Helping Decision-Makers Maintain Primary Health Care Services in Rural Counties

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High quality infrastructure is critical for quality of life preservation as well as an essential component of growth and development. As facilities and services deteriorate and/or become inadequate, growth is deterred and quality of life is adversely affected. A viable health sector is a major component of a community's infrastructure. Furthermore, attraction of new firms to provide jobs and economic growth can be extremely difficult without the availability of quality medical services. Several studies support the importance of a quality health sector in rural communities for industrial development and for retaining existing businesses and industries [7,23,31]. Finally, the attraction of retirees can be an effective economic development strategy. Selected studies [30,32,34] have indicated that health services were one of the primary concerns for selection of retirement locations for the elderly. Consequently, it is imperative that rural communities have quality health services.

More changes are occurring in the delivery of health services than ever before in America's history. Hospital and physician networks are being created. Managed care is being introduced into rural communities. In addition, fiscal problems with Medicare and Medicaid may impose additional financial stress and changes with the delivery of health services in rural areas. Aside from its contribution to existing quality of life and economic growth projects, the health sector provides significant direct economic benefits through employment and income impacts on a community. The objective of this paper is to demonstrate the importance of the health sector to the economy of a rural community and to discuss what community leaders can do to maintain and promote their health sector. More specifically, the objectives are to:

1. Measure the total impact of the health sector on a community's economy;
2. Illustrate the importance of the health sector for industrial growth;
3. Illustrate the importance of the health sector for retirement growth;
4. Discuss and demonstrate what community leaders can do to maintain and promote their health sector; and
5. Review a community health planning process.

Measuring the Health Sector Impact on the Economy

The health sector at the community level is generally not looked at as a large employer, but in fact it is extremely large. In many rural communities, a rural hospital is often the second largest employer [13]. The largest employer is often the school system. If the employment of the hospital is added to the other health components such as physicians, pharmacies, etc., and the total impact of the health sector is included, health generated employment is often

about 10 percent of a rural community's employment. When the secondary benefits are included in this analysis, the health sector often accounts for about 15 percent of the total employment [14]. Several selected studies that illustrate how to measure the impact of the health sector will be reviewed.

Christianson and Faulkner [8] measured the impact of a hospital closing on a local economy. Like most studies, they measured the impact of hospital expenditures by employing economic base theory. The study area included rural counties which contained one hospital in Idaho, Montana, Nebraska, Nevada, North Dakota, Utah and Wyoming. Questionnaires were sent to 180 hospital administrators to gather the necessary data for the economic base model. Results showed that the average hospital spent $600,000. Depending upon the multiplier used, the total simulated direct, indirect and induced community income resulting from the hospital was in the range of $700,000 to $1 million.

The economic impact of Saunders County Community Hospital in rural Nebraska was measured in another study by Turner and Mallory [35]. The hospital impact study they conducted was slightly different than others as they estimated the income coming to the community from Medicare and Medicaid. They estimated that 73 percent of total hospital revenue, or $1,278,632, came from Medicare and Medicaid payments. They also estimated that Medicare and Medicaid paid physicians another $383,196 annually. Thus, total Medicare and Medicaid payments were $1,661,828. A multiplier of 2.0 was applied to this to arrive at the total impact of Medicare and Medicaid on the local economy.

Erickson, Gavin and Cordes [17] measured the impact of the health sector on the Pittsburgh Metropolitan area. The objective of the study was to measure the role of the hospital sector on interregional trade and to assess its impact on the regional economy. The results generated an economic base multiplier of 2.69 and concluded that the hospital sector had a large export component; it generated regional income and employment equal to $655 million and 22,000 jobs, respectively.

The impact of a rural hospital was estimated by applying a simulation model to Stigler, OK [12]. Stigler is the county seat and the largest community in the county with an approximate population of 2,600 in 1986. The model is a recursive system of equations built around an input-output model. The base of the simulator model is the input-output model. County input-output models are available for each county in the United States through the USDA IMPLAN project.

To measure the impact of the hospital, the researchers ran two runs on the simulation model. The first, or baseline run, assumed that the hospital and

other sectors would maintain the same growth patterns as exhibited during the preceding five years. The second run, called the impact simulation run, assumed the hospital would close. Employment loss during 1988 (the year the hospital is assumed to close) was 51 jobs. This included the 43 hospital jobs. Thus, the indirect or induced loss of jobs in other sectors of the economy was 8 jobs. As employees who lost jobs could not find other employment, migration would begin, and more indirect and induced jobs would be lost. The total loss of jobs would be 78 in 1992, five years after the hospital closed. The study also presented estimates of population, income, retail sales and sales tax collection losses from 1988 to 1992.

A recent study [24] measured the economic impact of a hospital on rural communities. The researchers used survey data and an economic base model. The researchers estimated direct and indirect economic effects of four rural hospitals located in Utah. Hospital A is 20 miles from a regional medical center and services a rural constituency. Hospitals B and C are in agricultural areas, and both are about 80 miles from a major medical center. Hospital D is located in an agricultural and mining area, approximately 150 miles from a major medical center. Direct and indirect employment estimates were made using an economic base model. The hospital alone accounted for 4 percent to 9.3 percent of the service area employment.

One study [18] measured the impact of rural physicians on a community's economy. Again, the community simulation model as discussed above was employed. First, the model generated a baseline estimate tied to the assumption that the physicians would continue to practice. The second run assumed the physicians would not practice in the community. The difference between the two runs measured the impact of the physicians on the community's economy. The study community was Pawhuska, OK, a community of approximately 5,000 residents located in a relatively isolated part of Oklahoma. The community had three full-time physicians and one retired physician who worked one day a week. Thus, it was assumed that 3.2 FTE's of physician services were available. It was estimated that the physicians and their offices accounted for 15.2 jobs. Based on an employment multiplier of 1.78, the total community employment effect was 27 jobs. The results also illustrated the impact of the physicians on income, retail sales and sales tax collection.

Very few studies address physician practices, and none study the other components of the health sector. Moreover, in contrast to the above academic-based studies, this paper offers a previously unavailable tool to permit users to perform economic impact calculations for their communities by plugging in local data.

A model to estimate the economic impact of the health sector has been devel-

oped by Doeksen, Johnson, and Willoughby [14]. It uses data and regional tools that are available at the county level. Noble County, OK, will be used to demonstrate the model. The county is located in Central Oklahoma and has about 11,000 residents. The model has five health sectors which include a hospital; physicians, dentists and other professionals; nursing homes and other residential facilities; other medical and health services; and pharmacies. Employment and payroll information associated with each sector needs to be locally collected. For Noble County, the data are presented in Table 1. These are referred to as the direct economic activities and do not include the secondary benefits that arise due to employee and business spending. In Noble County, there are 100 people employed by the hospital - 43 by physicians, dentists and other professional offices, etc. Total health sector jobs are 292.5 with a payroll of $6,820,500.

The secondary benefits are measured by county employment and income multipliers. These multipliers measure all secondary impacts of the health sector dollars as they flow through the county. The multiplier and impacts on Noble County are presented in Table 2.

The data in Table 2 clearly demonstrates the impact for each health sector and for the total health sector. For example, the hospital has 100 employees, and the IMPLAN multiplier for that sector is 1.46. Total employment impact is 146. Total income from the hospital activities is $3,158,870; retail sales $947,661; and three-cent sales tax collections are $28,430. The total impact of the health sector on the economy is 457.6 jobs; $9,528,735 in income; $2,858,621 in retail sales; and $85,759 in sales tax.

The procedure has been applied to nine Oklahoma Counties within the past year. Summary statistics are provided in Table 3. Key results from these studies include:

- ❖ About 9 percent of all employment is directly working in the health sector;
- ❖ About 14 percent of all employment is attributed to the health sector;
- ❖ Employment multipliers ranged from 1.30 to 1.81;
- ❖ Income multipliers ranged from 1.45 to 1.87;
- ❖ Hospitals are often the second largest employer in the county; and
- ❖ Nursing homes created a very large number of jobs.

It is clear that the economic impact of the health sector on these counties is tremendous. If the health sector increases or decreases in size, the medical health of the county, as well as the economic health, will be greatly effected. For the attraction of industrial firms, businesses and retirees, it is crucial that the area have a quality health sector. Often overlooked is the fact that a “healthy” health sector greatly contributes to the economic health of the county.

Importance of the Health Sector for Industrial Growth

As rural communities attempt to diversify their economies, retaining existing businesses and industries and attracting new businesses and industries are generally growth strategies. The question that arises is how important is the viable health sector to business and industrial decision-makers as they evaluate a community for locational purposes. Research studies investigating this hypothesis are few. One study [23] found that quality-of-life (QOL) factors are playing a dramatic role in location decisions. The study concluded, "In fact, almost half (facility planners) say QOL considerations are controlling both initial screening and final site selections."

The most important QOL variables were transportation, education and health. Another related finding by Lyne is the role of health care costs in industrial location decisions [22]. Specifically, Lyne's survey of corporate executives indicated that corporations are sometimes giving priority to sites which provide health services at low costs as a tie-breaking factor between comparable sites, to the extent that rural areas are often able to provide health care at lower costs than their urban counterparts. This development may bode well for at least some rural areas.

McGuire [25] conducted a detailed review of the literature and reports that, "…the evidence appears to be that there is a positive and perhaps strong relationship between infrastructure and economic development."

Importance of the Health Sector for Retirement Growth

Retirees form a special group of residents whose spending and purchasing can be an important source of local jobs. Additionally, middle and upper income retirees often have substantial new worth. Many rural areas have environments (e.g., good climate and outdoor activities) that enable them to be in a good position to attract retirees. Retaining retirees is, of course, just as important as attracting new retirees, and the rural population contains a relatively high proportion of elderly, including retirees. The amount of spending "embodied" in this population, including the purchasing power associated with Social Security and other transfer payments, is substantial. Hence, a critical economic development question is the extent to which the availability of health services influences the location decision of retirees. Although the data are limited, at least several studies suggest health services may be a critical variable.

For example, Toseland and Rasch [34] conducted a survey of 878 persons, 55 years of age or older, in 28 communities in the U.S. The four items that were the best predictors of retirement location were safety, recreational facilities, dwelling units and health care. As another example, Reginier and Gelwicks [30] surveyed 221 people, 60 years or older, who were considering a retire-

ment community. Nearly 60 percent said health services were in the "must have" category. Only protective services were mentioned more often than health services as a "must have" service. Finally, a case study in rural North Carolina [29] noted that the:

> "lack of local long-term services and hospital beds has resulted in increasing numbers of seniors being forced to receive medical care in the same distant locations (50 miles away or more) as they are hospitalized. This has resulted in a service displacement cycle in which many of these seniors have been forced to relocate in order to receive needed rehabilitation and support services" (p.44).

What Can Rural Community Leaders Do?

The above sections clearly indicate that a viable health sector is needed for rural economic development. The question now is, "What can rural leaders do to insure a community has a viable health sector?" Answers to this question are not easy and will require hard work by rural health decision-makers. Much can be learned from experiences of others and research projects. The Office of Rural Health Policy [27] studied innovative health programs in five rural communities in Alabama, Iowa, Oregon, Texas and Wisconsin. Each embodied a very different system of innovative health care delivery. However, five common themes emerged relative to the underlying community dynamics. The themes were:

1. **A realistic perspective on health care delivery**. Each community was objective about the circumstances it faced as the innovation began and evolved…

2. **The willingness to identify, develop and pursue non-conventional solutions**. New problems may require new solutions, but too often the same approaches reappear. This was not the case, however, among our case study sites. Each demonstrated in its own way a certain defiance of conventional wisdom and a willingness to imagine and take risks – risks that were "rational" within the constraints of its own situation…

3. **Frugality and tight management to carefully allocate limited resources**. Operating profits and other forms of development capital for health care delivery improvements are scarce in rural communities. The scarcity is more profound in the smaller, more isolated communities that are least able to sustain local health care capability. Furthermore, the rural population is generally poorer and more fiscally conservative than their metropolitan counterparts…

4. **The ability to gain support from local health care consumers**. All of the case study innovations had strong, though not unanimous, local public

support…

__5. **Political effectiveness – communicating the needs of the innovation to those outside the community who could offer assistance.** Political effectiveness, the ability to gain needed external political support for their local innovations, was important in each case study sites (p. 41- 42).

These five aspects of the community environment are not always present nor are they always easy to develop. Fortunately, there are organized processes that are often helpful in enabling communities to work through in a systematic fashion their challenges, opportunities and options. The above themes apply to all health components. The role of local initiative and creativity is crucial and vital. Without it, the health sector and local economy will deteriorate. One local action is to conduct strategic health planning.

The Health Planning Process

Strategic health planning is a process. The process assists local communities to identify their health care needs; to examine the social, economic and political realities affecting the local delivery of health care; to determine what the community wants and realistically can achieve in a health care system to meet their needs; and to develop and mobilize an action plan based on their analysis and planning. Strategic health planning involves cooperation among people and organizations to pursue common goals. The process is designed to answer three questions:

1. Where is the community now?
2. Where does the community want to go?
3. How will the community get there?

The process should be started when community citizens have a shared need for health care, when community leaders can be mobilized to take action, and when a resource team or facilitating group can be identified to assist the community to carry out the process. The strategic health planning process must be “community driven.” The community, as represented by the leaders, must “own” or “drive” the process; it should be community-based, not hospital-based or health care provider-based. Local residents and their leaders must come forth; a current knowledge of the health care industry is not necessary. This process is about local people solving local problems. The local hospital and health care providers should have input into the process and should support and “trust” the process. But the community must provide the energy and commitment.

The strategic health planning process is outlined in Figure 1 and begins with a group of citizens of a community becoming interested in reviewing and analyzing the health care system of the community. This group of citizens is

the initiating group (Figure 1). Often, the initiation of the process may result from a change in the current health care delivery system such as the loss of a physician or a hospital or a change in the type of services or facilities offered. A community that is not currently experiencing changes or problems in their health care system can also benefit from strategic health planning by enhancing or improving the current system. The initiating group of citizens will form a Community Health Steering Committee to work through the process of strategic health planning, developing a plan, and implementing a plan.

The Community Health Steering Committee will work closely with an outside Resource Team. The Resource Team consists of representatives from the Oklahoma State Department of Health, the Oklahoma Office of Rural Health, the Area Health Education Center (AHEC) in the community's area, the Oklahoma Cooperative Extension Service, and the University of Oklahoma Health Sciences Center. The goal of the Resource Team is to create an interagency Resource Team available to assist Oklahoma rural communities with health planning and to create a process for rural communities to use to enhance local health care systems. The Resource Team offers technical assistance to the local community with the development, presentation and analysis of data and information, surveys, and health services and facilities as well as with analytical skills, facilitation skills, and strategic planning skills. The utilization of an outside Resource Team is necessary as the Resource Team is trained in the community development process and has health sector expertise. The Resource Team also has contact with other federal and state agencies and other organizations which may be able to provide special technical assistance and other resources.

Communities must fully understand their health care services and needs, as well as other factors that influence how health care services are provided, in order to make wise decisions in the planning process. To develop a strategic health plan, the Community Health Steering Committee will need information and data about the community and will need to communicate with the community. As specified in Figure 1, the Steering Committee will divide into four task forces which include:

1. Publicity,
2. Health Services and Facilities Inventory,
3. Community Survey, and
4. Data and Information.

The Publicity Task Force will provide news articles, radio announcements, and other public notices, including meeting notices for the Community Health Steering Committee

The Health Services and Facilities Inventory Task Force will gather detailed information on all health services and facilities provided within the community. A result of this task force could be a directory of health services and facilities in the community. The Resource Team can be helpful in gathering the basic health services and facilities data. However, the committee members will know the local services and facilities first-hand and will be critical in determining the accuracy and completeness of the directory.

The Community Health Survey Task Force will design a survey, have the survey conducted and analyzed, and will review the results of the survey analysis. This task force will determine the local community's opinions and needs related to the health care system by obtaining input and feedback from the community. The Community Health Survey Task Force will review the community survey results to determine the need for further community analysis of specific needs. The Resource Team can assist with conducting and analyzing a survey and can assist with the determination of the need for further community analysis.

The Data and Information Task Force will gather and analyze all current sources of data and information about the community's health care system. Demographic, economic, and health data and information are available from many different sources. The Resource Team can be helpful in gathering, presenting, and analyzing this data and information.

After the task forces (except for the Publicity Task Force) have completed their research and analyses, a final report with main points of emphasis from each task force will be presented to the complete Community Health Steering Community. The information from these three task forces will be reviewed and integrated and duplications eliminated. The Steering Committee will then determine the main points of emphasis to build a plan of action.

Research may be needed on some of the points of emphasis to determine what course(s) of action is (are) feasible. The Resource Team can assist with developing further information related to specific points of emphasis. Some examples of research requests based on the planning process in Oklahoma are:

- Feasibility studies for family practice physicians, OB-GYN specialists and pediatricians;
- Feasibility study for outpatient rehabilitation services; and
- Feasibility studies for adult day services.

After all items have been thoroughly researched, the Community Health Steering Committee will review the final information. A proposed plan of action

will be completed, with a timetable and specific steps of action for implementation.
The proposed plan of action will be shared with the community through a community-wide meeting (Figure 1) and through the news media. The communication and acceptance of the plan of action by the community is crucial for accomplishing results. All members of the community should have an opportunity to provide input, discussion, updating and/or altering of the plan. The Community Health Steering Committee will then modify and revise the plan. The final plan will include specific community assignments and deadlines. A system for reviewing the results of the plan of action must be determined, and follow-up is important for accomplishment of the plan.

The strategic planning process has been completed or is in process in about 20 counties or communities in Oklahoma. The process takes about nine months and is labor intensive as the Resource Team provides the data and guides the entire process. The outcomes have been exciting as the entire community gets involved in the process, and changes have and are occurring. Some examples of changes are:

- ❖ Attraction of an OB-GYN physician;
- ❖ Attraction of a pediatrician;
- ❖ Establishment of a rural clinic;
- ❖ Creation of an assisted living center;
- ❖ Educational programs to address teenage pregnancy problems; and
- ❖ Establishment of an outpatient adult day center.

Another side benefit that has occurred is that the planning brings together the providers, and this often results in coordination and cooperation in the delivery of services. The end result of the planning process is an involved and enthusiastic community and often more health services being provided at the local level. This greatly improves the quality of life for the residents and makes for a more viable community.

Example of a Health Feasibility Study

Before the plan can be written, it is imperative that the issue be analyzed. Some issues that were identified and ranked extremely high by the strategic health planning process are not economically feasible or may require additional resources. If this is the case, all data and facts must be known before action is initiated. Analyzing the issue may be quite simple or may be very difficult. Some issues will require technical assistance from experts outside the committee and community. Knowledge of where to obtain assistance and willingness to ask is important. The methodology involved in analyzing an issue is quite basic. It is outlined in Table 4. To illustrate this methodology, a primary care physician feasibility study, including the cost of establishing a pri-

mary care physician practice, will be presented. The information is designed to assist local decision-makers in assessing the need and potential for primary care physician services and in assessing the cost of establishing a new primary care physician practice. This illustration is based on AE-Paper No. AE-0005, "An Analysis of the Demand for Primary Care Physicians and of the Cost to Establish a Primary Care Physician Practice for Atoka, Oklahoma" [21].

Introduction

This example feasibility study will examine the need for primary care physicians in Atoka County, OK, and will estimate the costs and revenues associated with establishing a primary care physician practice in Atoka County, OK. Specifically, the study will:

- Determine the need for primary care physicians;
- Determine the medical service area and population;
- Estimate annual total physician office visits and annual primary care physician office visits;
- Estimate the total demand for primary care physicians in the medical service area;
- Estimate the costs and revenues to establish a primary care physician practice;
- Estimate capital costs;
- Estimate annual capital costs, annual operating costs and total costs;
- Estimate revenues based on type of visit;
- Estimate alternate collection rates; and
- Determine estimated net income.

No recommendations will be made. The information included in this report is designed to assist local decision-makers in assessing the need and potential for primary care physician services and in assessing the cost of establishing a new primary care physician practice.

Determine Need for Primary Care Physicians in the Atoka County, OK, Medical Service Area

To determine an estimate of the number of visits to primary care physicians, the medical service area was delineated as shown in Figure 2. The medical service area includes places where persons are most likely to use a physician in Atoka County. As shown in Figure 2, this area includes Atoka, Caney, Stringtown, Tushka, Wardville, and the surrounding rural area in Atoka County. Data from hospital admission records were used to help delineate the medical service area. The 1998 estimated population of the medical service area is shown in Table 5. The estimated 1998 population of the medical service area (Atoka County) is 13,200. These estimates were made by using 1998 U. S. Census population estimates [4].

The number of physician office visits generated in the Atoka County service area is estimated by using the service area population data and the data from state and national research [1,2,3]. Research shows the number of annual office visits for the specified age group breakdowns in Table 6. For instance, for males under age 15, the average number of physician office visits is 2.4 visits per year [1,3]. This average annual visit rate is applied to the populations for each gender and age group. Residents in the medical service area are estimated to make 40,325 total physician office visits (Table 6). Of these total physician office visits, 62.2 percent or 25,082 (40,325 x .622 = 25,082) will be made annually to physicians active in primary care patient care while the remainder will be made to specialists [1].

The total number of primary care physician office visits given various usage rates is presented in Table 7 for the Atoka County medical service area. If there is 90 percent usage of Atoka County primary care physicians by residents of the medical service area, an estimated 22,574 primary care physician office visits will be made annually in Atoka County. A primary care physician in Oklahoma has an average of 4,976 patient office visits annually and, therefore, it is estimated that Atoka County needs an estimated 4.5 primary care physicians (22,574/4,976 = 4.5) [1]. Atoka County currently has three primary care physicians. Given the estimated annual visits, it appears that Atoka County can support approximately one additional full-time primary care physician. Higher usage levels would indicate more physicians could be supported, and lower usage levels would indicate fewer physicians. All assumptions and local conditions must be taken into consideration by decision-makers before deciding if additional physicians could successfully locate in Atoka County.

Estimating the Costs and Revenues to Establish a Primary Care Physician Practice

If a prospective primary care physician were to consider locating in Atoka County, an estimate of costs, revenues and net income would be beneficial. Two alternative annual budgets for a solo practice are presented. Cost data are taken from a study of rural Oklahoma physicians with price adjustments based on the consumer price index for medical care [1,5]. The first alternative assumes that 2,500 visits are made annually and may be considered a first year budget. The second alternative assumes 4,500 visits. These could be considered first year (2,500 visits) and approximately second or third year (4,500 visits) scenarios for a new primary care solo physician practice. In both alternatives, it was assumed that a 1,500 square foot building was rented that would have three examination/treatment rooms.

Alternative 1 (2,500 Visits)

Alternative 1 assumes that 2,500 visits will be made annually to the primary care physician practice. Capital costs include equipment costs (Table 8) for the reception area, business office, examination/treatment rooms, laboratory, physician's office, and conference room/staff lounge. Table 8 identifies the typical equipment found in a solo practice clinic, as determined from research [1]. Equipment costs for the reception area are estimated to be $1,927; for the business office $24,604; for three examination/treatment rooms $26,202; for the laboratory $4,894; for the physician's office $3,435; and for the conference room/staff lounge $1,442. The total cost of equipment is estimated to be $62,505. Table 9 again shows the total capital equipment costs of $62,505. The annual payments for capital equipment are estimated to be $11,519 (principal and interest), assuming a 10-year loan at 13 percent interest.

Operating costs for the practice are based on research in Oklahoma [1]. Building expenses include rent, utilities, general maintenance, janitorial services, insurance on equipment, and other miscellaneous costs (Table 10). For Alternative 1, rent totals $12,385 annually, and the cost of utilities (electricity, gas, water, sewer and trash) is estimated to total $2,682 per year. Maintenance is estimated at $956 per year, and annual janitorial services are estimated to cost $2,866. Insurance on the equipment is estimated to be $313 per year, and a miscellaneous category of $1,500 is included to cover any additional expenses. The total annual building costs are estimated to be $20,702.

Office costs include items such as telephone, supplies, office equipment maintenance ,and billings (Table 10). Telephone costs are estimated at $3,022. The cost of office supplies depends on the number of office visits and is estimated at about $0.80 per office visit for an annual total of $1,412. Office equipment maintenance is estimated at $1,412. Billings are estimated based on approximately $0.43 per office visit for an annual total of $1,064. In addition, fees for professional services are budgeted at $2,298; auto expenses at $3,949; conventions and travel at $2,389; and professional dues and licenses at $2,500. Allowances are also made for bonding ($150), marketing ($1,664), and postage ($1,383). Total annual office costs are $21,826 for Alternative 1.

Medical costs are listed next in Table 10. Maintenance of medical equipment is estimated to cost $1,685 annually for Alternative 1. Costs of medical supplies are estimated at $1.90 per office visit and vary with the number of patients seen. For 2,500 visits, they are estimated at $4,755. Malpractice insurance is budgeted at $6,122. This cost should be examined closely by a prospective physician due to rapidly changing insurance rates. The costs for outside laboratory fees are estimated at $4,223 annually. Laboratory supplies vary by the number of patients seen and are estimated at $1.69 per office visit or $4,223 for 2,500 visits. The total medical costs for Alternative 1 are estimated to be

$16,785 annually.

Personnel costs are generally the largest expense for a physician practice. Many solo practices employ a Licensed Practical Nurse (LPN), a receptionist/bookkeeper, and a medical assistant (Table 10). The annual salary for an LPN is estimated to be $25,000; for a receptionist/bookkeeper $14,098; and for a medical assistant $18,214. Benefits of 25 percent have been estimated for an annual total of $14,328. The total cost for personnel with benefits is estimated to be $71,640 for Alternative 1.

Total annual operating expenses for Alternative 1 are $130,953. Local costs should be used to adjust these estimates if necessary. The total annual capital and operating expenses are estimated to be $142,472 for Alternative 1.

Gross income can be estimated by using the number of visits to the primary care physician and the average rate schedule. Previous research indicates the number of hospital, emergency room and nursing home visits per office visit [1]. These are considerably lower for new physicians than for more established physicians. In addition, the number of initial and routine office visits and the number of visits with additional charges can be estimated [1]. For example, initial office visits are estimated to be 14.9 percent of the total office visits (2,500 x .149 = 373 initial office visits) (Table 11). Routine office visits are 85.1 percent of total office visits or 2,128 routine office visits. Research also indicates the percentage of visits with additional charges is approximately 47 percent of total office visits or 1,175 visits with additional charges. The percentage of hospital visits is estimated at 8.6 percent of total office visits or 215 hospital visits. Emergency room visits of 205 represent 8.2 percent of total office visits, and nursing home visits of 90 represent 3.6 percent of total office visits. Nursery visits of 43 represent 1.7 percent of total office visits, and home visits of 105 represent 4.2 percent of total office visits. All of these percentages were derived from research [1].

The average rates and ranges charged for each category of physician visit are shown in Table 11. These are based on 1991 survey data adjusted based on the consumer price index [1,5]. These rates should be examined closely to determine if they reflect local conditions. Table 11 further shows the total estimated revenues (or total billings) for one physician with 2,500 office visits using the high, average and low rates indicated. The rates were multiplied by the estimated number of visits to determine the total estimated revenues for Alternative 1. For example, using the average rates for visits, total revenues equal $159,805 for one primary care physician with 2,500 office visits.

To show different collection possibilities, Table 13 shows the total revenues generated assuming a 95 percent, 90 percent, 85 percent, 80 percent, 75 per-

cent, or 70 percent collection rate. To illustrate Table 13, if 90 percent of the average total revenues were collected, total collections would be $143,825 for Alternative 1. To show estimated bottom-line net income for Alternative 1, Table 14 shows that net income would equal $1,353 based on the assumptions that 90 percent of the total average revenues are collected ($143,825) and that total annual capital and operating costs are $142,472. As illustrated in Table 14, the first year of practice may be difficult financially, given the assumptions presented.

Alternative 2 (4,500 Visits)
Alternative 2 differs from Alternative 1 with the number of office visits increasing to 4,500. Thus, only those costs based on the number of patients seen (office supplies, billing and postage expenses, medical supplies, and laboratory fees) will be higher than in Alternative 1. For 4,500 visits, office supplies will increase to $3,591; billing costs to $1,915; postage expenses to $2,489; medical supplies to $8,559; and laboratory supplies to $7,601. Total annual operating costs for Alternative 2 are estimated at $138,666. With the total capital costs and the annual capital costs remaining the same as Alternative 1, the total annual capital and operating costs are estimated to be $150,185. Local costs should be used to adjust these estimates if necessary.

The percentage of office visits for the specified type of visit is the same as Alternative 1; however, these percentages are applied to the higher number of estimated office visits of 4,500 (Table 12). The estimated revenues or billings are calculated the same as in the first alternative. The average total revenues generated are estimated at $287,574. Assuming a 90 percent collection rate, the average collected revenues would be $258,817 (Table 13). To show the bottom-line net income, Table 14 shows a net income of $108,632 based on the assumptions that 90 percent of the total average revenues are collected ($258,817) and that total annual capital and operating costs are $150,185. Alternative 2 is based on the scenario of 4,500 physician office visits, and this scenario is realistic probably two to three years into a new primary care physician practice.

Summary Comments on Primary Care Physician Feasibility Study

Many assumptions have been made in the preceding analysis. These include items that may change such as service area delineation, type of practice, capital equipment, number of office visits, and rate schedule. For example, the service area depicted here may change due to the exit or entry of physicians from nearby communities. Should this occur, revised estimates of physician office visits should be made.

All assumptions should be closely examined by local decision-makers to verify that they reflect local conditions. If additional local data are available, they

should be included to arrive at the most realistic analysis possible. If further analysis is needed, contact your County Extension office.

Summary of Feasibility Example

The example clearly demonstrates the need for an accurate analysis of each issue. As community decision-makers face each issue, it may be useful to know what type of feasibility studies have been completed through the development of existing community health plans. The basic data behind these studies will transfer to other communities and make the job of analyzing an issue much easier. The subject areas where analysis has been completed are presented in Table 15.

The goal of the presentation was to briefly review the importance of getting the entire community involved and to describe how issues are identified and prioritized. The main goal was to demonstrate how an issue must be analyzed before an action plan can be written. It was demonstrated that the need had to be projected, capital and operating costs had to be estimated, revenue had to be estimated, and if the issue did not break even, some method to finance the solution had to be identified. The bottom line is that a careful analysis must be completed before a plan can be written.

References for Primary Care Physician Feasibility Study

[1] Doeksen, G., K.A. Miller, P.J. Shelton, and D.A. Miller. (1990). "Family Medicine – A Systematic Approach to the Planning and Development of a Community Practice," University of Oklahoma Health Sciences Center.

[2] Miller, K.A., G. Doeksen, D. Miller, J. Campbell, and P.J. Shelton. (1993). "Internal Medicine - A Systematic Approach to the Planning and Development of a Community Practice - A Step-by-Step Guide," University of Oklahoma Health Sciences Center.

[3] U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center of Health Statistics. "National Ambulatory Medical Care Survey: 1997 Summary," No. 305, May 20, 1999.

[4] U. S. Census of Population, Population Estimates Branch, 1998.

[5] U.S. Congress, Joint Economic Committee, Economic Indicators, April 1998, p. 23.

Selected References

[6] Alward, G., E. Sivertz, D. Olsen, J. Wagner, D. Serf, and S. Lindall. (1989). *Micro IMPLAN Software Manual.* University of Minnesota Press.

[7] Chirilos, T. N. and G. Nostel. (1985). "Further Evidence on the Economic Effects of Poor Health." *Review of Economics and Statistics,* 67(1), 61-69.

[8] Christianson, J. B. and L. Faulkner. (1981). "The Contribution of Rural Hospitals to Local Economies." *Inquiry,* 18(1), 46-60.

[9] Doeksen, G. A., J. F. Schmidt, K. Goodwin, G. Sloggett, and D. Cummens. (1993). "A Guidebook for Rural Solid Waste Management Services." Southern Rural Development Center Publication No. 174.

[10] Doeksen, G. A., K. A. Miller, P. J. Shelton, and D. A. Miller. (1990). "Family Medicine – A Systematic Approach to the Planning and Development of a Community Practice." The University of Oklahoma Health Sciences Center.

[11] Doeksen, G. A., K. A. Miller, P. S. Jacobs, and D. A. Miller. (1990). "A Systematic Approach to the Planning and Development of a Practice – A Guidebook for Pediatricians." Printed courtesy of Wyeth-Ayerst Laboratories, Pediatrics and Consumer Health Care Division.

[12] Doeksen, G. A., R. A. Loewen, and D. A. Strawn. (1990). "A Rural Hospital's Impact on a Community's Economic Health." *The Journal of Rural Health,* 6(1), 53-64.

[13] Doeksen, G. A., S. Cordes, and R. Shaffer. (1992). *Health Care's Contribution to Rural Economic Development*. Unpublished paper prepared for Federal Office of Rural Health.

[14] Doeksen, G. A., T. Johnson, and C. Willoughby. (1996). *Measuring the Economic Importance of the Health Sector on a Local Economy: A Brief Review and Procedures to Measure Local Impacts.* Southern Rural Development Center Publication No. 202.

[15] Doeksen, G. A., V. Schott, D. Holmes, et al. (1996). "Preliminary Analysis of an Outpatient Rehabilitation Facility for Tahlequah, Oklahoma." Oklahoma Cooperative Extension Services, Rural Development, AE-Paper 9693.

[16] Eilrich, F., C. F. St. Clair, G. A. Doeksen, et al. (1996). "Preliminary Analysis of the Feasibility of an Adult Day Care Center in Madill, Oklahoma." Oklahoma Cooperative Extension Service, Rural Development, AE-Paper 96101 (Draft).

[17] Erickson, R.A,. N.I. Gavin, and S. Cordes. (1986). "Service Industries in Inter-Regional Trade: The Economic Impacts of the Hospital Sector."

Growth and Change: A Journal of Public, Urban, and Regional Policy, 17(1), 17-27.

[18] Kleinholz, S. and G. A. Doeksen. (1991). "The Impact of Rural Hospitals and Rural Physicians on the Economy of a Rural Community." Paper presented at the 1991 Western Multi-Conference on Simulation in Anaheim, CA.

[19] Kleinholz, S., G. A. Doeksen, et al. (1990). "A Guidebook for Rural Fire Protection Services." Cooperative Extension Service, Oklahoma State University, MP-131.

[20] Knowles, E. and G. Doeksen. (1987). "A Guidebook for Rural Public Transit." Oklahoma State University Cooperative Extension Service, MP-123.

[21] Lawler, M. K., C. F. St. Clair, G. A. Doeksen, S. R. Ralstin, and R. A Devore. (2000, January). "An Analysis of the Demand for Primary Care Physicians and of the Cost to Establish a Primary Care Physician Practice for Atoka, Oklahoma." Rural Development, Cooperative Extension Service, Oklahoma State University, AE-Paper No. AE-0005.

[22] Lyne, J. (1990). "Health Care and Education: Important QOL Factors, but Who's Accurately Measuring Them?" *Site Selection*, 35(5), 832-838.

[23] Lyne, J. (1988). "Quality-of-Life Factors Dominate Many Facility Location Decisions." *Site Selection Handbook,* 33, 868-870.

[24] McDermott, R.E., G.C. Cornia, and R.J. Parsons. (1991). "The Economic Impact of Hospitals in Rural Communities." *The Journal of Rural Health*, 7(2), 117-132.

[25] McGuire, T. (1986). *On the Relationship Between Infrastructure Investment and Economic Development.* Stoney Brook: State University of New York.

[26] Miller, K. A., G. Doeksen, D. Miller, J. Campbell, and P. J. Shelton. (1993). "Internal Medicine – A Systematic Approach to the Planning and Development of a Community Practice." The University of Oklahoma Health Sciences Center.

[27] Office of Rural Health Policy, Public Health Service, USDHHS. (1991). *On the Move: Innovations in Rural Health Care Delivery.*

[28] Oklahoma State Department of Health. (1995). *Guidebook on Strategic*

Health Planning in Oklahoma Communities.

[29] Pomeranz, W. (1988). "A Rural Long-Term Cary System Model." *Health Issues in Rural America,* Chapter 3, National Governor's Association.

[30] Reginer, V. and L.E. Gelwicks. (1981). "Preferred Supportive Services for Middle to Higher Income Retirement Housing." *The Gerontologist,* 21(1), 54-58.

[31] Scott, L. C., L. H. Smith, and B. Rungeling. (1997). "Labor Force Participation in Southern Rural Labor Markets." *American Journal of Agricultural Economics,* 59(2), 266-274.

[32] Serow, W. J. (1987). "Determinants of Interstate Migration: Differences Between Elderly and Non-Elderly Movers." *Journal of Gerontology,* 42(1), 95-100.

[33] Sloggett, G., G. A. Doeksen, M. Hays, and S. Larsen. (1988). "A Community Development Guide for Emergency Medical Services: A Systematic Approach to Funding and Administration." EMS Division, State Health Department; Oklahoma Highway Safety Office, Oklahoma Cooperative Extension Service, Oklahoma State University, MP-126.

[34] Toseland, R., and J. Rasch. (1978). "Factors Contributing to Older Persons' Satisfaction with Their Communities." *The Gerontologist,* 18(4), 395-402.

[35] Turner, K. K.and F. Mallory. (1991). *Economic Impact Study – Saunders County Community Hospital*. Report prepared by College of Business Administration, University of Nebraska, Omaha, NE.


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