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Assessing Need for Primary Care  
in Underserved Areas

H. Paul LeBlanc III

Southern Illinois University at Carbondale

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### Abstract

Many studies have been conducted over the years which claim there exists considerable health care need in rural America. These studies cumulatively have resulted in policy changes and programs at the state and national level designed to alleviate the need. The fact that studies continue to find evidence of need might suggest that such policies and programs have done little to change the situation. Still, state and national agencies which fund programs require justification for expenditures in the form of needs assessments. Given these continuing requirements for needs assessment data, it would seem reasonable to assume that standardization of data collection and collaboration between agencies regarding data would converge. This paper discusses the problems inherent in assessing health care need. By drawing upon a recent experience of assessing primary obstetric care need in underserved areas in Illinois and Indiana, the author offers some suggestions and recommendations for assessing health care need in the future.

## Assessing Need for Primary Care in Underserved Areas

A considerable amount of research has been conducted on the problem of primary health care shortages in rural America. The need for primary health care in rural and inner-city areas has been widely demonstrated. While the supply of physicians and other health care providers is increasing, demand is still great in underserved and rural areas (Weiner, 1994; Williams, Whitcomb, & Harris, 1994).

Some indicators would suggest that things may be getting worse rather than better: The number of federally designated health professional shortage areas (HPSAs) has actually increased 40% since 1990 (Schroeder, & Beachler, 1995). As Schroeder (1996) commented, the problem is not undersupply of health care providers but maldistribution. To counteract these shortages, state and federal programs, such as financial incentive and loan programs for medical students, national and state health corps programs, and recruitment, training and placement programs for health care professionals, have helped but not eliminated the problem of primary health care shortages for portions of our population. Long-term efforts to increase the number of physicians serving rural and underserved populations had been relatively unsuccessful due to several factors including economic viability (see Schroeder and Beachler, 1995).

As part of a project to recruit, train and place nurse practitioners, certified nurse midwives, and physician assistants in medically underserved areas throughout Illinois and Indiana (see LeBlanc, deMeneses, et al., 1996), the author and colleagues demonstrated that there is inadequate access to obstetric care in some parts of Illinois and Indiana (LeBlanc, Simon, & Garard, 1996). To assess obstetric care need, LeBlanc,

Simon, and Garard (1996) utilized a population-based model. We compared the number of physicians to total population by county in Illinois and Indiana to determine need based on the American Medical Association's criteria. Similar techniques are used to determine federal and state health professional shortage area (HPSA) status. HPSA status is used for many programs designed to alleviate inadequate access to health care.

In a recent related study, Leitner, Gast, Sarvela, Ring, and Newell (1996) demonstrated that in Illinois, there is little or no correlation between need determined by epidemiological indicators and HPSA status. The Leitner, et al. (1996) study suggests that there are some methodological problems associated with claiming need based on physician to population ratios alone. Therefore, in our study we assessed need utilizing epidemiological indicators as well as physician to population ratios (LeBlanc, Simon, & Garard, 1996).

In this paper, I will discuss the methods used to assess primary care need as well as the methodological problems associated with those models of assessment. I will offer suggestions for assessing need and examine a new model based upon actuarial tables and population and provider projections. I will point toward the future of needs assessment and offer recommendations for collaboration on health care data collection. Finally, I will describe the activities of the Illinois / Indiana Nurse Practitioner, Certified Nurse-Midwife, and Physician Assistant Training Consortium as they relate to the efforts of data collection and future needs assessment goals.

## Models of Assessment

The most common or often used model of health care needs assessment is the ratio of health care providers to the population. There are many reasons for this. First, most population figures are readily available through the U.S. Census. These population figures are available for state, county, metropolitan, township, and census tract level every ten years. Furthermore, the Census Bureau makes yearly estimates at the state and county level, and these numbers are constantly revised.

Second, most other data necessary for a population based needs assessment are available from secondary sources. Numbers of physicians and physician locations are collected by the American Medical Association, the American Board of Medical Specialists, other medical associations, as well as by state licensing boards, state and local health departments. Epidemiological data is also collected by these organizations as well as by federal agencies such as the Centers for Disease Control and the U.S. Department of Health and Human Services. Consequently, population-based needs assessments are relatively easy to conduct due to the availability of secondary data.

Another model for assessing need is the client-demand model. Although data from market and other research may be available, typically this model requires collection of primary data. Data required for this kind of assessment may include consumer attitudes and behavior regarding the use of primary health care providers or access to health care. Some information may be available through patient records, however, that data is limited and only covers those members of the population who actually utilize health care services.

In our project, we assessed client demand for certified nurse-midwifery services. This was done by conducting potential-client focus groups. A convenience sample of women of childbearing age were asked, in focus group format, about their awareness of CNMs, their use of CNM services, and attitudes about the quality of CNM services. What was discovered was that women, for the most part, were unaware of certified nurse-midwifery. This focus group exercise provided valuable insight about access to health care: (a) it is highly dependent upon consumer knowledge, and (b) the focus group process itself serves as a form of marketing.

A third needs assessment model is the provider-demand model. In this model, assessment of need is based upon use of provider services. Need may be determined if there is great demand for services. To assess need, providers or provider groups may be surveyed about client use patterns, amount of business, and type of services offered and utilized. Providers may also be surveyed about their perceptions and attitudes about demand for provider services. These survey may assess attitudes of professionals toward other health care providers.

Finally, a provider-supply model is also utilized to assess need. In this model, two types of variables are examined: institutional output and employment patterns. The distribution of medical or nursing school graduates can show where provider supply is needed and where it is overabundant. Employment patterns, such as location or type of practice or practice hours of health care professionals are utilized to determine need. This model assumes that health care professionals are employable because of client demand or need.

Each of these models presents serious methodological limitations. The population-based demand model has two major flaws: (a) decentralization of data sources, and (b) validity issues. The decentralization of data sources is a logistical problem. Many different agencies collect different types of data for different purposes. The responsibilities of these agencies may or may not overlap which presents difficulties such as differing criteria for data collection, archiving, and transmittal. One of the most obvious results of this is the lag time for data collection.

In our study, we were able to locate all of the data variables necessary for our study. However, we discovered that one set of data was dated within a certain time frame, while another was dated within a different time frame. For example, vital statistics such as mortality rates may be available through 1995, but physician location was only available for 1992 and 1993. In our study we had to use only data from 1992 through 1993 because those were the only years in which all data for the study was available. The datedness of the data was a serious limitation of our study.

Even more problematical, however, are questions of validity. Our (LeBlanc, Simon, & Garard, 1996) results confirmed the results of the Leitner, et al. (1996) study which showed little or no correlation between epidemiological factors which demonstrate need and the HPSA designation which is based on physician to population ratios. Also, we discovered a considerable amount of migration for delivery services by women. Consumers might leave a need area in order to access health care. However, the connection between demonstrable need using the population-based demand model and client or provider demand or provider supply is not direct.

The client demand model also demonstrates serious limitations. As we discovered, public knowledge of health care options is lacking. With the current rate of changes in health care services, insurance coverage, and options in health care professionals, consumers are left with much confusion. Secondly, many consumers may not think about health care until an illness or injury occurs, and when it occurs seeks remedy without considering all the available options.

When collecting data for client demand model studies, the determination of potential clients is difficult. Random selection of all "potential" childbearing women may not represent all women willing and able to have children. Selection of "potential" clients for study introduces sampling errors. These sampling errors, if not accounted for, may jeopardize the validity of client-based studies.

The provider demand and supply models also have methodological limitations. Assessing need based on utilization often misses the un- or underinsured, Medicaid patients, or consumers who opt not to seek health care unless there is an emergency. In this sense, the provider demand model suffers from the same limitations as the client demand model. Limited resources in rural and underserved areas may require consumers to seek health care outside of their area which may over or underestimate need or provider maldistribution. As well, limited resources may prompt economically or professionally based turf battles. Providers may not be motivated to seek the best interest of all consumers, and may lack knowledge of the professional capabilities of other health care providers and thus not refer patients. Provider supply is not directly linked to consumer demand and thus is affected by "maldistribution" variables.

Future assessments should take these limitations into consideration. Perhaps the best means for countering the limitations is through methodological triangulation. Triangulation involves not only collecting data from different sources, but utilizing different measurement and analysis techniques. Researchers should utilize population, client, and provider demand models concurrently, then integrate the results of demand models with what is known about supply. By utilizing and integrating these models, researchers and policy makers can make accurate assessments and possibly forecast future needs.

Attempts to forecast future needs have been made by several researchers. One example of a health care forecasting model is the Integrated Requirements Model. The Integrated Requirements Model uses a triangulated estimation approach. The IRM also produces annual forecasts.

#### The Integrated Requirements Model

The IRM was developed by the Bureau of Health Professions of the Health Resources and Services Administration in 1995 (Moses & Sekscenski, 1996). The purpose of the IRM was to forecast workforce needs for primary care physicians, nurse practitioners, certified nurse midwives and physician assistants for the years 1995 through 2020. The forecasts are then useful in determining staffing needs by delivery modes.

The IRM uses a capitated approach to forecast needs for practitioners per 100,000 people. The methodology employed to produce forecasts include three steps (see Roerhig, Bedford, & Alexcih, 1995). The first step is to assign populations to specific delivery settings based upon population estimates and what the age, as well as

the location (urban or rural) and insurance status of the patient population. The model defines twenty possible health care delivery settings including HMOs, fee for service, Medicaid and no insurance.

The second step involves assigning practitioner staffing models to aggregates of the twenty health care settings in groups of practitioners per 100,000 people. The resultant data from the first step and second step is combined and calculated using six possible scenarios to derive an estimate of provider need. The six scenarios are: (a) status quo, (b) baseline insurance coverage, (c) high managed care, (d) universal coverage, (e) equal access under universal care, and (f) high NP, CNM, and PA utilization. It is assumed that the scale is progressive in that high NP, CNM, and PA utilization would be the most efficient thus lowering need for health care access.

The status quo scenario assumes little further change in modes of health care delivery and predictable demographic change. The baseline insurance scenario assumes downward trend changes in the uninsured population due to further penetration of managed care. The high managed care scenario provides estimates for high penetration of managed care and calculates impact on practitioner requirements. Under this scenario, the growth in managed care results in increases in practitioner needs, with the exception of CNMs, above the growth in the general population.

Under the scenario of universal coverage, all of the uninsured are distributed across the insured categories. However, even under universal coverage some barriers may still exist for equal access to health care for certain portions of the population. The IRM takes into account the possibility of equal access under universal care with its fifth scenario. Finally, high NP, CNM and PA utilization may reduce physician requirements

due to increased productivity. However, increases in productivity are affected by issues such as state regulations regarding advanced practice nursing and physician assistants and delegation.

Each of these scenarios are utilized to produce estimates of staffing needs for physicians, nurse practitioners, certified nurse-midwives and physician assistants. The IRM, therefore can be used to inform policy and program changes and modifications designed to meet the needs for primary health care.

One major limitation of the IRM is its use of macro-level estimates of practitioners' needs to provide an aggregate level of services. This approach does not take local or regional needs into account but rather treats all levels of the population as homogenous. In our study of obstetric care need in Illinois and Indiana, counties differed considerably by what characterized need. For example, most counties needed higher enrollment in first trimester prenatal care. Some counties experienced high infant mortality rates, high migration for delivery services or low physician to population ratios. These needs patterns were not necessarily directly correlated, although many counties scored high in need on three or four of these variables. For example, migration or low physician to population ratios may not be a predictor of enrollment in first trimester prenatal care. Enrollment may be more a matter of public education about the advantages of preventive care.

The IRM predicts little growth for the obstetric care profession. This is based on the number of obstetric care practitioners being produced as well as a changing national demographic. However, our study shows that despite the oversupply of providers there is still a considerable need for access to obstetric care services.

Although the IRM may adequately deal with the problem of over supply of practitioners, the IRM may not adequately deal with the problem of maldistribution. To resolve that problem other methods are needed.

### Recommendations for the Future of Needs Assessment

The Integrated Requirements Model provides a useful tool for macro level estimation and forecasting of need for primary care practitioners. However, it also provides helpful insight into the benefits of utilizing forecasting models. Programs that need justification for long-term funding can benefit from models that demonstrate need and forecast outcome. Also, models provide an opportunity for convergence of efforts as opposed to duplication.

In our experience the primary difficulty in assessing need is the lack of centralized data collection. With a model, several organizations can go about collecting data which can be integrated into a central database. One of the primary difficulties with assessment research is the seeming lack of agreement regarding the appropriate variables. A model can provide researchers at different institutions or agencies to collect and compare data. This convergence can lead to greater reliability with forecast and prediction models.

Another issue of importance to meeting health care need is evaluation of program outcomes. Under the current scenario, needs assessments may be continually done and redone sometimes requiring researchers to "reinvent the wheel." Proactive measures, based upon a model, may aid in the process of evaluation. For example, the tracking of recruitment, training and placement of practitioners can assist greatly the efforts of determining both the outcome of efforts and in assessing future need. By

tracking recruitment, training and placement, researchers and policy makers can assess whether programs designed to "home grow" practitioners can resolve the maldistribution problem. Furthermore, tracking both recruitment and placement can assist program designers in customizing programs for the particular needs of a region.

This tracking of provider supply throughout Illinois and Indiana, in particular, may assist us in meeting the obstetric care need in underserved regions by helping us to understand what drive practitioner maldistribution. In order to accomplish this goal, collaboration is needed between educational institutions, health care associations, provider groups, and government agencies. Through this collaboration, primary health care needs can be more effectively assessed and met.

Finally, modeling for need projections can reduce the time and energy spent on studying the problem of access to health care. Such a reduction will provide the added benefit of allowing more time to implement programs designed to meet those needs. In the final section I will describe how the Illinois / Indiana NP, CNM, and PA Training Consortium is planning to meet those needs through creative and proactive modeling.

### Conclusions

The purpose of the needs assessment that we have conducted was to justify program development and future expenditures. The overall goal of the project is to reduce and eventually eliminate medically underserved areas throughout Illinois and Indiana through the recruitment, training and placement of nurse practitioners, certified nurse-midwives, and physician assistants. We believe the elimination of underserved areas can be accomplished by "growing your own." However, the proof is in the doing.

Therefore we propose to utilize centralized data collection to track our recruitment, training and placement efforts.

To accomplish this objective, the Illinois / Indiana NP, CNM, and PA Training Consortium is developing a database which can be used by all partner institutions. The database will include information about students, preceptors and providers, location characteristics (including relative health care need and state and federal HPSA status) of all counties in both states, and the relationships between students, preceptors, providers and partner institutions. Through the collaborative sharing of resources and data collection, the consortium can assess current need, predict future need and evaluate program outcome.

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