹⁶⁶ 66 FED. REG. 55,246, 55,330-31 (Nov. 1, 2002).

¹⁶⁷ KY. REV. STAT. ANN. § 304.17A-138(1)(b) (2001). The same is true of the Colorado law. COLO. REV. STAT. § 10-16-123(3) (2002).

C. Proposed Changes to Medicare Reimbursement Policy

This section explores some of the areas where Medicare's telemedicine reimbursement policy is lacking. It addresses the shortfalls in telemedicine reimbursement policy, particularly the lack of store and forward reimbursement and the geographical reimbursement restrictions, and makes suggestions to correct the current reimbursement policy.

One fault of the Medicare reimbursement policy is that it does not currently reimburse store and forward technology outside of demonstration projects conducted in Alaska and Hawaii even though store and forward technology is one of the few telemedicine services that has been shown to be cost effective. As the data confirming the cost effectiveness of store and forward telemedicine technology is consistent, reliable and public, the decision not to reimburse store and forward services does not make sense. When confronted with this criticism a few years ago, CMS responded in the Federal Register that it did not have the authority to cover store and forward technology.¹⁶⁸ However, Congress specifically requires the Secretary of Health and Human Services to establish a process for adding telemedicine services to the list of reimbursable services.¹⁶⁹ Until recently, such a process had not been established.¹⁷⁰ The reason for this is not clear.

¹⁶⁸ "The law provides for the use of asynchronous, store and forward technologies for delivering telehealth services only for telemedicine demonstration projects conducted in Alaska or Hawaii. We do not have the authority to expand the use of store and forward technology in delivering telehealth services." Revisions to Payment Policies, 66 FED. REG. 55283.

¹⁶⁹ The Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 defines "telehealth service" as any "professional consultations, office visits, and office psychiatry services . . . and any additional service specified by the Secretary." 42 U.S.C. § 1395m(m)(4)(F)(i) (2000). In addition, the Act mandates that the Secretary of Health and Human Services "establish a process that provides, on an annual basis, for the addition or deletion of services (and HCPCS codes), as appropriate, to those specified in clause (i) for authorized payment under paragraph (1)." 42 U.S.C. § 1395m(m)(4)(F)(ii) (2000). Therefore, CMS does have the authority to reimburse store and forward technology as soon as they develop a process for adding this service to the list of telehealth services that are reimbursable.

¹⁷⁰ As of November 1, 2001 such a process had not been established. *See* Medicare Program, Revisions, 66 FED. REG. 55283 ("We will use these comments and suggestions to assist us in establishing guidelines for a telehealth coverage process and the addition of specific telehealth services that may be appropriate for Medicare beneficiaries. However, we do not believe it would be appropriate to expand the scope of telehealth services beyond the services explicitly listed in the Act until we have a process in place for adding new telehealth services"). Recently, however, CMS established such a process. Centers for Medicare & Medicaid Services, Telehealth: Process for Adding or Deleting Services to the List of Medicare

Perhaps Medicare feared fraud and abuse or overuse, or maybe Medicare had difficulty establishing an appropriate procedure. Medicare, through its new process, does have the power to reimburse store and forward technology and it should do so.

A second fault of Medicare's telemedicine reimbursement policy is the failure to reimburse patients who do not live in a rural or non-MSA area. While this coverage limitation seems to make sense in light of some of the research that is available, particularly the cost-effectiveness studies, telemedicine services should not be reimbursable solely within certain pre-determined geographic locations. Exceptions should be made in certain circumstances. For instance, a patient that lives in a metropolitan area should be reimbursed for telemedicine services if they are more cost-effective than transporting that patient to specialists elsewhere.¹⁷¹ Without exceptions like these, telemedicine reimbursement policy seems arbitrary. Therefore, telemedicine reimbursement policy should allow for reimbursement in non-traditional telemedicine cases that are likely to produce cost savings and increase quality of care.¹⁷²

Medicare can and should fix these flaws in its current telemedicine reimbursement policy. Store and forward technology should be covered because empirical studies have shown that it is one of the most cost-effective telemedicine services available. In addition, Medicare should make exceptions to its strict geographic restrictions on telemedicine reimbursement because there are certain situations in which reimbursing an urban patient's use of telemedicine may result in both cost savings and quality improvement.

V. CONCLUSION

To date, reimbursement has proved to be a formidable barrier to the growth of telemedicine. While Medicare has expanded its telemedicine coverage, there are still geographical restrictions on

Telehealth Services (last modified March 21, 2003) at <http://www.cms.hhs.gov/physicians/telehealth>

¹⁷¹ In fact, most urban facilities would already have access to telemedicine equipment because they would need it to service rural patients. Therefore, allowing urban patients to take advantage of these resources would seem to be an inexpensive measure that could greatly improve quality of care.

¹⁷² One could imagine that this could implicate the rules versus standards literature. Addressing the rules versus standards debate, however, is outside the scope of this paper. For further information see, e.g., Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 *Duke L. J.* 557 (1992); Pierre Schlag, *Rules and Standards*, 33 *UCLA L. REV.* 379 (1985).

