

# Competition and Rural Primary Care Programs

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## Abstract

Rural primary care programs were established in areas where there was thought to be no competition for patients, however, evidence from site visits and surveys of a national sample of subsidized programs revealed a pattern of competitive responses by the clinics. In this study of 193 rural primary care programs, mail and telephone surveys produced uniform data on the organization, operation, finances, and utilization of a representative sample of clinics. The programs were found to compete in terms of: (1) price, (2) service mix, (3) staff availability, (4) structural accessibility, (5) outreach, and (6) targeting a segment of the market. The competitive strategies employed by the clinics had consequences that affected their productivity and financial stability. The strategies were related to the perceived missions of the programs, and depended heavily upon the degree of isolation of the program and the targeting of the services. The competitive strategy chosen by a particular program could not be predicted based on service area population and apparent competitors in the service area. The goals and objectives of the programs have more to do with their competitive responses than market characteristics. The chosen strategies may not meet the demands of those markets.

## **COMPETITION AND RURAL PRIMARY CARE PROGRAMS**

Competition and competitive systems have become the focus of many policy proposals aimed at slowing the rate of increase of health care costs. Clinicians and managers are faced increasingly with situations where being open is not enough to guarantee fiscal survival. The new emphasis on competition comes from two sources. The first is competition directed by policy initiatives, prompted by runaway costs in the health care system. Government programs have grown beyond all expectations and government trust funds and third-party insurers are threatened by increases in costs. Since this problem of escalating costs has not yielded to government regulation, policy-makers have turned increasingly to competition in price and services as a means of controlling costs. Competition has also increased due to true market forces—a rapid increase in the number of providers, the ending of constraints on competition imposed by professional associations through Federal Trade Commission rulings, the growth of new organizational forms such as HMOs and PPOs, and the actions of employers and insurers to control health care costs.

This article focuses on the competitive behavior of a national sample of rural primary care programs that were subsidized by a government agency or external organization at some time in their lives. The sample of programs described here were part of a larger national evaluation that analyzed their organization, finances, responses to environmental and regulatory changes, and impacts on access and health status. Complete descriptions of that evaluation have been published elsewhere (Sheps, Wagner, et al., 1983; University of North Carolina, 1983, 1985; DeFries and Ricketts, 1989).

## **Background**

Prior to the recent emphasis on competition as a solution to the problem of rising costs, the health economics literature described health and medical service delivery as unable to operate successfully in a market system. This was generally described as due to four major barriers:

1. Legal barriers to entry, such as licensure;
2. Professional constraints, such as control of medical school enrollments, hospital privileges, common fee schedules, membership on Blue Shield boards, and independent practice association price controls—all aspects of restricted entry into the market or of price fixing;
3. Inadequate consumer ability to make decisions, including lack of information from advertising, forcing the public to leave decision-making to professionals; and
4. Public policies which favored regulatory or nonmarket approaches to holding down costs, such as health systems agencies, certificate-of-need, and rate setting bodies (Federal Trade Commission, 1978).

Siminoff has recently argued that these conditions hold equally for the primary care segment of health care but because the equitable distribution of primary care is so important as a societal goal, an extra threat is introduced by applying market-based solutions where underserved populations may be affected (Siminoff, 1986)

During the Carter Administration and into the early 1980s, competition was seen as a better alternative to regulation to curtail rising costs. Legislative initiatives supported health maintenance organizations, existing certificate of need legislation was modified to encourage competitions, and several comprehensive plans were put forward describing how competition might be introduced into health care markets directly or on a modified basis (Enthoven 1978, 1981). The most important component of these proposals was the introduction of choice of financing options rather than choice of provider and the financing alternatives were usually some form of HMO or preferred provider organization (PPO). Feldstein (1983) and the National Center for Health Services Research (1982) have reviewed this early literature. These reviews reached the tentative conclusion that physicians would compete given a conventional market for their services using traditional price and non-price factors, but more likely on the latter. The National Center for Health Services Research synthesized the literature in these words:

There is only extremely limited evidence that suggests that price competition is a major factor in the market for physicians' services. Restrictions on advertising and other conditions which affect the ability of consumers to obtain price information in this market may account for the low level of price competition observed (NCHSR, 1982).

No comprehensive systems have yet been adopted in this country to guide competition and the partial efforts to increase competition have not met with much overall success.

There is evidence, however, that non-price factors do make a difference in demand for health services and their utilization. These non-price factors include travel time, waiting time, perceived quality, practice setting, service mix, and

marketing efforts. A number of empirical studies have focused on the first five of these factors, but little attention has been given to the last.

Thus far, empirical research on the effects of competition and marketing has focused on such large-scale issues and organizations including potentially competitive insurance plans, HMOs, hospitals, and alternative payment schemes (Feldstein, 1988). Little systematic analysis of competition has been carried out in small medical organizations and especially small, rural primary care clinics. With few exceptions, there has been little economic research that discusses the competitive interactions among physicians in small or dispersed communities. Studies of the interactions between medical providers in rural communities has focused mostly on the effects on access for patients (Cowper, 1987) or the structure of the service system (Fickenscher, 1988). Where there are analyses of competitive interactions they usually take the form of case studies and there are numerous case descriptions of the implementation of individual health care programs in rural communities (Cowen, et al., 1976; Bernstein, Hege, Farran, 1979), cookbook-style planning documents that allow planners to estimate a given community's need for a physician (Rowley and Baldwin, 1984), and economic analyses that focus on cost and production functions of clinics (Goldman and Grossman, 1982; Bradham, 1981). None of these focus directly or primarily on the measurement of competitive effects or the mechanisms by which clinics and physicians compete.

Marketing, meanwhile, has been touted by practice managers and clinicians alike in trade publications such as Medical Group Management, Health Care Management Review and AMA News. Marketing is now considered a legitimate concern not only for professionals in general but for health professionals in particular (Sheldon, 1984; MacStravic, 1977; Cooper, 1979). In primary and ambulatory care, the focus of this evaluation, the trend toward greater use of marketing also applies (MacStravic, 1977, 1981; Cooper, et al., 1979; AMA, 1984). The

fundamentals of marketing in this area are considered similar to marketing elsewhere. The fundamentals include: (1) market research; (2) product planning or service mix; (3) pricing; (4) advertising; (5) sales; and (6) distribution (Bohlmann, 1981).

In a study of the performance of subsidized rural primary care programs it might initially appear that the issues of competition and marketing are not significant. The clinical programs being evaluated were designed to meet the needs of communities with apparent and measurable unmet need and/or demand for medical services; these conditions eliminated, in theory, the potential for competition for patients and the need to invest in any marketing strategy beyond the opening of the new clinic.

Yet competition in these programs' environments cannot be ignored. Many of the subsidized programs were seen as threats by other local providers. In 1979, as the first data collection step in the National Evaluation of Rural Primary Care Programs, 939 such programs were surveyed and 34.2 percent reported that there had been some or severe opposition from local providers and provider groups in their local communities. In 1981, 29.7 percent of a smaller sample of programs responding to a follow-up to that original survey reported such opposition. Information developed from subsequent site visits to 40 representative programs indicated that opposition was often, but not always, economically based. Local or nearby physicians seemed to perceive the subsidized programs as competing for patients.

The philosophy of some subsidy programs in health included explicit efforts to improve access to health care through marketing efforts to reach more eligible clients. The O.E.O. Neighborhood Health Centers and, to a lesser extent, the DHEW-DHHS Community Health Center (CHC) programs strongly encouraged marketing approaches. The employment of outreach workers in what can be interpreted as a



marketing role has been encouraged by advocates of community-oriented primary care approaches, and many of these programs are located in rural communities (Hartye and Andrews, 1987). Organized programs of screening, diagnosis and treatment; community boards; fund-raising efforts; health fairs; newsletters; and involvement of providers in local civic, educational, and cultural affairs could potentially be added as aspects of non-profit, community-based programs that function as marketing strategies. Today, these activities are recognized as legitimate marketing devices that could be used by private medical clinics. Whether these activities, if adopted by rural primary care programs, subsidized or not, were undertaken to compete with other providers or to overcome more effectively the resistance of a needy population, would be useful information but difficult to distinguish from the available survey data. Data from the National Rural Primary Care Evaluation can, however, be used to examine activities and costs affecting competition, but not their underlying intent.

### **Data Sources**

The National Rural Primary Care Evaluation Project was undertaken in 1977 by the Health Services Research Center of the University of North Carolina at Chapel Hill with the support of the Robert Wood Johnson Foundation and the Office of the Assistant Secretary for Health (Planning and Evaluation) to determine what the overall effect was of the wide array of programs meant to improve access to primary care among rural, underserved populations. The National Evaluation began with an effort to establish a comprehensive inventory of subsidized rural primary care programs sponsored by both public and private sources in the United States. Listings of projects supported by private foundations, state governmental agencies and federal programs were compiled. At the outset of the study, the inventory

included over 1,300 separate organizations or programs supposedly offering primary health care services and having received some form of subsidy in order to begin or continue their operations. Efforts to estimate the extent to which the inventory actually included all such programs were made in several states where experts known to have first-hand local knowledge of such programs were asked to examine the inventory compiled by the Evaluation for their state. From this process it was estimated that the national inventory contained more than 90 percent of all potential rural primary care programs that had some form of subsidization at some time in their operation.

Using this list, a national telephone survey was conducted of all known rural primary care programs. After elimination of unqualified and duplicated programs, this sample included 939 programs and was called the Tier I sample by the Evaluation. The telephone survey process led to the identification of slightly more than 400 programs which were eligible for inclusion in the study based on criteria related to rural practice location, size of program, length of operation, and primary care program activity. From that group, a smaller sample of 193 programs (Tier II) was selected for detailed study by mailed questionnaire with telephone follow-up. Each of these programs was asked to provide data pertaining to a substantial list of descriptive indicators of program operation, history of program development, personnel, financial operations, and characteristics of patient populations. From this group of clinics, a smaller panel (Tier III) of 40 programs was selected for on-site visit by a team of two or three persons from the University of North Carolina. At this stage, the sample of 40 sites was stratified by size and structure of program, geographic location (only clinics in the Mid-Atlantic, South, and West regions of the country were selected), and by

characteristics of the organizational structure of these programs determined from the Tier II analyses. In addition to on-site visits to the 40 Tier III programs, community-based population surveys (Tier IV) were conducted by telephone using a random-digit dialing procedure in order to measure the extent to which these clinics were regarded as important sources of primary care by the population served and whether persons in these communities who actually used these services had different health care utilization experiences and health status indicators than did persons who were non-users of these services.

The evaluation identified four distinct organizational forms that would characterize rural primary care programs. Those forms differed not only in structure, but on important measures of process and performance (Sheps, Wagner, et al., 1983). The forms of primary care program organization identified in the Evaluation were:

1. Institutional Extension Practices (IEPs): primary health care programs developed by existing institutions such as hospitals, health departments, group practices, etc. The leading example of this approach is the W. K. Kellogg Foundation-supported Innovative Ambulatory Primary Care Award Program. There are also rural satellites developed by health departments, established group practices and university medical centers or Health Underserved Rural Areas (HURA) projects sponsored by DHHS.

2. Comprehensive Health Centers (CHCs): primary health care programs characterized by comprehensive program development on a relatively large scale, together with substantial community involvement and control. Social and health objectives are to be achieved by a relatively broad

range of non-clinical services to support and extend the impact of basic medical services. Examples are the neighborhood health centers and family health centers (mainly supported by DHHS), of which a sizeable number serve rural populations.

3. Organized Group Practices (OGPs): primary health care programs which consist of at least two full-time physicians in group practice operating autonomously, through a pooled income arrangement, not providing any outreach services. Some, like the practices fostered and supported by the Robert Wood Johnson Foundation Rural Practice Project, emphasize leadership by physicians, sophisticated administration and staff development.

4. Primary Care Centers (PCCs): smaller primary health care programs stimulated and/or subsidized by indigenous community initiative, with or without financial assistance from outside the community, and often involving the use of new health professionals with physician backup, on-site or elsewhere. There is usually no formal institutional affiliation.

5. Other Forms of Practice (Other): In very few cases, the characteristics of a single-site program may be such that it cannot be classified into one of the other four forms. In such circumstances, it is classified as "other." The placement of an isolated physician in a community, with no other support, has been the traditional approach to rural health care delivery, and is intended to be included in this category.

## Analysis

A majority of the programs in the Tier II sample, which will be the focal group of programs in this article, were located in communities where the potential for direct competition with other providers existed; 98 percent had at least one other physician in their service area. In the initial survey each of the programs was asked to indicate the number of primary care physicians, physicians' assistants, and nurse practitioners who practiced within a 30-minute drive of its delivery site. In the follow-up survey programs were asked again for the number of primary care physicians and new health practitioners in their service area and within a 30-minute drive from the site. The responses are summarized in Table 1.

The proximal presence of other practitioners presents the potential for competition to a program, but the relative potential for a share of the market depends upon the proportion of the area's provider population employed by the program. This latter measure, called dominance (DOMINANC) was calculated by dividing the number of full-time equivalent (FTE) physicians working in a program by the number of practitioners within a 30-minute drive or in the service area. The three measures of dominance are summarized in Table 2. In the analysis of competitive environments the measure of dominance was based on the number of providers in the programs' identified service areas. It should be noted that not all clinics and providers compete for the same populations in any given community; there may be an effort to target populations, especially by community health centers and migrant health centers. Fifty clinics, or approximately a quarter of the Tier II sample, serviced a specific segment of their service area population. This was reflected in the racial and ethnic makeup of the programs' users when compared to total service area populations. As described later, it was these targeted clinics that

were most costly to operate, had the highest total costs, and operated with the highest subsidies.

### **Competitive Strategies**

Medical practices can compete in four major ways: (1) through prices and pricing mechanisms, such as sliding fee scales based on need; (2) through structural access mechanisms, such as hours of service; (3) through the mix of services provided; and (4) by providing better quality of care that is recognized by the patients and potential patients. The analysis was able to operationalize the first three competitive strategies; assessments of quality were not made in the Evaluation and levels of quality are difficult to determine in ambulatory care. In the first case, price, the obvious mechanism of competitive strategy would be to alter the price charged.

Price. Charge data were collected from all 193 programs for: (1) a routine office visit for a regular patient; (2) a comprehensive initial office visit; (3) a hematocrit; and (4) an injection for allergy. These data were combined into a single variable, CHARGE, which was calculated for each clinic. The real price of services to patients is, however, the amount each patient must ultimately pay. This real price is reflected in the CHARGE variable; PERSLIDE, the percentage of patients using the sliding fee scale; COLPOL, the collection policy of the clinic based on emphasis on payment at the time of visit, write-off procedures, and the use of a collection agency; and COLRATE, the percentage of patient bills that were collected (paid) during the survey year.

Structural Access. A clinic has the opportunity to make its service more convenient to its patients by offering extended hours in the evening and on weekends, as reflected in the variable SITEHOUR, an ordinal index of hours of operation. Likewise, the clinic may arrange to have personnel and services more available when the clinic is closed, reflected in AHCVINDX, an index of the extent

of after-hours coverage available. A clinic may provide transportation, TRANSPOR; outreach, OUTREACH; or some organized program of screening, diagnosis, and treatment, ORGPROG (0-1 variables). These activities closely resemble what is considered a traditional marketing mix applied through the active solicitation of clients or patients.

Service Mix. All clinics in the study must have, by definition, provided a basic set of primary care services reflected in the generally accepted primary care practice patterns of a general nurse practitioner, family physician, pediatrician, and/or internist. However, those services might be extended to include social services, mental health, home care, dental care, family planning, prenatal care, or inpatient services. The scope of services was reflected in the variables ordinal scale variables PRICARE2, PRICARE4, and the percentage variable HOSPCOV, which indicated the percentage of a program's users who were hospitalized and treated by program staff as inpatients. The presence of an organized outreach program, ORGPROG, could also be included in this group of service offerings.

Auxiliary services such as x-ray, laboratory, and pharmacy services, might also be used as marketing approaches to increase patient use by extending the range of services offered. The extent to which these were offered by programs was reflected in the variables LABINDX (laboratory/x-ray index of services) and PHARMACY, a scale of pharmacy services available at the clinic.

A commonly used measure of efficiency in firms is the cost per unit of output produced. Costs are usually described by the total expenditures of the firm for operation less capital expenses. In the evaluation, efficiency was measured by several cost and revenue ratios with the patient encounter counted as the unit of production. Cost determinations were based upon the accounting rules set up by the Bureau of Health Care Delivery and Assistance in its regulations guiding the Bureau Common Reporting Requirements (BCRR) reporting forms. BCRR data or their

equivalent were used in calculating costs, revenues, and encounter formulas for the Tier II sample. The medical encounter, that is, encounters with physicians or physician surrogates (nurse practitioners, physician's assistants, or the like), was identified as the primary measure of productivity and the analysis separated out dental, pharmaceutical, and other allied health encounters. A corollary measure of efficiency based upon revenues per encounter with the same distinction between medical and other revenues was not possible in the analysis. Five ratios were used as dependent variables: (1) total costs per encounter including all encounters (TCOST/TENC); (2) total costs per medical encounter (TCOST/MENC); (3) medical costs per medical encounter (MCOST/MENC); (4) revenue per encounter including all encounters (REV/TENC); and (5) revenue per medical encounter (REV/MENC). A summary of these variables and the cost and revenue variables is included in Table 3. The effect of the addition of each of these potential marketing aspects on costs and revenues was explored in correlation and regression analysis. Table 4 displays the pair-wise correlation coefficients of each of the competitive aspects with the five ratios. Table 5 includes a summary of five regressions models using all of the competitive strategy variables as independent variables and each of the ratios as dependent variables.

From these analyses it is clear that marketing strategies that involve the addition of services and staff, (e.g., transportation; outreach; organized programs of screening and diagnosis; laboratory; pharmacy; and support services, including dental, home care, and social work), were associated with increases in the total costs of operating a clinic. Likewise, the greater use of a sliding fee scale was associated with higher total program costs per encounter but not with higher medical costs per encounter.

The extent to which clinical staff in a program attend to their patients while the patients are admitted to hospitals is marginally related to lower total costs per



total encounters. This effect is probably due to the shifting of x-ray, laboratory, and other overhead costs related to inpatient treatment onto the hospital while the clinic still receives revenue. This potential effect is explored in detail by McLaughlin, Ricketts, Freund, and Sheps (1985) where the possibility of a symbiotic relationship between clinics and hospitals is discussed. Interestingly, more extensive after-hours coverage provided by the clinic is related to lower cost. This effect is strongest on the inpatient cost component, a finding which indicates that after-hours coverage is related to hospital use and may reflect a pattern of mandated coverage by the hospital. What a program charges for its services shows no relation to costs.

The application of more effort expended in patient fee collection, perhaps having a reverse effect compared with other marketing strategies, is associated with higher revenues. On the other hand, increased use of sliding fees markedly reduces total clinic revenues as indicated in Tables 4 and 5. While the addition of laboratory services is associated with higher costs it is also associated with higher revenues. After-hours coverage also relates to higher revenues, but the hospital relationship does not appear directly related to income.

The variables examined above reflect various aspects of the marketing practices of once and currently subsidized rural primary care clinics which, either separately or in some combination, are used by programs attempting to compete in local health services markets. While their net effects upon costs and revenues show that not all of these strategies contribute to the financial well-being of a clinic, their use may be either required by a funding agency or be a part of the social mission of the clinic. The analysis of relationships between individual strategies and measures of efficiency suggested some relative advantages and disadvantages of each approach but did not describe how certain combinations of marketing or competitive activity might produce favorable net effects. An attempt was made using factor analysis to

determine whether these approaches clustered into more or less efficient combinations.

### **Competitive Factors**

This portion of the analysis was done using principal components and rotated factor analysis. The competitive strategy variables were examined for underlying factor patterns in two groups: one group included all 14 of the variables described above and the other omitted the collection policy and collection rate measures. The analysis discriminated between the two groups because the collection variables seemed to represent activities counter to the conventional thrust of marketing; that is, they consisted more of management rather than marketing decisions.

The larger group of variables (including the collection activities) produced a five-factor pattern and the smaller group a four-factor pattern. The two sets of factors offer similar interpretations. The factor coefficients for both are summarized in Tables 6 and 7. Both represent varimax rotations of a principal components factoring method and the number of factors was limited to those with a contribution to factor communality of 1.0 or greater.

Both factor patterns segregate the variables of PERSLIDE, OUTREACH, and TRANSPOR which, from the prior regression analysis, indicate they are net drags on program efficiency. In the 12-variable factor, the support service variable PRICARE4 joins PHARMACY in this factor. The underlying factor in both appears to be a strategy related to comprehensive care for a segmented or targeted population that is poor. The second factor in both analyses relates to structural services availability that might be interpreted as structural access. In the 14-variable analysis, the collection posture of the clinic dominates the third factor in tandem with programs that do not dispense drugs. These might be more traditional practices and are a complement, though not a relative, of the fourth factor of the same 14-variable

analysis (Table 6) which emphasizes hospital activity and high charges. This factor seems to reflect traditional clinics which depend on patient fees and hospital activities for revenue. The final factor in both cases reflects competitive outlooks that resemble those of health department strategies that combine screening and diagnosis with regular hours and no backup. These programs tend to be in the more urban locations. The entry of the CHARGE variable in this factor for the smaller group may reflect a strategy that includes higher fees for primary care services or a high intake fee.

### **Competitive Environment**

Competition exists for a clinic or primary care program because of the nature of its environment, specifically, the presence of alternative sources of care in its service area or other sources that attract patients. In this section the competitive environment is examined, with emphasis placed on the effects of competition on costs and revenues.

The Tier II survey included questions about the number of primary care physicians and new health practitioners that were practicing in the programs' self-defined service areas. Programs were also asked the distance to the nearest hospital; whether there was a health department in the service area; the distance to the nearest pharmacy; the extent to which the service area had dental, family planning, home care, mental health, prenatal, and social services; and whether or not providers in the service area refused treatment of indigents, Medicaid patients, migrants, or minorities.

The questions listed above were translated into direct indicators of competitive influences on these primary care programs. They included: dimensions relating to referral to secondary care, distance to hospital (HOSPMILE); the availability of referral to other aspects of primary care in the service area

including dental, mental health, and social services represented by external primary care services (EXTSERV), and the presence of a health department in the service area (HLTHDEPT); distance to a pharmacy (PHARMILE); characteristics and number of direct competitors in the service area (DOMINANC); refusal by other practitioners to treat certain classes of people in the service area (REFSERV); and an overall measure of demand, the physician-to-population ratio in the county where the program was located (ARFMDPOP). All measures related to the primary site if the program had multiple sites and variables were adjusted to reflect the target site.

To test whether these variables measured a single underlying dimension of the competitive market facing rural primary care clinics, they were analyzed in a factor analysis. The varimax-rotated factor pattern and coefficients are displayed in Table 8.

Factor one presents a fairly clear view of isolation versus proximity to other physicians and the hospital on the part of the clinics. The variable REFSEV may be more related to the number of other physicians who might be able to afford to refuse low paying or low-reimbursement patients rather than the actual refusal by service area physicians. Likewise, the absence of other primary care services and a greater distance to a pharmacy reflect this dimension of the competitive environment.

Factor two, rural underservice, represents a situation less dependent upon geographic location where the community already has access to a health department and other primary care providers, is proximal to a pharmacy, but is underserved due to a low overall physician-to-population ratio. This situation would make competitive patterns more idiosyncratic.

The two competitive environment factors were weakly correlated with the competitive strategy factors drawn from the 12-variable analysis . There was a significant positive correlation between competitive strategy, Factor 2 (structural service availabilities ) and competitive environment Factor 1

(isolation/proximity) (0.2011,  $p \leq 0.01$ ), that indicated that structural access defined by the relative availability of providers and laboratory/x-ray services is more prevalent in programs in more isolated service areas. The significant negative relationship (0.1681,  $p < 0.05$ ) between competitive strategy Factor 3 (hospital orientation) and the same environment factor (isolation/proximity) appeared to be a function of the relatively low hospital use for isolated clinics.

The interactions of these two groups of factors were predictable and follow the logic of the effect of distance upon use of services. However, the fact that the service and access variables chosen *a priori* as aspects of an overall competitive strategy did not combine to a single, or even a dual, factor indicates that those activities are undertaken by the programs for reasons that may not be related to competition. The environment variables, however, tell a slightly different story. The clustering of five of the seven variables into one factor and the remainder into a second indicates that the underlying dimension hypothesized for those variables may indeed exist as a function of the competitive environment. If so, then the sensitivity of competitive strategy Factors 2 and 3 (12 variables) to the first community factor (isolation) indicates that the variables making up those factors are true competitive strategies in the framework of our sample. Operating hours, after-hours availability, and the extent of laboratory and x-ray services at the clinic represent more discretionary activities that a clinic might undertake to improve its competitive position in a market. The third competitive strategy factor (12 variables) combining hospital coverage and the tendency not to use an organized program of screening, diagnosis, and treatment represents the discretionary use of a proximal hospital by the provider staff where local practice patterns excluded marketing activities or outreach.

The relative dominance of a clinic in a competitive environment was examined as part of this analysis of competition, but the extent of its influence on

the costs, revenues, and productivity of the clinics appears to be masked by other factors. The influence of other providers in a program's service area on the financial indicators of clinic success as measured by productivity (encounters per physician or total staff), efficiency (costs per encounter), or self-sufficiency (revenues divided by costs) revealed a non-linear pattern dependent on the size of the service areas measured by population. These same outcome variables were also very sensitive to the number of minorities served by the programs. In areas that targeted a specific segment of the service area population, especially minorities, there were significantly lower clinic revenues, higher costs, and differing patterns of services and staffing (University of North Carolina, 1983).

To determine what relationships existed between the outcome measures and the dominance and population variables in targeted and non-targeted communities, analyses of variance tests for the two groups were applied to the outcome variables. The dominance and population variables were divided into four classes for dominance and three for population. Targeted programs were included in one set of ANOVAs and excluded from another. The means are summarized for self-sufficiency and productivity in Table 9. Again, no significant patterns of influence emerged from either group of analyses except for a clear, and expected, positive relationship between provider productivity and the population of the service area. This positive correlation held true when controlling for targeting and dominance and all possible interactions.

The use of market dominance in the analysis of program operations and outcomes indicates that direct competitive forces do not have a clear pattern of influence on the programs. There is a weak pattern of influence on dominance from the extent of isolation of the county in which the program is located as defined by the AMA's classification of counties (Pearson  $r = -.19$ ;  $p = .005$ ). If the program has National Health Service Corps funding ( $r = -.199$ ,  $p = .005$ ), the older the program ( $r$

= .165,  $p = .02$ ), and the percentage of non-whites in the service area population ( $r = -.147$ ,  $p = .04$ ), are also related to dominance, but the summative effect of these influences is unclear.

Thus, the direct impact of competition is difficult to measure because of a number of intervening variables such as: (1) the population of the service area; (2) the type of delivery organization; (3) the mix of services provided; and (4) whether or not the clinic is targeted to specific population groups. For, example, from earlier analysis of the data it was found that CHCs with targeted populations have very low self-sufficiency ratios regardless of the size of the community. Was this related to competitive factors in the environment? Table 9 shows self-sufficiency ratios by dominance class a proxy for competition. The n's in certain cells make statistical analysis of this distribution unstable; several generalizations based on validation of observations in case studies can be drawn. Dominance does improve financial viability in OGP's and non-targeted CHCs and PCCs, but mostly at the low end of the self-sufficiency scale. In targeted CHCs this was the result of increasing staff productivity. PCCs were not able to maintain high productivity in areas where they were very dominant for reasons which are unclear but probably related to their staffing patterns and their greater suitability for individual segments of the health care market. It is clear that greater dominance of the market, especially small markets, leads to improved productivity and self-sufficiency, but that appears to be a situation of diminishing returns as the capture of still higher market share calls for greater marketing efforts and for the capacity to meet a broader set of clinical and supportive needs.

The relationship between market dominance and program viability is suggested by Table 10 which summarizes the variable DOMINANC for four categories of programs and describes their status at follow-up. Nine programs closed during the year between surveys; the remaining programs are classified according to

their profit status. The closed programs faced greater competition than those remaining; the private, non-profit and for-profits also faced more competition than the community, non-profit programs and had higher measures of self-sufficiency and lower average costs as reported in Ricketts, et. al. (1984). This, again, presents a mixed pattern of relationships between market dominance and program outcomes.

### **Summary and Conclusions**

Subsidized and once-subsidized rural primary care programs do compete with other providers for clients and patients in a wide variety of ways including: (1) price, (2) service mix, (3) staff availability, (4) structural accessibility, (5) outreach, and (6) targeting a segment of the market. The particular way a program competes is affected by its proximity to other providers, the population it serves, the availability of resources, and the style and structure of practice a program's providers and administrators choose. This raises the immediate question of whether these competitive strategies are the result of response to conditions that arise in the environments of the programs or whether they are chosen proactively to cope with an early assessment of what a community needs and what will help the program succeed. Nevertheless, there appear to exist several patterns whether or not the competitive outlook is reactive or proactive:

1. Marketing decisions related to the scope of services and the extent of structural access to a program's services have an important impact upon that program's costs, productivity, survivability, and the size of any continuing subsidy.
2. Programs tend to assume one of a limited number of competitive postures that relate to their mission (comprehensive/targeted), their organization (structural access), their providers' preferences (hospital oriented), or a "scanning" practice style (screening and diagnosis).



3. Competitive environments for subsidized rural programs fall into two major classes, isolated or underserved. Neither type of environment dictates the type of competitive strategy a program will take although each contributes to the management and practice decisions with regard to service and structure.

4. The two variables that would seem, initially, to determine the competitive posture of a program—its market dominance and service area population—do not express themselves in program structure and operation with a predictable pattern. People living in rural areas travel great distances for medical care (Greene, 1979), and the borders of any service area are extremely permeable, especially in the case of new programs with providers unfamiliar to local residents or providers who are seen as transients. Thus, fixing a practice's population denominator or its direct competitors is very difficult and virtually impossible on a case-by-case basis. These characteristics of competition and competitive environments interact with the other management and practice decisions of rural primary care programs. Choice of a competitive strategy must rest heavily on the choice of whether to attempt to maximize income, minimize costs, or do both in order to minimize subsidies. (More cynical strategies of subsidy maximization are omitted.) The choice of a fundamental fiscal strategy pressures the choice of a competitive approach which, in turn, affects a program's clinical performance. Managers and practitioners alike must recognize this interactive environment if they are to agree on program objectives and seek to achieve them.

Table 1

**NUMBER OF PROVIDERS POTENTIALLY IN COMPETITION WITH THE  
PROGRAM**

1980 Survey	Providers Within a 30-Minute Drive		
	Mean	Standard Deviation	N
# Physicians	14.2	25.4	193
# Nurse Practitioners	3.3	16.0	189
# Physicians' Assistants	3.4	16.1	189

  

1981 Survey	The Service Area			Providers Within 30 Minute Drive		
	Mean	Standard Deviation	N	Mean	Standard Deviation	N
# Physicians	3.17	5.69	183	13.48	19.92	176
# New Health Practitioners (nurse practitioners or physicians' assistants)	0.37	0.99	183	1.67	4.79	169

Table 2

**PROGRAM PROVIDER DOMINANCE**

		Mean	Standard Deviation	N
1980	DOMINANC (30 minute)	.42	.33	193
1981	DOMINANC (30 minute)	.37	.32	166
1981	DOMINANC (Service Area)	.65	.30	177

Table 3

**COMPETITIVE STRATEGY VARIABLES**

Variable	Unit of Measure	Mean	Standard Deviation
<b><u>Independent</u></b>			
<b>Price</b>			
CHARGE	\$	13.65	3.10
PERSLIDE	%	22.00	30.00
COPOL2	Scale 1-3	2.16	0.54
COLRATE80	%	.076	0.22
<b>Structural Access</b>			
SITEHOUR	Scale 1-4	2.20	1.12
AHCVINDX	Scale 0-3	2.24	1.09
TRANSPOR	1-0	0.28	0.45
OUTREACH	1-0	0.31	0.47
ORGPROG	1-0	0.36	0.47
<b>Service Mix</b>			
PRICARE2	Scale 0-9	6.94	1.86
PRICARE4	Scale 0-9	4.46	2.43
HOSPCOV	%	56.30	44.00
LABINDX	Scale 0-7	4.95	1.57
PHARMACY	Scale 0-3	1.06	1.27
<b><u>Dependent</u></b>			
TCOST/MENC	\$/enc	36.01	18.84
TCOST/TENC	\$/enc	29.23	10.73
MCOST/MENC	\$/enc	17.07	7.15
REV/MENC	\$/enc	15.53	8.43

Table 4

**COST AND REVENUE EFFECTS OF INDIVIDUAL COMPETITIVE STRATEGIES  
(CORRELATION COEFFICIENTS)**

Competitive Strategy Indicators  (Independent Variables)	Cost and Revenue Measures (Dependent Variables)				
	TCOST/MENC	TCOST/TENC	MCOST/MENC	REV/MENC	REV/TENC
CHARGE	n.s.	n.s.	n.s.	n.s.	n.s.
PERSLIDE	+.320***	+.240***	n.s.	-.394***	-.462***
COLPOL2	n.s.	n.s.	n.s.	+.155**	n.s.
COLRAT80	-.240***	-.180**	n.s.	+.399***	+.452***
SITEHOUR	n.s.	n.s.	n.s.	n.s.	n.s.
AHCVINDX	n.s.	n.s.	-.14*	+.153**	+.147*
TRANSPOR	+.290***	+.250***	n.s.	-.247***	-.280***
OUTREACH	+.290***	+.190***	n.s.	n.s.	-.202***
ORGPROG	n.s.	n.s.	n.s.	n.s.	n.s.
PRICARE2	+.130*	n.s.	n.s.	n.s.	n.s.
PRICARE4	+.310***	.150**	n.s.	n.s.	n.s.
HOSPCOV	n.s.	-.160**	n.s.	n.s.	n.s.
LABINDX	+.210***	+.170**	.13*	+.216***	+.193**
PHARMACY	+.290***	+.330***	n.s.	n.s.	n.s.

TCOST = Total Costs  
MENC = Medical Encounters  
TENC = Total Encounters  
MCOST = Medical Cost  
REV = Revenue

\*p=&lt;.10

\*\*p=&lt;.05

\*\*\*p=&lt;.01

Table 5

**SUMMARY OF DIRECTION OF RELATIONSHIPS (SIGNIFICANCE) FROM  
REGRESSION ANALYSIS OF INDIVIDUAL COMPETITIVE STRATEGIES  
ON COST AND REVENUE MEASURES**

Competitive Strategy Indicators  (Independent Variables)	Cost and Revenue Measures (Dependent Variables)				
	TCOST/MENC	TCOST/TENC	MCOST/MENC	REV/MENC	REV/TENC
CHARGE	-	+	+	+(***)	+(***)
PERSLIDE	+	+	-	-(***)	-(***)
COLPOL2	+	+	+	+(**)	+(*)
COLRAT80	+	+	-	+(**)	+(**)
SITEHOUR	-	-	-	-	-
AHCVINDX	-	-	-(*)	+	+
TRANSPOR	+	+	+	-	-
OUTREACH	+	+	-	+(*)	+
ORGPORG	+	+	+	-	-
PRICARE2	-	-	-	+	+
PRICARE4	+(*)	-	-	+	+
HOSPCOV	-	-	-	-	-
LABINDX	+(*)	+	+	+	+
PHARMACY	+	+(***)	+	+	+
R <sup>2</sup> of model	.23	.19	.10	.29	.32

TCOST = Total Costs  
 MENC = Medical Encounters  
 TENC = Total Encounters  
 MCOST = Medical Cost  
 REV = Revenue

\*p<.10      \*\*p<.05      \*\*\*p<.01

Table 6

**FACTOR PATTERNS FOR COMPETITIVE STRATEGY/MARKETING  
INCLUDING COLLECTION VARIABLES**

<b>Competitive Strategy Indicators (w/Marketing)</b>	<b><u>Factor 1</u> Targeted/ Comprehen- sive Care</b>	<b><u>Factor 2</u> Structural Service Availability</b>	<b><u>Factor 3</u> Collection Emphasis</b>	<b><u>Factor 4</u> Hospital Orien- tation</b>	<b><u>Factor 5</u> Screening/ Diagnosis Emphasis</b>
PERSLIDE	.43453	-.05939	-.16346	-.03870	.11633
OUTREACH	.77455	.10292	.05702	.18665	-.11510
TRANSPOR	.70690	.12797	-.19629	.05351	.12915
COLRATE80	-.75648	.01360	.24635	.06357	.04298
SITEHOUR	-.09288	.59137	.17109	.02515	.06667
LABINDX	-.04693	.68743	-.22725	-.15568	-.07693
PRICARE4	.35273	.69884	-.10231	-.04836	.08146
PRICARE2	.20643	.52683	-.16833	.43370	-.06222
PHARMACY	.21403	.24890	-.61480	.04977	.14162
COLPOL2	-.17467	.08052	.83688	.03362	.02402
CHARGE	.18037	-.15019	-.23312	.42652	.02087
HOSPCOV	-.11376	-.01233	.19159	.83913	-.02337
AHCVINDX	-.3440	.32995	-.14049	.15567	-.68465
ORGPROG	-.18752	.32494	-.24469	.09687	.74810

Table 7

**FACTOR PATTERNS FOR COMPETITIVE STRATEGY/MARKETING  
WITHOUT COLLECTION VARIABLES**

Competitive Strategy Indicators (w/o Marketing)	<u>Factor 1</u> Targeted/ Comprehen- sive Care	<u>Factor 2</u> Structural Service Availability	<u>Factor 3</u> Hospital Orien- tation	<u>Factor 4</u> Screening/ Diagnosis Emphasis
PERSLIDE	.69989	-.43405	-.00217	-.04891
PRICARE4	.62485	.39075	-.12546	-.15826
PHARMACY	.56267	.13501	-.15831	.09182
TRANSPOR	.75031	-.24572	.03892	-.06860
OUTREACH	.67426	-.29446	.31774	-.13779
PRICARE2	.48857	.41974	.36726	.07188
AHCVINDX	-.17605	.55462	.43327	-.36202
SITEHOUR	.10118	.56908	-.02872	.11267
LABINDX	.31181	.60257	-.19624	-.15064
HOSPCOV	-.09843	.14406	.72505	.41582
CHARGE	.19216	-.18128	.17762	.54276
ORGPROG	.17352	.36133	-.44072	.57160



Table 8

**FACTOR ANALYSIS OF COMPETITIVE ENVIRONMENT  
VARIABLES**

Competitive Environment Indicators	<u>Factor 1</u> Isolation/Proximity	<u>Factor 2</u> Rural Under-Service
DOMINANC	.81786	.01376
REFSERV	-.73478	-.07800
HOSPMILE	.57146	-.15402
EXTSERV	-.47551	.64397
PHARMILE	.30816	-.62098
HLTHDEPT	.04841	.70728
EXTSERV	-.47551	.64397
PHARMILE	.30816	-.62098
ARFMDPOP	-.12258	-.49199

Table 9

**SELF-SUFFICIENCY AND PRODUCTIVITY FOR TARGETED AND  
NON-TARGETED PRACTICE BY DOMINANCE CLASS**

Dominance Class*	Self-Sufficiency Ratios (REVENUES/COSTS)					
	Targeted Practices			Non-Targeted Practices		
	CHC	OGP	PCC	CHC	OGP	PCC
<15%	0.23 n=4	0.28 n=1	0.31 n=8	0.37 n=5	0.63 n=9	0.32 n=15
15-60%	0.22 n=9	0.49 n=2	0.50 n=7	0.59 n=9	0.65 n=23	0.49 n=21
>60%	0.18 n=8	0.63 n=2	0.25 n=3	0.63 n=9	0.62 n=13	0.54 n=18
Dominance Class*	Staff Productivity (ENCS/FTES)					
	Targeted Practices			Non-Targeted Practices		
	CHC	OGP	PCC	CHC	OGP	PCC
>15%	780 n=4	557 n=1	831 n=7	725 n=5	1110 n=9	986 n=13
15-60%	782 n=9	657 n=2	960 n=6	1082 n=9	1280 n=21	944 n=19
>60%	674 n=8	1159 n=2	484 n=3	1184 n=7	1172 n=12	805 n=14

\*Proportion of service area providers working in the clinic.

Table 10

**MEAN VALUE OF DOMINANCE FOR PROGRAMS BY STATUS AT FOLLOW-UP#**

Status	Mean Dominance	N (=192)*
Closed	0.315	9
Private, for profit	0.357	23
Private, nonprofit	0.375	19
Community, nonprofit	0.451	141

\*Data missing from one program.

#Follow up survey done one year after Tier II survey

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