

The Economic Impact of Telemedicine Capability in a Rural Hospital

As various forms of electronic interaction become more commonplace in today's society, the combination of this technology and health care has the potential to greatly impact the lives of rural residents. From a quality-of-life perspective, telemedicine allows rural individuals to be "observed" by specialists in various parts of the county, and increases the spectrum of health care services available to them. In fact, the presence of telemedicine has been shown to increase the perception of health care quality in rural communities. However, the benefits of such a center to rural individuals and communities include much more than simply improved health services. The local economy is also enhanced via the addition of telemedicine capability.

Telemedicine can take various forms, but typically involves the interaction of a patient and local nurse or technician in one location and some type of physician in a separate geographic location. The estimates involved in this study deal with two of the most common forms of telemedicine, which are teleradiology and telepsychiatry. Teleradiology consists of scanning a patient's X-ray and transmitting the resulting digital image to a radiologist at another location. Telepsychiatry involves "real-time," two-way interactive television where the physician and patient conduct a counseling session as if they were face-to-face.

This paper provides a methodology for estimating the economic impact of teleradiology and telepsychiatry in a rural community. This impact is broken into four distinct categories. Three categories deal with opportunity costs, or savings that are recognized due to telemedicine, while one deals with an increase in economic activity in the area. The four categories are:

- 1) Reduced personnel costs for hospitals since work is outsourced and full-time specialists are not directly employed;
- 2) Transportation savings to patients who would otherwise need to commute to an urban location;
- 3) Missed work income savings to patients who would otherwise need to commute to an urban location;
- 4) An increase in the use of local auxiliary medical services (i.e. laboratories or pharmacies) because patients do not travel to other communities for their initial service.

The primary source of data for this study comes from Oklahoma State University's Telemedicine Network, consisting of 22 locations throughout Oklahoma. Methodologies associated with each of the four categories were applied to five rural communities with hospitals of varying size. The hospitals also differed in the types of telemedicine services they offered and the number of encounters performed. The abridged table below provides a summary of the economic impact to these communities, including associated cost estimates of equipment required for telemedicine services.

The values of the four categories of impacts will vary based on the community where telemedicine is employed. Local factors that affect the economic impact include the number of telemedicine encounters that the community participates in, the number of full-time equivalent radiologists / psychiatrists that the hospital currently employs, the distance to the nearest substitute location, and the average wage rate for that particular area.

RESULTS

In general, each community in the study recognizes an annual economic impact of at least \$185,000 generated by the use of telemedicine. For communities with bigger hospitals, the annual economic impact can be quite large, ranging from \$400,000-\$1.8 million. The primary components of these impacts can fluctuate dramatically between communities based on any number of factors, including the distance to nearest substitute location (typically quite large for psychiatric work) and the number of telemedicine encounters performed.

OTHER ISSUES

While this report focuses on a number of savings and benefits to the community associated with telemedicine, it also recognizes that other issues may play into the decision on whether or not to implement telemedicine in a rural hospital. Topics discussed include the procurement and maintenance costs of telemedicine equipment, reimbursement issues, and acceptance by the medical community and patients. Using this report in conjunction with other sources of information should provide a basis for understand the overarching impacts of setting up a telemedicine system.

Summary of Telemedicine Economic Impacts

City	Number of Beds	Community Population	Annual Encounters		Hospital Equipment Costs	Annual Cost Savings				ANNUAL TOTALS
			Tele-radiology	Tele-psychiatry		Personnel Costs	Missed Work	Transportation Savings	Pharmacy / Lab	
Bristow	30	4,300	6,600		\$17,100	\$41,000	\$4,723	\$9,603	\$389,400	\$444,726
Hugo	34	5,500	9,600		\$24,300	\$146,400	\$10,307	\$24,677	\$566,400	\$747,783
Idabel	111	7,000		1,500	\$22,000	\$80,000	\$77,108	\$168,780	\$63,750	\$389,638
Poteau	84	8,000	27,600		\$24,700	\$128,000	\$24,431	\$41,497	\$1,628,400	\$1,822,327
Waurika	25	2,000	1,740	96	\$35,300	\$24,480	\$4,420	\$10,144	\$106,740	\$145,784

For a complete copy of "The Economic Impact of Telemedicine Capability in a Rural Hospital," see the National Center for Rural Health Works website (www.ruralhealthworks.org)