

Clinical Inquiry Project

Broadband Use for Telemedicine in Oregon's Federally Certified Rural Health Clinics

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Abstract

This clinical inquiry project focused on qualitative data about the use of broadband, for live video telepsychiatry, to increase access to health services for clients of federally certified Rural Health Clinics (fcRHCs). Quantitative data about the clinics characteristics was used to augment the qualitative data. It is necessary to specify that the focus was on federally certified Rural Health Clinics, not clinics located in rural areas. The problem, the population affected, the epidemiology of the affected population, and the purpose of studying broadband in Oregon's fcRHCs was presented. The literature was reviewed to justify the inquiry. Issues of policy, equity, access, and the ethics were addressed. The project required all the skills learned as a Doctor of Nursing Practice student. The project was designed on the assumption that the fcRHCs connected to broadband were engaged in telemedicine. The finding were that of the six (out of 60) fcRHCs connected to the national broadband in the spring of 2012, none were engaged in telemedicine. Although some clinics had begun to inquire into telemedicine, none of them were ready to implement a telemedicine program.

Introduction to the Problem

Description and Significance of the Problem

The problem.

The problem was a lack of knowledge about Oregon's federally certified Rural Health Clinics (fRHCs) connectivity and implementation of the 2009 National Broadband Plan (NBP) for live video telemedicine, specifically for telepsychiatry, which is the easiest program to implement. At the mesosystems level, national policy created the NBP to bring broadband to rural areas in an effort to answer the nations' pressing need to decreasing healthcare cost and improving health outcomes. Broadband complimented earlier efforts to increase access to healthcare in rural areas with fRHCs. At the microsystems level the purpose of implementing live video telemedicine/telepsychiatry in federally supported RHCs would be to provide access to quality affordable services not available locally; but it was not known whether fRHCs in Oregon employed broadband for telemedicine/telepsychiatry.

Significance of the problem at the national level.

One of the most daunting tasks the nation faced in the second decade of the 21st century was controlling the persistence of poor outcomes and healthcare disparities despite skyrocketing healthcare spending (FCC, n.d.a). Public policy cares about innovations like telemedicine/telepsychiatry because public funds heavily subsidize Medicare, Medicaid, and the infrastructure to support service delivery, especially to rural areas (Vittacca, Mazzu, & Scalvini, 2009). The Rural Health Clinics Act of 1977 had already attempted to increased access to health care for recipients of federally funded Medicare and Medicaid programs in rural physician shortage areas by using Nurse Practitioners or Physician Assistants 50% of the time that fRHCs were open (Department of Health and Human Services Center for Medicare and Medicaid Services, 2013;

Rural Assistance Center (RAQ), 2013). Policies shaped telemedicine as a solution to the persistence of inequitable rural access and escalating cost (FCC, n.d.a). The challenge for rural areas is the delivery of just and equitable care without dangerous delays (Fleming et al., 2009; García-Lizana & Muñoz-Mayorga, 2010). Broadband connections are a vehicle to address inequity by reaching vulnerable and special needs clients who live in rural areas (Palmer et al. 2010). Broadband connectivity was expected to be the foundation that allowed tracking of public health trends necessary for the transform the nation's health care system (FCC, 04/09/12b). Broadband connections would provide virtual links for all aspects of healthcare, thus becoming as vital to the nation as the highway system (Tracy, Rheuban, Waters, DeVany, & Whitten, 2008). Broadband was heralded as enabling the exchange of a new commodity, knowledge sharing, which is essential to equalize access to information and services (Broadband Commission for Digital Development, Geneva 25th October 2011).

Broadband was priced too high for small practices and rural clinics, or was inadequate for the needs of medical information technology (National broadband plan by issues: Health care, n.d.). The government estimated that about one third of the fCRHCs could not afford secure and reliable broadband services (Monegain, 2012). Broadband for rural areas started with the Rural Health Care Pilot Program (RHCPP) of 2007 which supported rural areas by subsidizing 85% of the construction cost of a nationwide broadband network dedicated to healthcare (FCC, 2010). The Rural Healthcare Pilot Program improved healthcare by connecting public and private, urban and rural, health care facilities (FCC, n.d.a); these connections were vital because rural areas contain 60% of the Health Professionals Shortage Areas (HPSAs)-(see Appendix A for a map of Oregon HPSAs) (Miller, 2011; Rural Assistance Center, 2011; Office of Shortage Designation Bureau of Health Professions, 2012, May 8; Sawyer, Gale, & Lambert, 2006). Live

video telemedicine and health information technology requires broadband connectivity capable of rapid transmission of large amounts of data. Transmission over the fiber optic broadband line ensures confidential and medically privileged consultation.

Significance of the problem in Oregon.

The NBP and fcRHC's were created for the same purpose, to improve access to health care for rural residents, especially those insured by federal Medicaid and Medicare monies, so it would be expected that Oregon's fcRHCs with broadband access would be engaged in some form of telemedicine/telepsychiatry. However, it was difficult to identifying whether the broadband connected to fcRHCs was used for live video telemedicine/telepsychiatry or how successfully the programs were delivering care to the Medicaid and Medicare population.

In the spring of 2012, 38 rural clinics were connected to the Oregon Health Network (OHN) who administered Oregon's portion of the NBP (OHN, 2012). The OHN site did not list to what purposes the rural clinics were employing broadband. Further, the OHN site did not distinguish fcRHCs from other rural clinics; cross examination revealed that only six of Oregon's 60 fcRHCs (see Appendix A) were on the list (OHN, 2012). OHN cannot be faulted for the confusion over the term rural clinic as even the FCC (04/09/12a) acknowledged that a rural health clinic could mean a small hospital clinic, a medium-sized physicians' clinic, or a clinic in a rural area. By the census definitions, 80% to 90% of Oregon's land mass is rural (Crandall & Weber, 2005); thus, the majority of clinics in Oregon are rural clinics, but not necessarily fcRHC's. The Rural Health Services Act of 1977 specifies that fcRHCs must be located in non-urbanized area, and designated as one or more of the following: a Health Professional Shortage Areas (HPSAs), a Medically Underserved Area (MUSA), or an area designated by the state's governor as medically needy (RAC, 2012; Young, Valley, Soenen,

Johnson, & Ong, 2011). It is common for fcRHC's to drop the federal certification designation and refer to themselves as Rural Health Clinics.

Population affected.

This project targeted fcRHCs and the rural populations they serve, with a focus on the subpopulation of rural clients with mental health needs. Although 80-90% of Oregon's land mass is rural, only 20-30% of the population lives in rural areas with the other 80% clustered in six population centers (Crandall & Weber, 2005; Truffer, Klemm, Wolfe, & Rennie, 2010).

Epidemiology.

In the 1970's, aging baby boomers began migrating to rural areas (Fleming, Edison, & Pak, 2009; Johnson, 2006). Rural populations between the ages of 55 and 75 will increase by two-thirds by 2020 (Cromartie & Nelson (2009). By 2030, the percentage of Oregonians over age 65 years is expected to be 18.25% with implications for increased demands on healthcare and its infrastructure (Etuk, 2008). The health cost of chronic disease for those over 65 years of age is three times greater than for the rest of the population (Vitacca, Mazzu & Scalvini, 2009). Rural areas have a larger population of indigent and the Medicare/ Medicaid population (Singh, Mathiassen, Stachura, & Astapova, 2010). The demand for healthcare in rural areas is expected to accelerate in response to the Medicaid expansion of 2014 (Truffer et al., 2010). The eligible Medicaid population will have a higher mean age and more disability therefore they are likely to have more expensive health care needs (Natoli, Cheh, & Verghese, 2011). Medicaid is the largest payer for mental health services, which are the most expensive and have the greatest consequences in terms of losses to societal function (Gustafson, Preston, & Hudson , 2009).

Mental health disorders tied with cancer as the fourth most frequent diagnosis on rural hospital discharges, but access to mental health services may not be available in many rural areas

(Bellamy, Bolin, & Gamm, 2011). Rural areas suffer because 85% of the mental health professional shortages exist in rural areas (New Freedom Commission on Mental Health, 2004). In states like Oregon, there are entire counties with no practicing mental health professionals (Oregon Office of Rural Health, 2009a; Oregon Office of Rural Health, 2009b; Oregon Office of Rural Health, 2009c). See Appendices C, D, and E for maps of shortages of psychiatrists, psychologists, and clinical social workers in Oregon. One in five children has a mental health diagnosis with no access to mental health care (Ulzen, Williamson, Foster, & Parris-Barnes, 2012). Rural areas especially lack access to child and adolescent psychiatric specialists (Diamond & Bloch, 2010; Grady et al., 2011). The lack of access to mental health professionals results in a rural suicide rate three times higher than in urban rates (Hilty, Nesbitt, Kuenneth, Cruz, & Hales, 2007). Improving access to mental health services to assure the health and wellbeing of fcRHC clients, for whom the government has assumed responsibility, is critical (Shekar, 2005).

It is estimated that at least 50% of mental health care is provided by PCP's, resulting in a what Regier, Goldberg and Taube (1978) dubbed as the de facto mental health system. Other sources indicate that 60% of mental health is carried out by PCP's because clients perceive care in the mental health sector as inadequate (Hilty, Yellowlees, & Nesbitt, 2006a; Hilty et al., 2008; Szeftel et al, 2011; Ulzen, et al., 2012). Rural clinicians are faced with caring for and treating complex child psychiatric conditions that even adult psychiatric providers refuse to treat because they lack the specialty training (Szeftel et al., 2011). Primary care providers (PCPs) lack the specialty skills to treat the complex co-morbidities of children with developmental delays living in rural areas (Hilty, et al., 2006b).

If rural providers are providing mental health services, it makes sense to integrate telepsychiatry into primary care in fCRHCs. Lando Williams, Williams & Sutgis (2006) laid out a model of the complexity of disease prevention which emphasizes how fundamental mental health is to clients maintenance of physical health, and how that wellbeing radiates to family and community. Recognition of the integral link between mental and physical health is reason to advance the integration of mental health into primary care; telepsychiatry is one approach to connect patients, providers, and specialist (Thielke, Vannoy, & Unutzer2007). Whitten, Adams, and Davis (2003) detail how they successfully integrated telehealth throughout their organization on a needs based basis. Whitten et al., (2003) make an important point: in rural areas small numbers make it hard to demonstrate the impact integrated telehealth has for clients, clinicians and administration; the steady growth in the number of activities and uses of telemedicine are better measures of success. Healthcare reform has moved toward measuring the quality of life and the public health burden, perhaps these measures would more accurately reflect the efficacy and cost-effectiveness of telemedicine.

Access issues have driven the push for the use of telemedicine, especially telepsychiatry (Grady et al., 2011). Telepsychiatry is often recommended as the first telemedicine application. Telepsychiatry requires minimal hardware investment, needs only cameras and screens, and does not require hands-on touch or other diagnostic equipment (May et al., 2003; Toperczer, 2011). Broadband for live video telepsychiatry in rural areas offers solutions to equitable access to mental health care (Shekar, 2005). Telepsychiatry has been in use for over 50 years; it would be expected to be a mainstream rural practice, yet it remains a minimally implemented subspecialty of healthcare delivery (FCC, 04/09/12a; FCC, 04/09/12b; Tschirch, 2006). Broadband

connections are a vehicle to address inequity by reaching vulnerable and special needs clients who live in rural areas (Palmer et al. 2010).

Implementation of telemedicine requires all the skills of Doctors of Nursing Practice because of the complex interactions between health care systems, policies, politics, ethics, and the economics of technologic innovation and resource distribution required to implement access to healthcare. Telehealth technology has the potential to supplement and augment the ability of Advanced Practice Nurses to achieve their full potential through consultation with patients as well as other healthcare providers (Armer, 2003; Jenkins & White, 2003; Tschirch, 2006).

Purpose of the project.

The purpose of this project was to identify facilitators and barriers to using broadband for live video telemedicine, specifically for telepsychiatry, in the six fcRHCs listed as connected to broadband in Oregon during the spring of 2012. The aim of this project was to use in-depth interviewing of key stakeholders in the six fcRHCs. The question was: how are the six Oregon fcRHCs using their broadband connections; what are the barriers and facilitators, as well as expectations, influencing the adoption of broadband technology for telemedicine, especially telepsychiatry services, in Oregon's fcRHCs? The desired impact would be to learn about the barriers and facilitators that would potentially help other fcRHCs with their live video telemedicine programs, as well as inform policy makers about the unique needs of fcRHCs.

Review of the Literature

To gain an understanding of the issues involved, a literature search was undertaken to identify the known barriers and facilitators to integrating mental health into fcRHCs through the use of live video telepsychiatry. Terms that guided the literature search included telemedicine; rural health clinic and telepsychiatry; telepsychiatry; telepsychiatry and implementation and rural

health centers (an EBSCO category) or rural health clinics; telemedicine and primary care; telepsychiatry and primary care; normalization of telemedicine; adoption technology, models for adoption; Advanced practice nursing and telemedicine; live-interactive video; ethics and telemedicine/telepsychiatry. Reference lists were searched for primary sources and new leads. It was necessary to search further for information that was referenced in the literature, such as rural definitions and sources of facts. Search engines included Pub Med, Scopus, Gale, Academic One, SciVers, EBSCO, OVID, and Cochrane Library. Limits on searches included: the last 10 years (2002-2012), English language, peer reviewed journals, research or research-related reports, live- interactive video, and in the USA. The search excluded: telemedicine by telephone or “store and forward” technology; programs located in rural hospitals, prisons, community health centers, mental health clinics, and inpatient settings; programs for emergency services in rural communities, nursing homes, home care, and hospice; service to special populations of veterans, Indian reservations, and school/university/students; and uses for forensics and court testimony.

State of the relevant literature.

An abundance of literature from around the world on rural telemedicine exists but few articles were from the rural United States. Of the articles reviewed for this project, 16 specifically dealt with rural telemedicine issues. Thirteen literature reviews were examined: five reviews addressed various aspects of telemedicine (Heinzelmann, Williams, Lugn, Kvedar, 2005; Hersh et al., 2006; Leach, 2009; Schlachta-Fairchild, Elfink, & Deickman, 2008; Whitten et al., 2003; Wootton, Bahaadinbeigy & Hailey, 2011); seven reviews were specific to telepsychiatry (Benavides-Vaello, Strode & Sheeran, 2012, GarcAa-Lizana & Muaoz-Mayora, (2010); Glueck, 2011; Hilty, Liu, Marks, & Callahan, 2003; Hilty et al., 2004; Hylar & Ganure, 2003; Monnier,

Knapp, & Freuh, 2003). Only Benavides-Vaello, Strode and Sheeran (2012) specifically addressed rural issues. Grady et al., (2011) published evidence based guidelines for telemedicine without specific mention of rural issues. Two Randomized Controlled Trials by McConnochie et al. (2006) and Mitchell et al. (2008) dealt with efficacy in specific situations not specific to rural. Nine articles on telepsychiatry were specific to rural needs (Chung-Do et al., 2012; Grubaugh et al., 2008; Helm, Koyanagi, Else, Horton & Fukuda, 2010; Hilty, Nesbitt, Kuenneth, Cruz & Hales, 2007; Hilty, Yellowlees, & Nesbitt, 2006a; Hilty et al., 2006b; Savage et al., 2012; Singh, Mathiassen, Satachura & Astapova, 2010; Thomas, Miller, Hartshorn, Speck & Walker, 2005; Ulzen, Williamson, Foster, Parris-Barnes, 2012). The bulk of the articles were case reports and opinion arguments related to telemedicine or telepsychiatry and rural issues. Telemedicine in relation to fcRHCs was rarely mentioned.

Overall, the evidence for telepsychiatry benefit was positive, but the research was fraught with methodology problems. The sample sizes are small, typically descriptive, and measures are not generalizable or repeatable (Bishop, O'Reilly, Maddox, & Hutchinson, 2002; Grubaugh, Cain, Elhai, Patrick, & Frueh, 2008; Hilty et al., 2007; Rowe, Gibson, Morley, & Krupinski, 2008; Toperczer, 2011). Economic studies are not conducted by economists making it difficult to compare data (Heinzelmann, Williams, Lugn, & Kvedar, 2005). Hersh et al., (2006) rated the quality of the studies as low, lacking heterogeneity, with few controlled studies to make conclusions about clinical outcomes. Large gaps in knowledge about the use of telepsychiatry exist due to the lack of rigorous studies; considering the wide spectrum of potential applications, these studies will not be completed for some time (Hyler & Gangure, 2005).

Hilty et al. (2003) reviewed the literature from 1965 to 2003 and concluded that telepsychiatry was as reliable and as satisfactory as face-to-face care. Telepsychiatry provided

complete diagnosis, as well as the opportunity to evaluate access, quality of care, and cost (Vitacca, Mazzú, & Scalvini, 2009). One controlled study found that the efficacy of cognitive behavioral therapy for bulimia delivered by telemedicine was comparable to face-to-face therapy (Mitchell et al., 2008). Five controlled studies of telepsychiatry from the United States found no complications for clients treated through this medium, and confirmed findings for its feasibility and effectiveness; lacking contrary evidence, it is therefore assumed that telepsychiatry is safe (Garcí-Lizana & Mayorga, 2010). Satisfaction with telepsychiatry was found to be high for clients, especially for rural client's, whose attitude was that access to some care was better than no care (Bishop et al., 2002; Grubaugh et al., 2008; Hilty et al., 2007; Mitchell et al., 2008; Rowe et al., 2008; Toperczer, 2011).

Telepsychiatry offered many benefits for clients, providers, and the community. Mental health services in rural communities eliminates long travel times to appointments, there is less absenteeism from work/school and the dollars that would have been spent on travel stay local, thereby yielding potential economic benefit to the community (Chung-Do et al., 2012; Hilty et al., 2008). Telepsychiatry enables collaboration that extends to the community allowing school personnel, caretakers, and extended family, that normally would not be able to travel to appointments, to participate in the care of clients (Hilty et al. 2003; Hilty, Yellowlees, & Nesbitt, 2006a; Palmer et al., 2010). Access to specialists via telepsychiatry permits clients to receive ethnocultural care (Chung-Do et al., 2010; Hilty, et al., 2006b; Savin, Glueck, Chardavoyne, Yager, & Novins, 2011; Yellowlees, Marks, Hilty, & Shore, 2008), appropriate pharmacogenetic care (Hilty et al., 2003), and it empowers clients through a choice of who provides care, as well as when, where, and how quickly (Chung-Do et al., 2010; Hilty et al., 2003; Kaplan & Litewka, 2008).

Telepsychiatry additionally improves the professionals' access to each other for consultation and discussions about clinical cases, as well as for continuing education and development (Chung-Do et al., 2012; García-Lizana, & Muñoz-Mayorga, 2010; Heckner & Giard, 2005; Hilty, Marks, Urness, Yellowlees, & Nesbitt, 2004; Sulzbacher, Vallin, & Waetzig, 2006; Szeftel et al., 2011). Telepsychiatry provides opportunities to train healthcare professionals who live in rural areas, thereby serving an important role for workforce recruitment and retention (Chung-Do et al., 2012). Telepsychiatry allows instructors to monitor live video of residents and patients interactions (How Aptius Works, 2013). Telemedicine/telepsychiatry has provided urban students with clinical experiences that expose them to the unique needs of rural clients, rare and chronic diseases, and case management for rural children with special needs (Robinson, Seale, Tiernan, & Berg, 2003).

Organizations benefit from telepsychiatry by not having to pay the non-reimbursable cost of transporting professionals to the rural clinical site (Berman & Fenaughty, 2005; Toperczer, 2011). Live-video consultations via broadband were estimated to potentially save over \$1 billion simply by avoiding unnecessary transportation of clients and providers (FCC, 04/09/12b). Offering more services increases the number of clients served, and the no-show rate is usually lower than that for face-to-face appointments (Leigh, Cruz, & Mallios, 2009). Telemedicine/telepsychiatry generate revenues, and organizations can market themselves as offering both clinical and technical excellence (Berman, & Fenaughty, 2005; Leigh et al., 2009; LeRouge, Bengisu, & Forducey, 2010; Toperczer, 2011). Telecommunications enable collaboration, care coordination, organizational reform, and professional performance feedback that creates innovations and solutions to inequity in health care (FCC, 04/09/12a; Whitten, Holtz, Krupinski, & Alverson, 2010a). Broadband connections across time and distance carry the potential to

increase access to health care, address inequities, improve outcomes, control health care cost, improve client safety, engage and empower the recipients of care, as well as spur entrepreneurs to innovate better ways to provide healthcare (Tracy, et al., 2008). The promise of telemedicine was to increase access to care while improving safety and cost such that the return on investment would ripple through communities and ultimately improve the nation's health (FCC, 04/09/12; Khazan, 2011; Hilty, Liu, Marks & Callahan, 2003; Tracy et al., 2008).

Ethical concerns related to telemedicine/telepsychiatry.

Contrary to all the excitement about the potential for telemedicine, ethical concerns appear to have contributed to a hesitancy to adopt and utilize the technology. The unwillingness of providers, and even clients, may be secondary to the fear, burden, and intrusion of technology in ones' life that overwhelms them and discourages use, especially when one lacks the technical skill (Fleming et al., 2009). The culture of being rural, and perhaps even in poverty, diminishes exposure to technology; therefore, clients may have less ability to use it and fewer expectations that its use will improve healthcare outcomes (Rabinowitz, Brennan, Chumbler, Kobb, & Yellowlees, 2008). The burden and cost of sustaining the technology with limited technical support can result in underutilization and lack of access that further the existing inequities and attendant ethical concerns (Fleming et al., 2009; Singh et al., 2010).

Telemedicine/telepsychiatry can potentially or inadvertently ration care by limiting choice to fewer providers (Fleming et al. 2009; Singh et al., 2010). Healthcare providers' unwillingness to engage with technology potentially denies or restricts access to mental health services for those in need of them (Tschirch, 2006; Whitten & Holtz 2008a). The central placement of telemedicine units in healthcare facilities can create unjust barriers by requiring clients and providers to come to the location of the equipment for care (Berman & Fenaughty,

2005; Mackenzie & Sakel, 2011). Questions about justice and the appropriateness of resource utilization are raised when healthcare systems implement technology with the intent to reap profit rather than benefit the client (Fleming et al., 2009). Insurers and the public worry that the existence of the technology will promote increased utilization of resources/services and thereby drive up costs instead of containing them (Hylar & Gangure, 2005).

The use of technology creates ethical concerns. Providers fear that technology interferes with eye contact and the lack of touch depersonalizes care (Hylar & Gangure, 2005). Advanced Practice Nurses have concerns about patient safety, patient adherence to care, concerns about infringements on patient privacy and whether confidentiality can be maintained (Schlachta-Fairchild, Elfrink & Deickman, 2008). Clients fear that technology has the potential to breach confidentiality thru insecure transmissions, or the hearing and viewing of a visit or image without client consent (Kaplan & Litewka, 2008; Nelson, 2010). Private fiber optic broadband lines combined with encryption are encouraged, but Skype is free, works on any laptop, and is easy to install and use. However, Skype may be accessed for law enforcement purposes (Skype Privacy Policy, 2012). Heidesch (2011) pointed out that Skype security was further compromised because the program sends the files through other computers where studies have shown that the average programmer can track and find information about individuals. In the end the responsibility for the client's care still rests with the primary provider who requested the consultation (Fleming et al., 2009; Rutenberg & Oberle, 2008).

Technology brings new ethical practice considerations. There is a risk that both the provider and client may consider the video consultation as comprehensive, and not consider the importance of follow-up for physical exams and in-person care (Fleming et al., 2009; Nelson, 2010). The ethics of using technology is not unique to video consultations or telepsychiatry; the

ethical use of technologic tools is expected to be part of healthcare professional's comportment. On the other hand, the potentials for using broadband communications to address the maldistribution of healthcare providers and improve healthcare are so compelling that it becomes a moral and ethical imperative to engage in telecommunications for healthcare purposes (Fleming et al., 2009). The provider must remember that the use of technology is not the practice, but a tool to be used to benefit the client (FCC, 04/09/12a; Fleming et al., 2009).

Facilitators to telemedicine/telepsychiatry (what is needed for change).

Valuing telemedicine/telepsychiatry programs for market demand must be targeted to the unique needs and perceptions of the user (LeRouge, Bengisu, & Forducey, 2010). A crucial determinant to adoption of telemedicine is the perceived advantages to the user (Zanaboni & Wootton, 2012). Rural providers value technology as a way to reduce barriers to care, such as the high cost of face-to-face psychiatric care (Berman & Fenaughty, 2005). Rural practitioner's value of telemedicine programs is greater than its value to urban consultants who perceive little value to changing their practice (Hilty et al., 2007). Nurses perceive more value in telemedicine than do physicians (Whitten, Sypher, & Patterson, 2009). Nurses value telemedicine because they have been using various forms of it for years, from telephone to home monitoring, to make a difference in the health and outcomes of clients (Hilty et al., 2008). Advanced Practice Nurses (APNs) have used video conferencing equipment for consultations, physician supervision, mentoring, and group meetings, all of which can help decrease rural APNs sense of isolation (Jenkins & White, 2001). Differences have been found between urban and rural clients in their attitudes about the value of telepsychiatry. For the rural group, even if telepsychiatry was not perceived as superior care, they were "extremely" likely to use it if it would save a two-hour drive (Grubaugh, et al., 2008).

Barriers to telemedicine/telepsychiatry

The most commonly cited barrier to videoconferencing telepsychiatric services is lack of reimbursement (Doarn & Merrel, 2009). Medicare reimbursement for telemedicine services was authorized in 1997 and expanded in 2000, but still defined by geography, the origination site (which does include fcRHCs), and eligible services. Medicare policy allocates \$24 to the originating site, while 80% of the charge goes to the consultant (Gustafson et al., 2009); yet the expensive transmission equipment costs are born by the clinic originating the transmission. State policies govern Medicaid payments. Oregon's Medicaid policy is one of 35 states that reimburses for telemedicine services; however, Medicaid managed care providers do not have to reimburse unless a telemedicine clause was specifically negotiated in the managed care contract (Brittain, n.d.). The fee-for-service providers eligible for mandated reimbursement were only 15% of Oregon's Medicaid market (Telehealth Alliance of Oregon (TAO), n.d.). Until the rule was clarified in 2012 (Medicare Learning Network, 2012), telepsychiatry reimbursement was denied because fcRHCs policy specified the consultant had to be onsite (Hilty et al., 2008). In 2012 policy specified that telehealth services may be reimbursed even though the practitioner is not on the same site as the beneficiary (Department of Health and Human Services Center for Medicare and Medicaid Services, 2012).

Misaligned policies create key barriers to broadband adoption (FCC, 04/09/12b). Policies are often developed by lay legislators who lack the experience to understand the implications of their decisions, furthering misalignment of policy (Grigsby et al., 2002). The policies promoting the value of broadband communication are misaligned with who should shoulder the responsibility of paying for the technology and outcomes (Hilty et al., 2008; National Broadband Plan by issues: Healthcare, .n.d.; Jennett, & Watanabe, 2006). For rural

practices the value of real-time consultations may not match their ability to sustain the program without subsidization (Gamble, Savage & Icenogle, 2004). Viewed from a societal perspective, telemedicine decreases redundancy and duplication while improving prioritization, which results in efficacy and better use of resources (Vittacca et al., 2009; Berman & Fenaughty, 2005). Small practices could share resources, administrative support, on-call coverage, and coordinate care to meet the requirements of Medical Homes (Abrams, Schor, & Schoenbaum, 2010). Overall, there is societal benefit, but it accrues unequally. It can be cost prohibitive for the provider, who bears the expense of the technology implementation and the battle for reimbursement, whereas the client saves time and travel and has improved continuity of care with the attendant improved health outcomes, while the insurer, who reaps the benefits of improved health outcomes, fears that increased utilization will result in rising costs (Hilty et al., 2008; Hyler & Gangure, 2005; Krupinski, et al., 2006).

Telemedicine advocates argue that payors should leap at the evidence of good outcomes in 21 different specialties that have proven the value of telemedicine to improve healthcare delivery (Leach, 2009, Whitten & Holtz, 2008b). Policy makers and payors cite lack of evidence for cost-benefit as reasons to not pay for telepsychiatry/telemedicine services (Berman, & Fenaughty, 2005; McGarry & Nairn, 2005). The research on the economic pros and cons of telemedicine has measured variables inconsistently and results may or may not be, generalizable to the realities of practice, leading to the conclusion that there is limited evidence of cost-effectiveness (Berman & Fenaughty, 2005). Cost analyses have typically been from the provider perspective (García-Lizana & Muñoz-Mayorga, 2010; Hersh et al., 2006; Hyler & Gangure, 2005).

Despite the push for telecommunications and telemedicine to end healthcare inequity, the benefit is still theoretical to many rural communities that lack resources to get connected (Nelson, 2010). Rural areas have small economies of scale; raw numbers of services provided look small to urban providers, but have a significant impact on the rural community (Whitten et al., 2003). Whitten, Holtz, Laplante, Alverson, and Krupinski (2010b) concluded from an independent investigation of the Broadband Pilot Plan that the benefits were equal to the potential, but the lack of coordinated integration of programs from the local to state government created few incentives and no economy of scale for sustainable telemedicine programs.

Government programs making telecommunication possible are not sufficient to reduce the barriers to its use (Broadband Commission for Digital Development, Geneva 25th October 2011). Providers are often reluctant to engage with telemedicine for many reasons; acting on old habits is more efficient (Grigsby et al., 2002), technology can bring disruptions to the office routines, lack of familiarity with technology, and lack of technical skills and support, causes them to feel overwhelmed (Fleming et al., 2009, Rabinowitz et al., 2008, Whitten, Sypher, & Patterson, 2009). Why providers fail to utilize or adopt telemedicine is a complex issue (Whitten & Holtz, 2008a). In remote and rural communities, sole practitioners often run fcRHCs; the clinic may be the only healthcare in the area, yet they are unable to afford the investment in broadband infrastructure and lack technical expertise/resources (Lamb, Klupenger, & Mitchell, 5/25/12). Provider's reluctance to use telemedicine/telepsychiatry not only creates a barrier, but places them as the gatekeepers who prescribe the visits that maintain programs (Whitten & Mackert, 2005; Holtz & Whitten, 2008a). If providers are not recommending telemedicine, clients are not aware of the benefits; therefore there is no consumer market demand (Whitten & Sypher, 2006; Whitten & Kuwahara, 2003). The provider reluctance is exacerbated by ongoing

administrative challenges over licensing and malpractice/liability issues, especially consultations from out of state or when virtual world connections are involved (Whitten & Holtz, 2008b). The technology is new and unfamiliar; no one knows what they need to do or how to do it (Whitten et al., 2009).

There is no market demand for telemedicine. Consumer demand has the potential to be a disruptive force in the market for telemedicine/telepsychiatry. In the complementary and alternative medicine market, client demand was more potent than evidence for influencing change in payers' willingness to reimburse (Whitten & Sypher, 2006; Whitten & Kuwahara, 2003). Based on the alternative market experience, the assumption is that if clients know about the benefit of telemedicine/telepsychiatry, they should drive the demand side of the market; unfortunately, clients learn about innovations through their provider prescribing it, advertisements from vendors, or the news (Whitten & Sypher, 2006; Whitten, Adams, & Davis, 2003).

Organizational factors add to the difficulty of introducing telemedicine. Adoption of telemedicine programs requires more than the technology; it is the organization's ability to disperse knowledge that translates into the necessary changes in roles and clinical practice (May et al., 2003). The research is difficult to translate into legitimate reasons to implement a telemedicine program (Grisby, 2002; May et al., 2003). Providing evidence-based information to providers who are unwilling to try telemedicine is not likely to be a motivating force because the providers may not be acting on logical or rational decisions, but rather out of habits that maintain the status quo until a disruptive force motivates change; (Grigsby et al., 2002). A champion for the project is necessary to convince the providers, and organization, of the benefits of a telemedicine program (May et al., 2003). Hierarchical organizations are able to mandate the

implementation of changes, but peers are more effective at disseminating information which results in a provider's successful adoption of new technology (Grisby, 2002). Rural areas may lack peers to convince them to adopt new ideas.

Organizations routinely underestimate the problems associated with the introduction of telemedicine (May et al., 2003). Almost half the challenges of implementing telemedicine programs result from trying to coordinate multiple organizations (Whitten, Holtz, Krupinski, & Alverson, 2010a). During the deployment of the Rural HealthCare Pilot Program there was over a 50% turnover in partners due to dropping out or changing partners (Whitten et al., 2010b). Conflicts between the fiscal needs of the administration; the provider's perception of need, and the client's willingness to pay for the program can halt the project (Aday & Andersen, 1974; Grisby, 2002; Whitten & Kuwahara, 2004). Organizational resistance to change, reluctant providers, and lack of client demand leave payors with the relative market advantage - an excess supply of programs and equipment vendors without client demand (Leach, 2009; Vittacca et al., 2009; Whitten et al., 2010b; Whitten et al., 2009; Whitten & Holtz, 2008b).

Gaps in knowledge.

The United States literature lacks details about the connectivity needs of providers in rural areas (FCC, 04/09/12a; Hilty et al., 2007; Leigh et al., 2009). The Government has invested in broadband infrastructure to incentivize measurable health care reform, yet there are gaps in connectivity, adoption, and utilization for improved healthcare outcomes (Gustafson et al., 2009). Despite efforts for telemedicine to target underserved groups and rural residents, little research has addressed the needs and outcomes of these groups (Rabinowitz et al., 2008). No literature was found that specifically addressed Oregon's fcRHCs connectivity or needs.

What is the need to improve practice or translate policy to practice?

For America to recognize the potential benefits of broadband for healthcare, it will be imperative to focus on why it has not been more widely adopted (FCC, 04/09/12a). Research is needed to explain the gap between broadband infrastructure and what provider circumstances cause the connectivity gap to persist (FCC, 4/9/12b).

Summary of the literature review.

It is clear that live video telemedicine/telepsychiatry could provide affordable, accessible, acceptable, and effective mental health services to the vulnerable populations that fcRHC's serve. Workforce shortages will increase the demand for services and consultation to fcRHCs. Broadband connectivity and video connections will enhance practitioners influence outside of traditional roles. Telemedicine/telepsychiatry offers a vehicle to expand and advance collaborative relationships and practice parameters for the benefit of clients' healthcare. As the economy struggles, and the cost of transportation outpaces fixed incomes, there is a greater likelihood that both providers and clients will choose telepsychiatry over face-to-face meetings. Organizations should begin to value the savings of improved outcomes through virtual access, early intervention, and improved health outcomes.

The potential cost-benefit to society will not accrue if the technology is not used. In fact, not using the broadband connectivity could be seen as unethical. APNs can educate clients about telemedicine/telepsychiatry to create a market demand for video consultations to be reimbursed. Once demand for live video telemedicine/telepsychiatry is established, integration into daily care is more likely, and with integration there will be motivation to solve the other policy issues that impede its use. Engagement in live video telemedicine/telepsychiatry is necessary to move from data collection to developing innovative solutions for rural health care service inequities. To recognize the potential of broadband to fcRHCs, the clinics will need to know how to facilitate

their place in the market, how to overcome barriers, and more about user expectations and demands.

II. Approach to the Conduct of the Project

Setting

The setting was in rural Oregon during the fall of 2012 and the winter of 2013. The project targeted fcrHCs because their role and function was well defined in policy. FcrHCS focus on rural populations of Medicare and Medicaid clients and require at least 50% of the services be conducted by a Nurse Practitioner or Physician Assistant. The NBP targeted telehealth programs to rural clinics; in Oregon the OHN administered the NBP. The six FQRHCs that were connected to the OHN were requested to participate in this project.

Purpose and Activities.

The purpose of this project was to interview key informants from the six clinics to describe their use of connectivity to the NBP. The focus was on expectations, facilitators, and barriers to the use of telemedicine, especially telepsychiatry in fcrHCs. Clinic managers, project champions, and others suggested during interviews, were to be interviewed using a snowball sampling technique. Clinic managers were expected to know the intricacies clinic operations and therefore would be able to identify the process of adoption of telepsychiatry/telemedicine programs, the expectations of the organization, as well as the champions and key players that lead the organization to the adoption of broadband and telepsychiatry/telemedicine. Project champions were defined as individuals who enthusiastically promoted the idea of telepsychiatry/telemedicine throughout the organization, leading to the adoption of a program (Hendy & Barlow, 2012). The champions were expected to have encountered, the facilitators and barriers associated with their fcrHCs adoption of technology and institution of a telepsych

program. Interviews were planned to be conducted in person, via video consultation, or phone. Some questions were intended to be answered through a survey on Survey Monkey, or hand delivered if the interviewee did not have access to Survey Monkey.

Organizational Systems, Individuals, and Population Readiness to Change

The Organizational Telehealth Readiness Tool, developed by the Health Telematics Unit, Faculty of Medicine, University of Calgary (2004) was used to assess organizational preparedness for engaging in telemedicine/telepsychiatry. See appendix G.

Anticipated barriers, facilitators, and challenges.

Face-to-face interviews were initially planned for data collection; however, recognizing that data collection during the winter could create travel barriers, telephones and video conferencing were considered as alternative interview methods. The distance between the six fcRHCs was another barrier to face-to-face communications and data collection. It was anticipated that if the clinics had broadband, they would have web access to the Survey Monkey. The author anticipated that her position in a fcRHC and as a Doctor of Nursing Practice student would facilitate data collection. Resources included the Oregon Office of Rural Health, Oregon Health Network, Oregon Health and Sciences University, and the Oregon Rural Practice-based Research Network. Financing the project was to be minimal except for telephone and travel expenses. It was recognized that schedules and finding the right time to interview participants could be a challenge in rural areas.

Participants/Population

Inclusion and exclusion criteria.

Inclusion criteria required federal certification as a Rural Health Clinic, and connections with the Oregon Health Network. "Rural clinics" without federal certification as a Rural Health Clinic were excluded.

Size and rational.

Surveying all 60 of Oregon's RHCs was initially considered, but advisors suggested that 60 interviews would be difficult to execute in the short time frame, therefore, the project focused on the six fcRHCs listed as connected to the Oregon Health Network during the spring of 2012.

Recruitment.

Recruitment was planned through contact with the clinic's managers via e-mail, telephone, or possibly in person. Clinic managers would then identify other key players to be interviewed. See Appendix E Recruitment Explanation. If there was no response from e-mail, an in-person telephone inquiry was planned, and if necessary a personal visit to the clinic.

Protection of the participants.

Clinics were asked for permission to identify their clinic in the results recognizing that it would be difficult to de-identify clinics despite identification as numbers and letters. In a state where each rural clinic is so unique in place and capability, those familiar with RHCs in Oregon could possibly identify a clinic in such a small sample.

Implementation Procedures.

Recruitment e-mails were sent to contacts-see appendix E. Repeat e-mails were sent as reminders. Eventually phone calls were required for responses. Interviewees were sent e-mail links to Survey Monkey to complete the Survey Questions about the Clinic, (Appendix F), and the Organizational Telehealth Readiness Assessment Questionnaire, (Appendix G). Interviewees were contacted for a date to be interviewed-see Interview Questions Appendix H. Interviews

were to be recorded, but only two recordings were useable; most of the answers to the interviews were typed and clarified with the interviewee during the interview. Several participants preferred to complete the questionnaires during the interview, and the others requested the questionnaires be sent as attachments in an e-mail. Clinic summaries from the Oregon Office of Rural Health were requested for each clinic selected to participate.

Data Collection

Data sources.

The key informants included clinic managers, a project manager, a physician, and a nurse practitioner. Only one clinic had two interviews.

Quantitative data.

A survey questionnaire, developed by the author, collected local data from each clinic including: information about the clinic, demographics of the service area, and a description of mental health care in the community, clinic utilization, and reimbursement characteristics. The survey data was used to describe and compare clinic characteristics.

The Organizational Telehealth Readiness Assessment Tool was developed by the Health Telematics Unit Faculty of Medicine University of Calgary. The tool used a six-point likert scale with 28 items for a total score of 140 that can be used in most telehealth context. The tool has been published and used frequently, but Le'gare'et al. (2010) pointed out the fact that psychometric data about the English version was lacking.

For comparison data, reports compiled by the Oregon Office of Rural Health (ORH) about each fcRHC were used. These reports of about 6 pages described the clinics service area, clinic characteristics, service area socioeconomic and demographic data, and characteristics of the workforce.

The survey questions, the Organizational Telehealth Readiness Assessment Tool, and the data from the ORH, all contained descriptive quantitative data that could be displayed in histograms, tables and charts.

Qualitative data.

Interviews explored expectations, experiences, facilitators, and barriers to using broadband for telemedicine/telepsychiatry.. The questions aimed to answer “What are the facilitators, barriers, and expectations to the use of broadband connections for telemedicine, specifically telepsychiatry?” Open-ended questions were derived from the literature, the author’s knowledge, and the model by Aday and Andersen (1974), *A Framework for the Study of Access*. The use of telemedicine is about access to care. The Aday and Andersen framework covers aspects pertinent to the scope of practice for a Doctor of Nursing Practice: health policy, health system development, at risk populations, utilization of health services, and consumer satisfaction. The framework was expected to help organize and define the description of facilitators, barriers, and expectations to the adoption of a telepsychiatry/telemedicine program that could change access to care.

Processes and procedures.

Clinics were recruited via e-mail and/or personal phone call. Several e-mails and phone calls were needed to find the correct person to interview. One clinic declined to participate but did report that they had no telemedicine program. Once interviewees had consented to participate they were interviewed by telephone. Attempts to record the conversations resulted in two useable recordings. Responses were typed and coded, then reviewed by the committee. The Survey Monkey was abandoned at the request of participants to either complete the questionnaires during the interview or send the questionnaires as e-mail links. Unfortunately,

Clinic Background Questionnaires were not completed, or not returned, by two clinics. The cost to the participants consisted of time being interviewed. The cost to the researcher included phone fees and the cost of time spent recruiting and interviewing participants.

III. Outcome Evaluation

Data Analysis

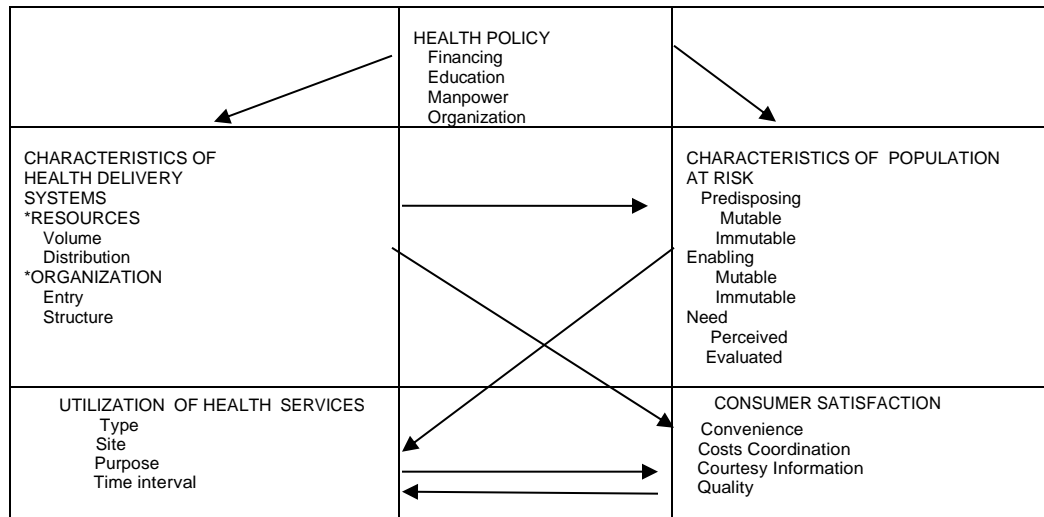
DATA COLLECTED	A	B	C	D	E	F
Clinic Background Survey	YES	YES	YES	Declined	NO	NO
Telehealth Readiness	YES	YES	YES	Declined	YES	YES
Clinic Summaries	YES	YES	YES	Declined	YES	YES
Interviews	YES	YES	YES	Declined	YES	YES

Data from the Clinic Background Survey, the Organizational Telehealth Readiness Assessment Tool, and the ORH clinic summaries were compiled into descriptive statistics. The qualitative interview responses were compiled and reviewed for important themes that emerged from the interviews. Descriptive codes, short phrases or words that summarized the idea in a pertinent segment of transcribed text were placed in an excel worksheet. The analysis team members (CIP committee members) then reviewed the text and codes looking for similarities in interpretation and discussed divergent views with the goal of creating one interpretation of the data. The list of codes developed from the review of literature was augmented and expanded after review of the coded interview transcripts.

Outcome Results

Only five clinics agreed to participate in interviews and complete the surveys. The clinic that declined to participate indicated they did not have a telemedicine program. None of the six fcRHCs in Oregon had used their connectivity for live video consults to increase client’s access to care.

The Aday and Andersen (1974) *A Framework for the Study of Access to Care* was used as a method to organize and categorize themes and sub-categories of the facilitators, barriers, and expectations about the implementation of broadband for telemedicine/telepsychiatry in fcRHCs.



Aday, L.U. & Andersen, R. (1974). A framework for the study of access to care. *Health Services Research*, 9(3), 208-220.

Health policy.

Participants did not mention health policy directly. However, several indicated that policy changes with healthcare reform had taken priority over the development of a telemedicine program. This project was done during the beginning of Oregon’s healthcare transformation and implementation of the Affordable Care Act; during this time policies were pushing clinics to make multiple changes.

Financing and policy.

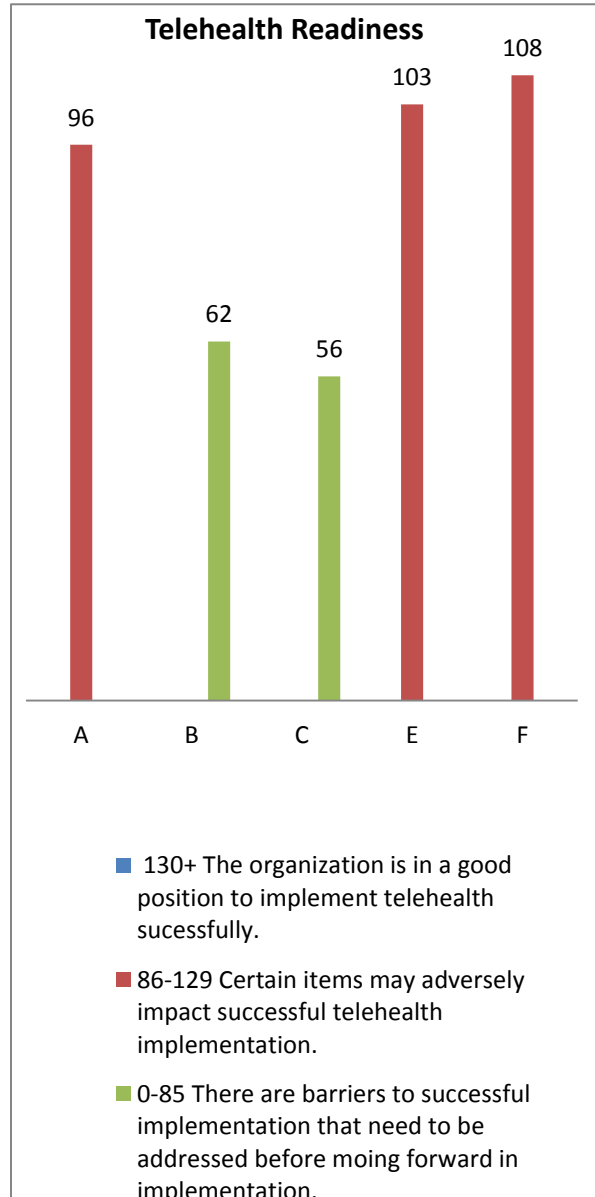
One clinic mentioned reimbursement policies of managed care and state Medicaid policies as a barrier to implementing a program. Another clinic had concerns about payment if they implemented telemedicine.

Education and policy

Half the interviewees were uninformed about telemedicine policies. The other reported some knowledge about telemedicine and were in the process of educating themselves about telemedicine programs. None of the five clinics that responded were rated as ready to successfully implement telehealth. Please refer to the Telehealth Readiness graph to the right.

Manpower and policy

The interviewees reported few people in each clinic that were working on the telemedicine project. One clinic had ordered telemedicine carts through a grant in conjunction with a FQHC with the idea that she would be able to educate herself before educating others about how to use the carts. Two clinics had resources from a management team. Another clinic complained that they could not find specialist interested in participating in telemedicine.

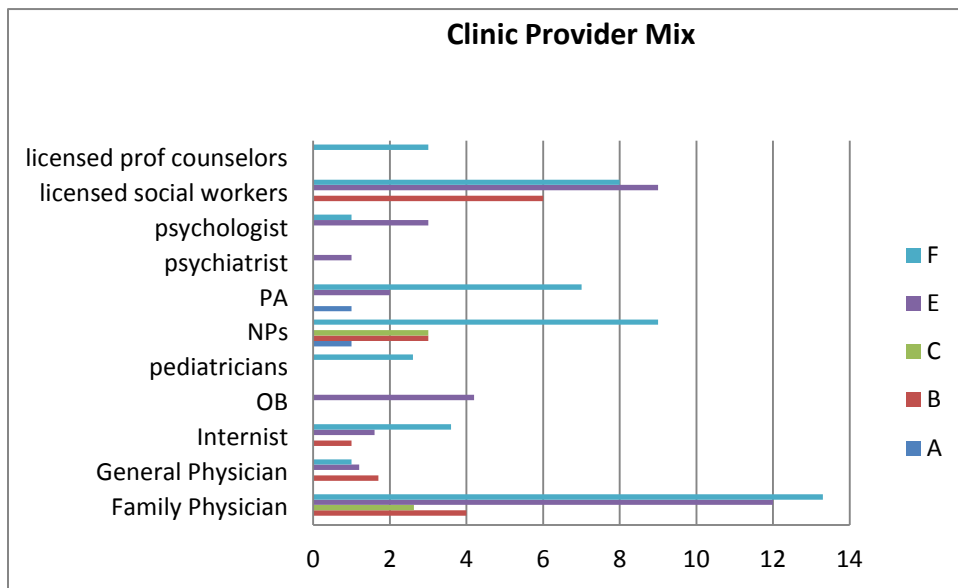


The types of providers and the number of mental health providers in the clinics varied widely. See the graphs below on clinic provider mix and mental health care.

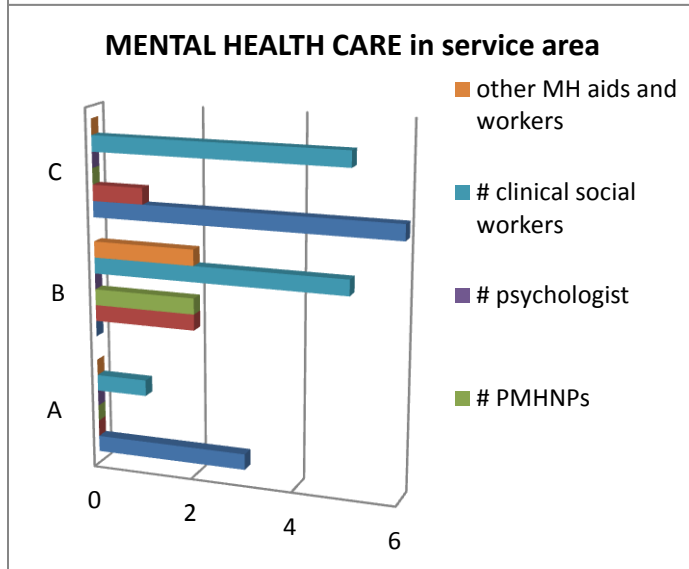
Maps from the Oregon Office of Rural Health show four of the clinics as located in Health Professional Shortage Areas (HPSAs). See Appendices A-F.

Respondents reported that other priorities predominated over telemedicine implementation. Physicians felt overloaded and resisted when asked to learn about or administer a telemedicine program.

Organization and policy



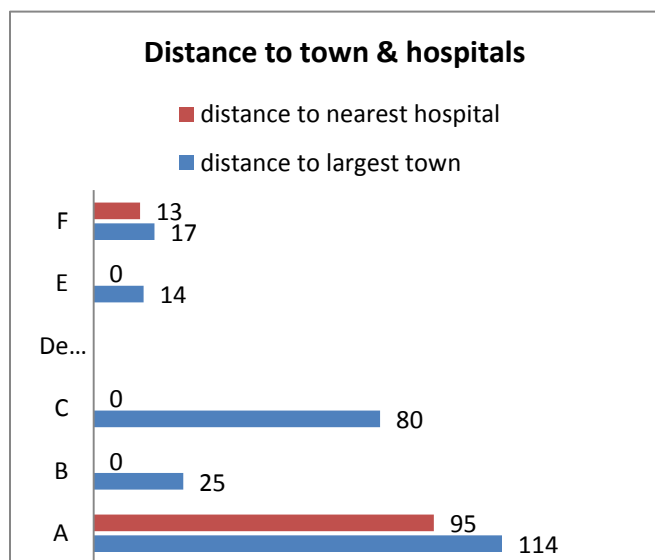
Three clinics were associated with hospitals. One had a project coordinator who championed the



plans to initiate telemedicine. Three clinics would have to rely on their practitioners and clinic managers to implement a telemedicine program. One clinic planned to change their status from fcRHC to a Federally Qualified

Health Clinic (FQHC) which operates under different rules.

Characteristics of the health delivery system (inputs).



The resources available to clinics varied greatly as reflected in the graphs on the clinic’s provider mix (above) and the distance to hospitals and healthcare resources in the service area-see chart to the left. The distance to the nearest hospital varied from a few hundred feet to 95 miles. Human resources varied with the ownership

Years as a fcRHC	4,7,11	3 NR*	
	Yes	No	NR
Non-Profit	2		3
For-profit	1		3
Independently owned	2		4
Provider Based	2		4
Tax base support	2		4
Non-profit affiliations	2		4
*NR=not reported			
Information from ORH clinic summaries (2012).			

structure and association with hospitals. Clinics associated with hospitals reported supportive activities of management teams, whereas those clinics with fewer providers made fewer references to administrative support. The cost of broadband to the health system was a

concern of one clinic, whereas another clinic worried about being responsible for assuring the use of expensive telemedicine equipment. Only one clinic identified a patient who had championed the idea of telemedicine, this person was not interviewed. Other clinics had management or providers as telemedicine champions. One clinic reported they could not find consultants who were willing to engage in a telemedicine program with them.

Resources: volume.

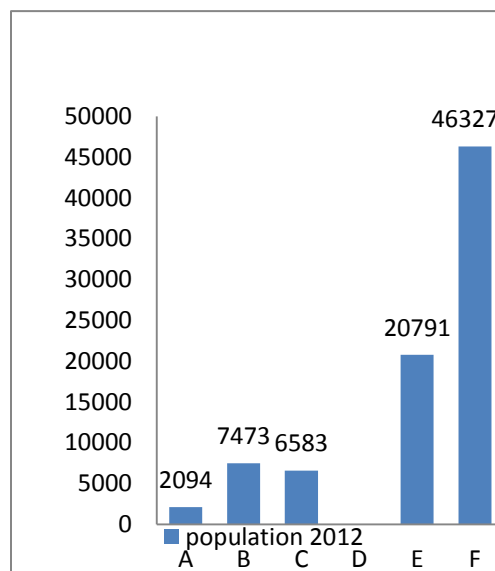
The population of the service areas for the clinics in this project varied widely. Please refer to the graph below on the 2012 population of each clinics service area. The three clinics with smaller populations reported from 2,800-6,000 visits a year; the other three clinics had missing data on population. Clinic utilization data was missing from four clinics so was not reported. The payor mix for the three clinics with smaller populations included about 30% to 43% Medicare and 13% to 34% Medicaid; data on payor mix was missing from two clinics.

Resources: distribution.

Three clinics were near hospitals. One clinic was located in the hospital complex. One clinic was located 25 miles from a hospital, while another clinic was located 95 miles from the nearest hospital-see the chart above.

Organization.

Designation as an fcRHC dictates how the clinic is organized, but ownership structure varied from provider based to private for-profit and independent or



associated with a hospital. Incomplete data prevented comparisons. Refer to the table on clinic ownership.

Organization: entry to the system.

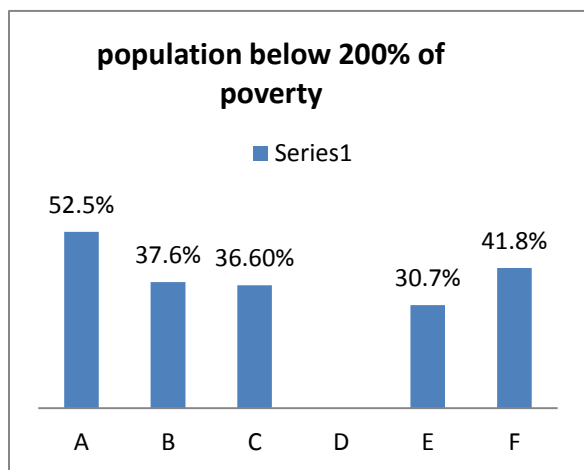
Barriers to the implementation of telemedicine programs included over-extended providers and reluctance to engage in telemedicine until a sound financial plan for telemedicine could be presented. Consultants who were unwilling to engage in a telemedicine program also

limited patient access to care. Finances and insurance reimbursement limited the implementation of telemedicine for one clinic.

Organization: structure.

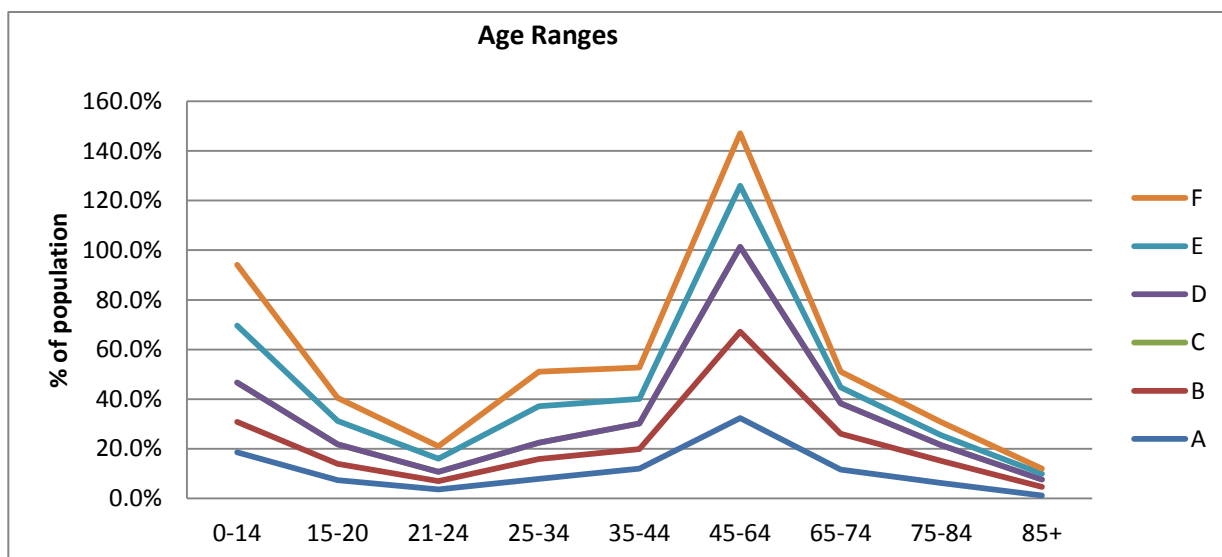
One clinic identified the separation of mental health and medical reimbursement systems as a barrier to integrating telepsychiatry into a fcRHCs practice.

Characteristics of the Population at Risk.

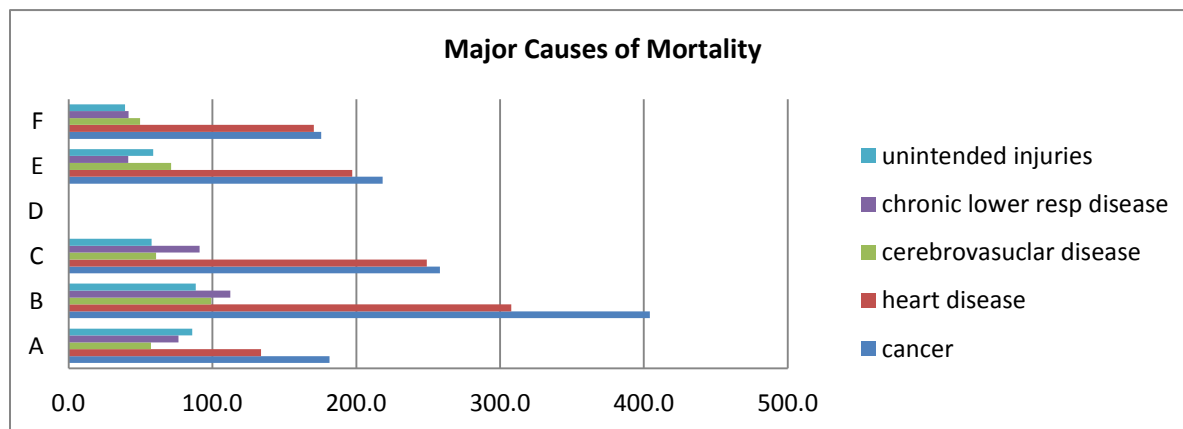


Characteristics of the population at risk determine clinic utilization. The portion of the population below 200% of poverty served by these clinics varied from 30.7% to 52.5%; - see the graph at the left. The high incidence of low-income clients and increasing numbers of baby boomers that were described in the literature are reflected in data from

these clinics. The age distribution included a large spike in those aged 44 to 75 years of age as seen in the graph above; this pattern was mirrored by all the clinics. As shown in the graph



below, major causes of mortality revealed unintended injuries and heart disease were major contributors to mortality for the populations of these service areas. The CDC (2011) recognized the interconnections between chronic diseases, injuries, and mental health as reasons to integrate mental health into prevention programs. The high injuries and chronic diseases in the service population of these fcRHCs suggested they have a pressing need to integrate mental health into



their prevention programs.

Predisposing Population Characteristics.

According to the previous graphs, the populations served by the fcRHCs in this project had an increased number of baby-boomers, as well as high rates of chronic disease and injury. The growing number of people with chronic disease and injury would predispose the population to use the clinics. There was no information about client demand for telemedicine.

Predisposing characteristics: mutable.

One clinic was induced to order telemedicine carts because they were included in a grant with another institution and foresaw a need for mid-levels at outreach sites to communicate with the physicians. One clinic valued telemedicine, but had difficulty convincing consultants of this value. Several interviewees reported that they would like to have a model program to demonstrate how to implement telemedicine in a small facility, or have access to a ready-to-use program that would make it easier to start.

Predisposing characteristics: immutable.

The interviews did not have enough depth to reveal immutable characteristics.

Enabling Characteristics of the Population at Risk.

In terms of telemedicine, or telepsychiatry, the clinic population, socioeconomic characteristics, and geographic locations, affect their access to care; therefore they could be inferred to be enabling factors for the institution of telemedicine. Although one clinic had a patient who, for two years, had championed the idea of telemedicine, none of the clinics reported a market demand for telemedicine from their population base.

Enabling characteristics: mutable.

Mutable factors can be manipulated. Although none of the clinics identified this factor, the NBP manipulated access to broadband through funding opportunities.

Enabling characteristics: immutable.

No factors that were not amenable to change were identified, although physician resistance sounded as though it would be difficult to change.

Needs.

One clinic had mental health demands that motivated the clinic to seek telepsychiatry. Another clinic acknowledged a huge need for telemedicine services. The need for communication between mid-levels and physicians influenced one clinic's desire to use telemedicine.

Needs: perceived.

The majority of the respondents perceived a need for telemedicine, whereas others had not thought about it. The perception of the need for telemedicine among rural residents was not elicited in this project.

Needs: evaluated.

One clinic was aware of the shortage of mental health providers in their area as a factor impacting clients' health and the rural practitioner's ability to practice. One clinic regarded telemedicine as part of their strategic plan. The other clinics had not considered telemedicine.

Utilization of Health Services.

None of the clinics had telemedicine programs to evaluate utilization types, sites, or purposes, nor timing of utilization.

Consumer Satisfaction.

Rural clinics are customers of the NBP, but they did not indicate their satisfaction with the broadband infrastructure or service delivery. The absence of telemedicine programs resulted in no outcome data on client satisfaction.

Interrelation of Factors.

The five categories in the Aday and Andersen (1974) framework illustrate that it is the relationship between the components that result in operationalizing the concept of access to health care. Health policy provided financing for telemedicine and fcRHCs- but did not address how individual clinics would be educated about telemedicine implementation. The NBP has the promise of affecting the manpower shortage through the use of telemedicine but it is not realized in Oregon's fcRHCs. The five fcRHCs who participated in this project reported a lack of resources, client volume, and organizational capacity to deal with healthcare changes necessary to implement telemedicine. The characteristics of the population suggest the need is there, but the client population of the participating clinics had not begun to demand telemedicine. Lack of telemedicine programs leaves utilization and consumer satisfaction possibilities to speculation. This project did not fleece out the interrelation of factors.

IV. Discussion

The context for this inquiry about telemedicine/telepsychiatry was in Oregon fcRHCs. The definition of what context is rural varies widely within Oregon. The width of the NBP's definitions for rural clinics did not match the criteria for fcRHCs. Even though the federal regulations define fcRHCs, this project found how different they can be, thereby making comparisons and generalizations difficult. The proximity to a hospital demonstrates another aspect that is confusing when trying to decipher the meaning of a rural clinic. Not all the clinics had clinic managers on-site, or the clinic managers were not the ones who would be most knowledgeable about plans for telemedicine. Rural Oregon has vast distances between the characteristics of rural clinics, including differences in fcRHCs. Difficulty finding the correct persons to interview took a full six months leading to a protracted data collection window.

The fact that this inquiry was conducted in the context of an academic Doctor-of-Nursing-Practice environment also influenced the findings. Busy providers were wary of an inquiry project associated with academia, especially when it was about telemedicine/telepsychiatry, which was something they did not have. The number of clinics involved was so small that non-participation threatened the project. Getting responses required persistence. To facilitate participant's time and thinking, the interview questions were sent to the interviewees ahead of the interview. The participants were so busy that they agreed to complete the questionnaires and surveys while they were interviewed, thus further time used for in-depth questioning would have been an impropriety. In clinical practice, one day of phone calls would have discovered more information, with more depth and richness.

The themes about barriers to implementation of telemedicine revealed from the interviews in this project were consistent with those reported in the literature. Lack of technical

support and knowledge for the implementation of telemedicine was the most consistently cited obstacle. The clinics had champions, organizational or administrative sanctioning, and communication strategies, but lacked many other necessities deemed to be necessary in the literature. None of the clinics had written policies and procedures. One clinic had the idea they would connect between their satellite sites and the base providers, otherwise none of the clinics reported planning with whom they would connect. They all reportedly were suffering the disruptions of the healthcare reform movement which had taken priority over efforts to implement a telemedicine project.

None of the participating clinics had telemedicine programs. None of the clinics were in a good position to implement a telehealth program according to their scores on The Organizational Telehealth Readiness Questionnaire (Health Telematics Unit, Faculty of Medicine, Calgary University, 2004). Three participating clinics had some preparation but had items that would adversely impact the success of a telemedicine program. Two participating clinics were rated as having barriers to the implementation of a successful telemedicine program.

The literature laments the lack of connectivity and calls for more studies. This project was biased with the assumption that all of these connected clinics had done so with the intent to use telemedicine and further, that they had programs. This assumption was, in the end, very misleading. Consistent with the literature, this project did not fleece out the reasons for lack of connectivity. The quantitative data clearly illustrates that the clinics are located in mental HPSAs and their populations have high levels of injuries and chronic disease, thereby supporting claims by the CDC (2012) that mental health promotion is integral to chronic disease and injury prevention. The literature would lead one to believe that telemedicine/telepsychiatry would be part of the solution in HPSAs, but this did not hold true for the HPSA clinics that participated in

this project. The literature reported that the investment in the telemedicine infrastructure would cause a return to the communities; instead the clinics are worried about being responsible for a return on investment with small numbers to support a program.

Clinical Implications/Recommendations

The health care system and clients will need to create the market for telemedicine. Rural markets are so small that their utilization numbers may be unlikely to support justification of programs, unless the system turns to judging returns on the quality of life and population outcomes. Examining individual clinics does not expose the flaws in the healthcare system and policies that seem to be hampering the adoption of telemedicine in sites with federal funding for the infrastructure and clinic. This project revealed nothing - there still is a dearth of information about how fcRHCs can overcome the barriers to implementation of telemedicine and in turn capitalize on factors that would facilitate implementation.

Conclusions

The literature has many examples of telemedicine networks with rural clinics, yet, as this project found, what defines a clinic as rural can be deceptive. Even fcRHCs, with all the requirements for being in a shortage area, can be isolated over 100 miles from the hospital or less than 100 feet from the hospital. Future inquiry needs to examine fcRHCs with further categorization about the meaning of rural and its effect on the healthcare system. Refined definitions of distance, population characteristics, ownership structure, and association with larger health systems will be required to allow comparison of data. Considering the scarcity of fcRHCs, a national study would be useful in order to have meaningful data sets of fcRHCs that could be further categorized according to defining characteristics, and then sorted and compared between fcRHCs with successful connectivity versus those without connectivity.

V. Summary

The problem was that it was not known whether the Oregon fcRHCs that had connected to the NBP were using the connections for live video teleconferencing (telemedicine) to increase access to care, especially in the area of telepsychiatry. The NBP touted broadband for live video teleconferencing as an answer to the nations pressing need to decrease healthcare cost and improve outcomes. The literature reported that telepsychiatry was the easiest, and usually the first telemedicine program to implement, so the literature searched for this project focused on live video telepsychiatry. In general, the research reveals societal benefit for telemedicine but that it accrues unequally. Rural markets have small economies of scale to reflect the impact of telemedicine/telepsychiatry programs. In the literature, lists of barriers exceeded facilitators to the implementation of telemedicine.

The project was conducted using qualitative interviewing enhanced by qualitative data about the fcRHCs. Six clinics were identified as potential participants, one clinic declined to participate. Interviews and surveys were completed over the phone. The interview data were coded according to themes found in the literature and a model of access by Aday and Aday (1974).

Surprisingly, none of the six fcRHCs connected to the NBP were using their connectivity for telemedicine programs. None of the clinics were ready to implement a telemedicine program. Three clinics had some degree of preparation, but still had obstacles to implementation of a program, and two had barriers to successful implementation. The expectation that the clinics had telemedicine programs biased and limited the project. Definitions of rural and what it means to be a rural clinic, and multiple characteristics defining fcRHCs, need to be studied on a larger

scale. A larger sample of fcRHCs successfully using broadband connections for live video telemedicine could be compared to clinics without telemedicine programs.

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Appendix

Appendix A: Map of Mental Health HPSAs

Appendix B: Map of Oregon Psychiatrist

Appendix C: Map of Oregon Psychologist

Appendix D: Map of Oregon Social workers

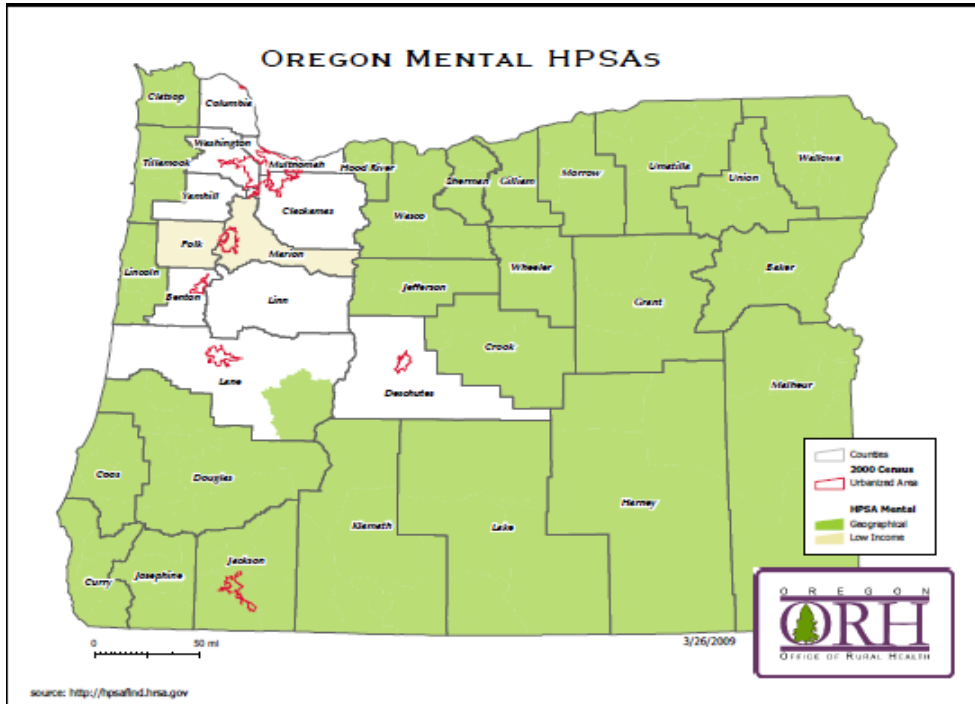
Appendix E Recruitment Explanations

Appendix F: Survey Questions about the Clinic

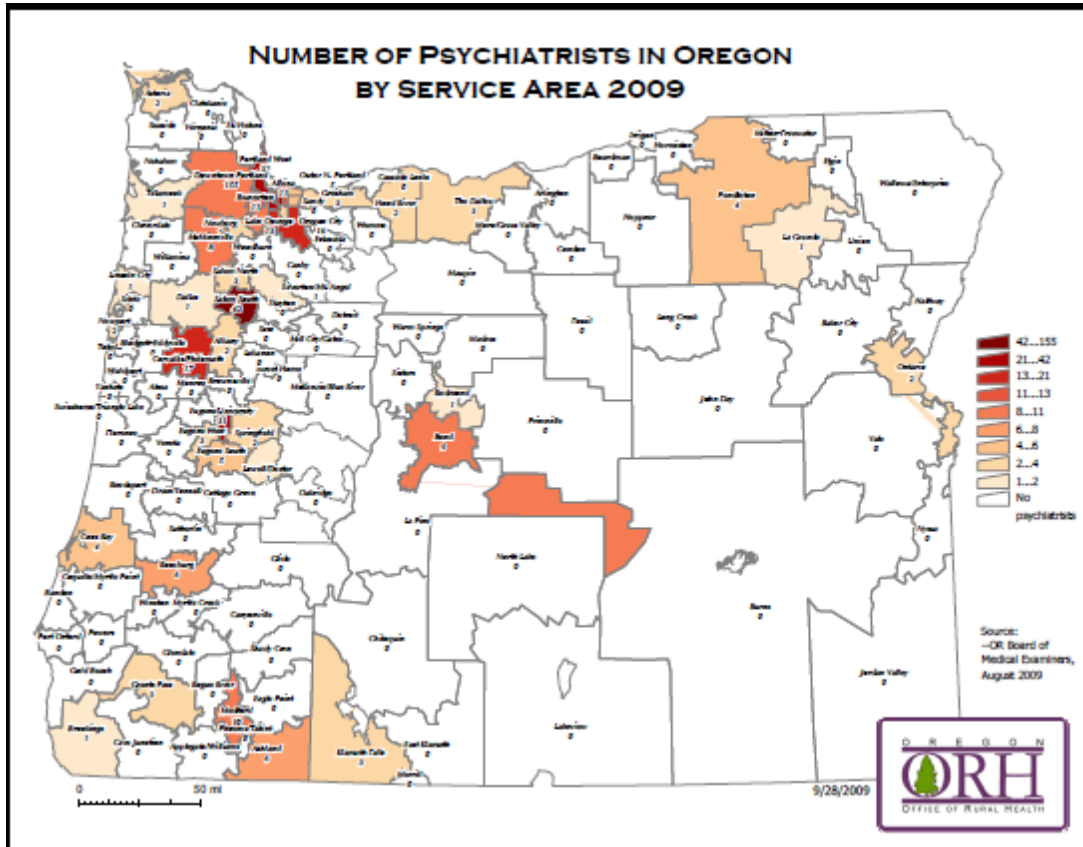
Appendix G: Organizational Telehealth Readiness Assessment Tool

Appendix H: Interview Questions and Coding Guide

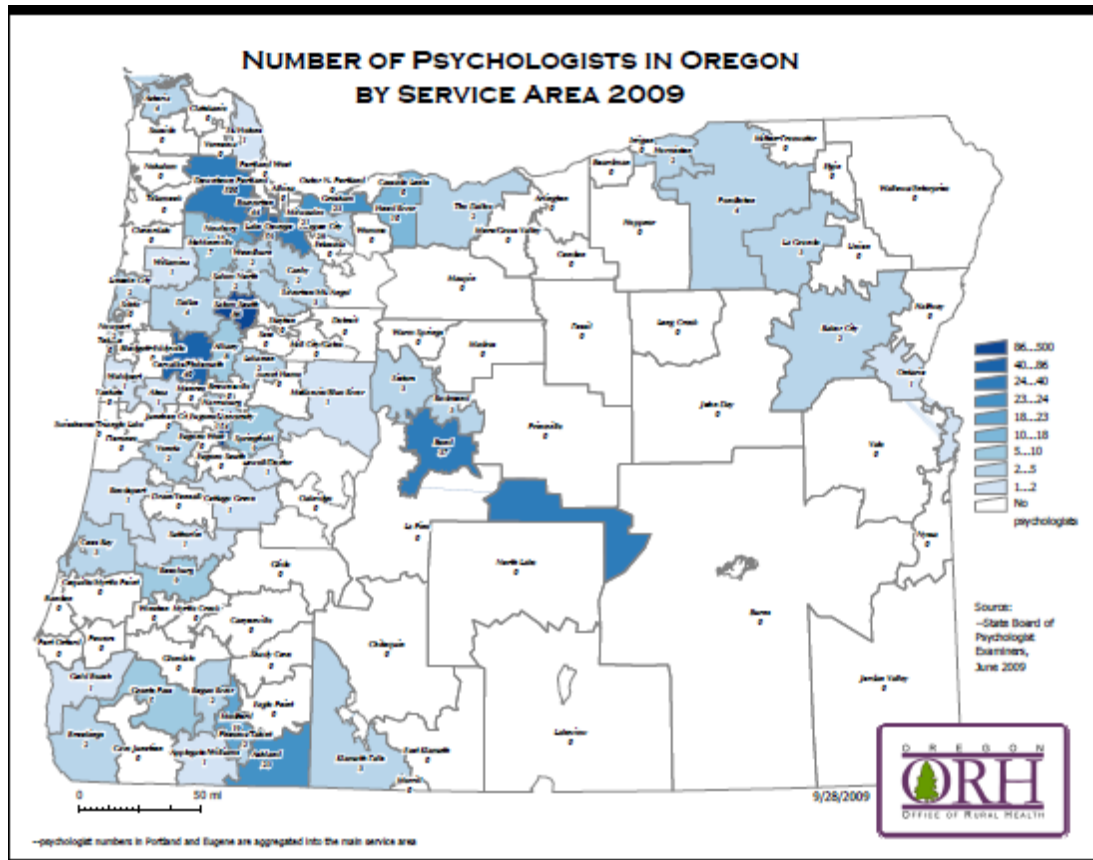
Appendix A



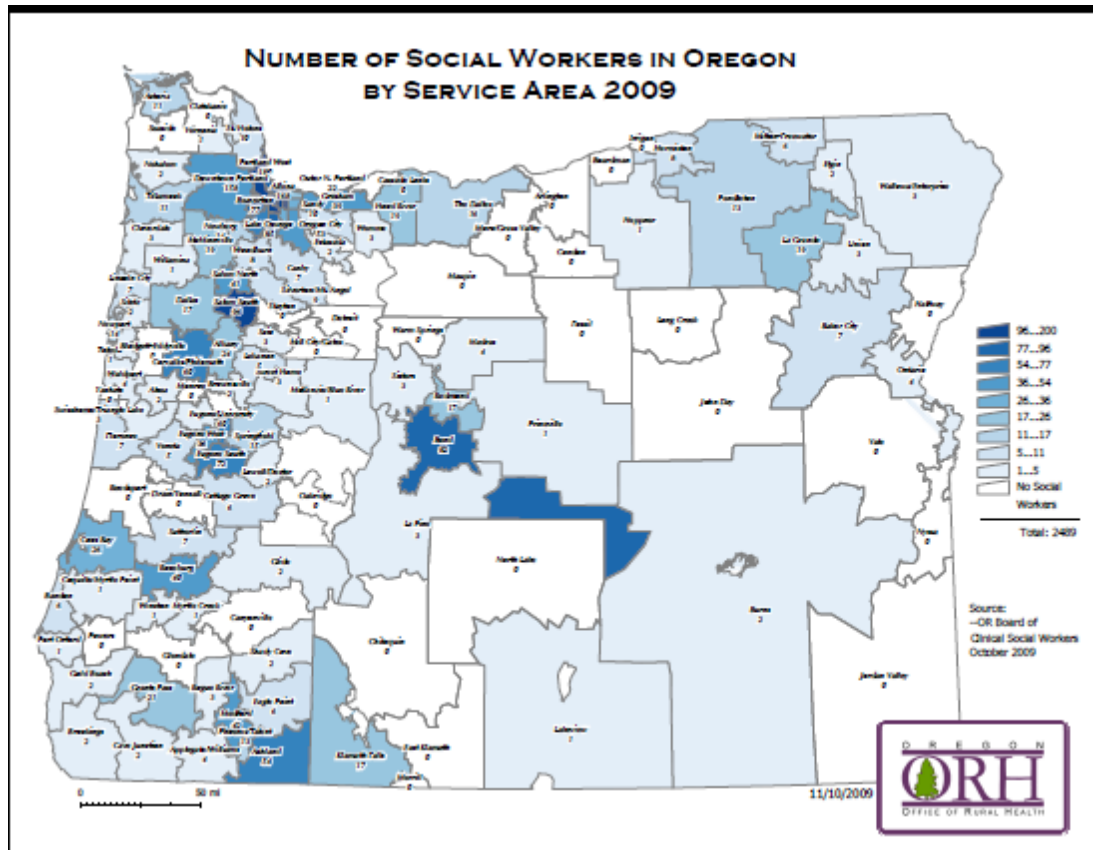
Appendix B



Appendix C



Appendix D



Appendix E Recruitment Explanation

To Whom it Concerns:

I am a Doctor of Nursing Practice student at Oregon Health and Sciences School of Nursing and a Nurse Practitioner in a federally certified rural health clinic. I am inviting you to participate in a study about telehealth programs, in particular telepsychiatry, and the use of the Oregon Health Network broadband connection.

The federal governments National Broadband Plan, which the Oregon Health Network is implementing in Oregon, intended to increase access to healthcare for rural clients through telemedicine programs. Telepsychiatry is often recommended as the first program as it needs the least equipment and is the easiest to start.

As of June 2012, only six of the 60 federally certified rural health clinics in Oregon were connected to the Oregon Health Network. Little is known about how Oregon clinics are using the federal broadband program. I would like to do a qualitative descriptive study of the six clinics connected to the Oregon Health Network broadband about the facilitators, barriers, and expectations your clinic has experienced. Participants and clinics will be given a letter or number as an identifier; I will be the only one with access to the code that identifies you or your clinic and will keep the code in a safe until the completion of the study.

Participation in this study involves the clinic manager filling out a survey and questionnaire online on Survey Monkey, or by e-mail, and an interview of the clinic manager. I would like the clinic manager to identify others who were key participants and champions of the idea whom I would then contact and interview. Even if your clinic does not have a telehealth program in place, I would like to include your responses about why a program is not in place, or if your organization expects to have a telemedicine program.

I expect the survey to take about 15 minutes, and the questionnaire to take another 15 to 30 minutes. The goal of the interviews is to be no more than an hour long.

Your participation in this study is important to identify the status of federally certified rural health clinics use of broadband in Oregon. I look forward to your participation.

You are being asked to join a research study. You do not have to join the study. Even if you decide to join now, you can change your mind later.

If you decide to join, you will be asked to sign a consent form, which shows you give permission to be in the study, and an authorization form, which shows you give permission for us to use your health information for the study.

Appendix F
Survey Questions about the Clinic

ABOUT THE CLINIC

(Results will be displayed as pie graph percentages, and where possible, clustered into categories for calculation of a mean and standard deviation.)

In service as a Federally Certified Rural Health Clinic for ____years

Ownership structure (check all that apply)

Non-profit _____ or For Profit _____

Independent/ Privately owned ___no ___yes

(Definition of independent/private ownership: entity that is “subject to reimbursement cap based on average cost per visit)

Provider based ___no ___yes

(Definition of provider based: owned by hospital, nursing home, or home health agency and must submit a Provider-Based Attestation and be approved by CMS)

Supported by a tax base ___no ___yes

Affiliated with non-profit organization ___no ___yes

DEMOGRAPHICS

(Results will be displayed in 3-D graphs and or pie chart)

Number of clinics within a 25 mile radius of your clinic ____

Distance to nearest hospital ____

Census of service area _____

Service area square miles _____

Providers in your clinic

PA ___#hours they provide care ___ # visits/year

NP _____ #hours they provide care ___# visits/ year

psychologist _____ #hours they provide care ___ # visits/year

Clinical Social Workers ___#hours they provide care
___ #visits/ year

MENTAL HEALTH CARE in your service area

(Results will be displayed in a 3-d graph)

Where do clients receive mental health services? _____

of mental health providers available in service area _____

Psychiatrist _____

PMHNP _____

Psychologist _____

clinical social workers _____

alcohol and drug counselors’ _____

other mental health aids and workers _____

CLINIC AND PROGRAM UTILIZATION

of clients served by the clinic each year ____

of patient visits to the clinic each year ____

of patients served each year by telepsychiatry ____ other telemedicine programs ____

of visits each year to telepsychiatry ___ other telemedicine programs _____

REIMBURSEMENT CHARACTERISTICS

(Results will be displayed in a pie graph.)

Payor mix

% Medicare ___ % Medicaid ___ % private insurance ___ % private pay ___

IF you have a telepsychiatric/telemedicine program.....

Do you bill an originator fee ___no ___yes?

Does the managed care/CCO reimburse for telemedicine services? ___no ___yes?

If yes, at what percent? _____

Are there any reimbursement issues with telepsychiatry/telemedicine? ___no ___yes

If yes, please describe:

Appendix G

ORGANIZATIONAL TELEHEALTH READINESS ASSESSMENT TOOL

Using the five-point scale rate **your organization** on the following statements

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree
- 0 = Don’t Know

0 ORGANIZATIONAL CORE READINESS

Your organization:	SCORE
Is aware of, and able to clearly articulate needs	
Expresses and feels dissatisfaction with the ways it currently has available to deliver care (e.g. status quo)	
Other (please explain)	
(A) Sub-total	

B. ORGANIZATIONAL ENGAGEMENT & PLANNING READINESS

Your organization:	SCORE
Has organizational buy-in for telehealth	
Has individuals who are champions for telehealth (clinical/provider, senior administration, & community champions)	
Has leadership who are risk-takers and pioneers for reaching novel innovations	
Is aware of organizational dynamics between innovators and resisters	
Has the commitment and support of senior administrators	
Has access to sufficient ongoing funding from local, provincial and federal institutions	
Has established collaborative partnerships	
Has in place methods for telehealth communication/profiling/awareness, and is actively involved in promoting these	
Has examples and evidence of telehealth applications in similar contexts/environments/communities	
Exhibits healthy inter-organizational dynamics in telehealth promotion activities	
Is willing to consider short-medium- and long-term timelines for implementation	
Has established mechanisms of knowledge transfer among staff members	
Participates in a community consultation process	
Conducts ongoing needs assessments and analysis	
Has a strategic business plan including: <ul style="list-style-type: none"> ▪ A marketing, communication, and evaluation plan ▪ A cost benefit & cost effectiveness assessment, including benefits and risks ▪ Financial readiness for sustainability 	
Other (please explain)	
(B) Sub-total	

Developed by the Health Telematics Unit, Faculty of Medicine, University of Calgary, 2004.

Continued on Back.....

C. ORGANIZATIONAL WORKPLACE READINESS (Administrative, Human, and Physical Structures)

Your organization:	SCORE
Ensures that workplaces are prepared for telehealth technology & equipment <ul style="list-style-type: none"> ▪ Establishes proper facilities (i.e., location, lighting, size, HVAC, and other appropriate equipment) ▪ Locates telehealth equipment where it is convenient for providers to use as a tool to deliver patient care ▪ Facilitates the creative use of equipment by practitioners and patients ▪ Provides administrative support for clinical decisions, functioning, & the process of using the telehealth system ▪ Has a standardized, well defined easy to use referral system ▪ Has a standard and consistent method of record keeping at both the receiving and referring site. 	
Recognizes and addresses policies & procedures/professional & regulatory barriers: <ul style="list-style-type: none"> ▪ Ascertains that telehealth practices conform to health protection laws ▪ Ascertains that telehealth practices conform to professional regulatory policies ▪ Reviews existing policies, standards, and procedures to determine if telehealth is covered under them, if not, revises as appropriate ▪ Formulates and integrates written policies on reimbursement, liability, cross-jurisdiction use, and privacy issues ▪ Prepares related written procedure manuals ▪ Formulates policies for defining who gets privileges to use telehealth at the receiving and referring sites 	
Establishes open lines of communication: <ul style="list-style-type: none"> ▪ Manages open communication, keeping all stakeholders well informed ▪ Participates in communication to facilitate team building ▪ Liaises with practitioners, patients, and the public as important players in the successful implementation of telehealth 	
Addresses change management readiness: <ul style="list-style-type: none"> ▪ Has a change management plan in place to deal with organizational input ▪ Has effective scheduling and integration of innovations into established practices 	
Addresses human resources readiness: <ul style="list-style-type: none"> ▪ Has adequate and dedicated human resources to implement the strategic plan ▪ Employs a local telehealth coordinator ▪ Determines classification of roles and responsibilities in relation to specific telehealth application(s). 	
Addresses training & continuing professional development (CPD) readiness: <ul style="list-style-type: none"> ▪ Prepares staff, and all end-users for initial and ongoing training ▪ Has a training and CPD plan in place related to telehealth ▪ Has past telehealth experience gained from projects or pilot programs & their evaluation 	
Other (please explain)	
© Sub-total	

D. ORGANIZATIONAL TECHNICAL READINESS

Your organization:	SCORE
Has addressed the technical feasibility and technical requirement issues	
Has established interoperability of equipment & technology	
Has a consistent approach to verification of the fidelity of data transmission	
Has validated that the technology actually works	
Has access to comprehensive technical support that is available locally and on-call	
Other (please explain)	
(D) Sub-total	

Developed by the Health Telematics Unit, Faculty of Medicine, University of Calgary, 2004.

Total Score: A+B+C+D = _____

SCORING:

- 130 + The organization is in a good position to implement telehealth successfully
- 86 – 129 Certain items may adversely impact successful telehealth implementation.
- 0 – 85 There are barriers to successful implementation that need to be addressed before moving forward in implementation

Developed by the Health Telematics Unit, Faculty of Medicine, University of Calgary, 2004.

Appendix H
Interview Questions

Has your clinic considered offering telemedicine or tele-mental health services using the broadband connection? Yes___ No___

If yes divert to review of organizational readiness tool
(Results will be displayed in a graph as to yes no, and pie chart to show degree of readiness.)

Who is it that is championing (encouraging/pushing for) the telemedicine programs?.
(This data can be displayed in a table showing the clinic on the horizontal axis and the champions & roles on the vertical axis.)

What are the barriers to implementing a telepsychiatry/telemedicine program?
(Results can be displayed in a table.)

What are the facilitators to implementing a telepsychiatry/telemedicine program?
(Results can be displayed in a table.)

What were/are the expectations of the organization and individuals for a telepsychiatry/telemedicine program?
(Results can be displayed in a table.)

CODING Guide

Barrier themes in the literature to look for in interview (yes=1 no = 0)

- Reimbursement issues
 - Investment to initiate too much
 - No return on investment
- Providers resistant
- Organizational dysfunction
- Administrative resistance or lack of knowledgeable support
- No one to partner with
- No one knows how to do it- lack of technical support
- Lack of personnel to do it,
- Resistant to change (people &/or organization)
- Poor communication in organization

Facilitators mentioned in the literature to look for in interview (yes =1 no =0)

- Champion
- Administrative support
- Communication channels that keep everyone informed.
- Partnerships with agency doing it
- Human resources exist to deal with the disruption and change
- Has defined referral system
- Has a defined plan for referrals
- Has a defined policy of who gets to use telehealth
- Has a defined policy and procedure manual.

Has advertising plan

Has access to funding

Sees return on investment, both \$ and improved services to community etc.

Themes that emerged from the interviews not mentioned in literature: