A Geographic Framework for Coordination of Needs Assessment for Primary Medical Care in California

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DURING the 1970s, Federal, State, and local governments became increasingly aware of the need to improve the geographic distribution of primary medical care. Many States now have primary care service and educational programs with geographic objectives that are funded under various Federal and State legislative mandates. Eligibility for receipt of Federal and State funds for these programs usually depends on meeting certain qualifications of need or medical underservice as defined by specific criteria. When the criteria have been met, an agency of the Federal or State government can formally designate a geographic area as medically underserved or as an area of unmet need. Based on these designations, the geographic areas and their populations are either eligible or ineligible for publicly funded health programs in primary care. In this article, we use the term "underserved areas" generally for geographic areas that are formally designated as eligible for a publicly funded health program.

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The importance of the process of designating underserved areas has resulted in a number of studies devoted to this subject. (*1,2*) Most of the attention has been directed to the description of factors that define an underserved area. From these studies, policy makers have developed criteria to be used in designating underserved areas. Less attention has been directed toward the methods used in the delineation of geographic service areas where the assessments of need would be made. However, the manner in which the service areas are delineated has bearing on whether an area is formally designated as underserved. Federal and State government agencies are now using methods that were devised for delineating service areas.

When both Federal and State levels of government sponsor programs in a local area, it is useful to coordinate the various designation processes as well as the delineation of service areas. In California, a method for coordinating the assessment of need for primary care programs entails the use of a geographic framework as a fixed point of reference—the entire State is divided into primary medical service areas, and those areas that meet the criteria of need are formally designated as underserved. We describe the development and use of a geographic framework that helps coordinate the

designation of underserved areas among local, State, and Federal agencies.

California's Geographic Framework

In California, the Federal and State governments are formally designating geographic areas as medically underserved. The designation of these areas is guided by a geographic framework developed systematically for the entire State. This framework is a unique configuration of 249 geographic regions called medical service study areas (MSSAs). These regions were delineated originally for State primary education and medical service development programs (*3*). The MSSAs are the basic geographic units for continual assessment of need for publicly funded primary care programs.

The process used for designating underserved areas, devised by the California Health Manpower Policy Commission, consists of a number of steps. Briefly, these steps are as follows:

- delineating the geographic units that are the framework for analysis for the entire State—the MSSAs,
- determining the rural or urban nature of the MSSAs according to explicit definitions,
- for urban MSSAs having populations of more than 40,000, analyzing their socioeconomic and demographic characteristics and considering further geographic subdivisions,
- collecting and analyzing data on primary care physicians practicing in the geographic units,
- verifying the data and findings with local officials,
- adjusting the boundaries of the geographic unit, where appropriate, to reflect the advice of local officials.
- designating specific geographic units as underserved according to established criteria of need,
- monitoring the changes in the distribution of primary care physicians in the geographic units that result from government program interventions or other causes, and
- changing the status of a geographic unit as designated or not designated to reflect changing conditions.

Decisions to designate or not designate a geographic unit as an underserved area are made at regular public meetings of the commission.

Coordination of Needs Assessment

The State Legislature and the Governor placed the responsibility for designating underserved areas with the California Health Manpower Policy Commission. The commission, which administers a primary care health manpower development program (the Song-Brown Family Physician Training Act), is associated with the Office of Statewide Health Planning and Development, the State's principal health planning agency (*4*). Several other organizations in the State

are engaged in activities affecting health manpower planning development to some extent. The commission's approach to designating geographic areas has enabled coordination of these activities (fig. 1).

The general coordinating role of the California Health Manpower Policy Commission in the designation of underserved areas is represented in figure 2. As shown, multiple agencies and programs in State government use the commission's designations of underserved areas for assistance in setting programmatic priorities. State uses of the designation are as follows: The Board of Medical Quality Assurance administers a program of loans for medical students and loans for physicians to establish practices in certain underserved areas. The State Certificate of Need Program offers exemptions to certain health facilities in underserved areas. Various divisions of the Department of Health Services provide funding for clinics in underserved areas. An Allied Health Opportunity Program places allied health professionals in underserved areas. A health facilities development program provides funding for the renovation of clinics. In the family practice physician, nurse practitioner, and physician assistant training programs, primary care personnel are selected and trained for underserved areas. Several health systems agencies and the local health departments in California use the designations for regional planning activities. Additionally, directors of the federally funded California Statewide Area Health Education Center and the various local area health education centers acknowledge the usefulness of the MSSAs in their needs assessment activities.

The commission's division of California into geographic units is also used as the basis for comments on proposed designation of Federal health manpower need areas by California's State health planning agency and the Governor's office. The interfacing of the State and Federal processes of designation has resulted in both governments designating areas with the same geographic boundaries. The formal State designation process, referred to earlier, includes consultation with the local providers and consumers and use of a set of boundary delineation procedures applied systematically throughout the State. The process is dynamic. A person who does not agree with the boundary lines delineated may petition the commission to change the lines. However, changes in boundaries affect all State programs that use the geographic framework; therefore, the commission consults all users before a change is made.

Figure 1. Organizations engaged in statewide primary care manpower needs assessment in California

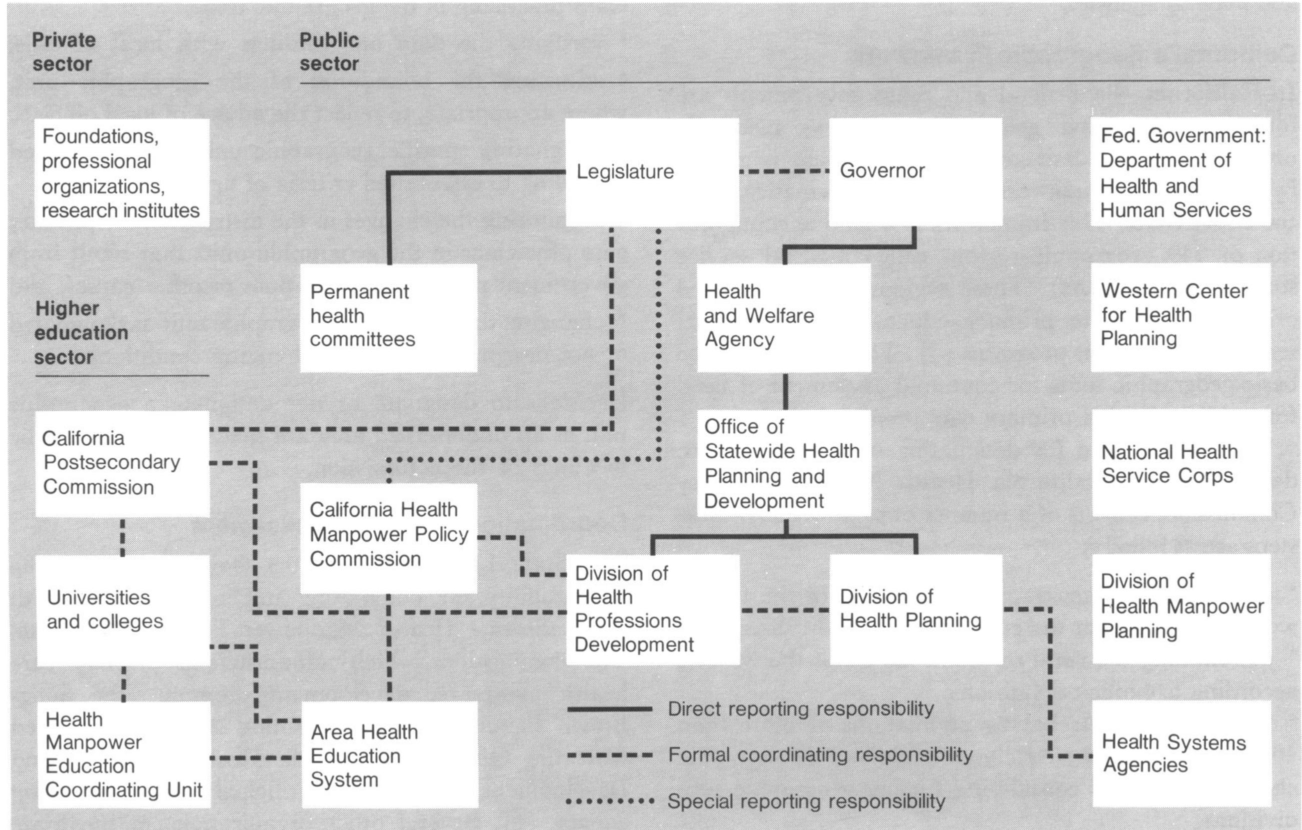
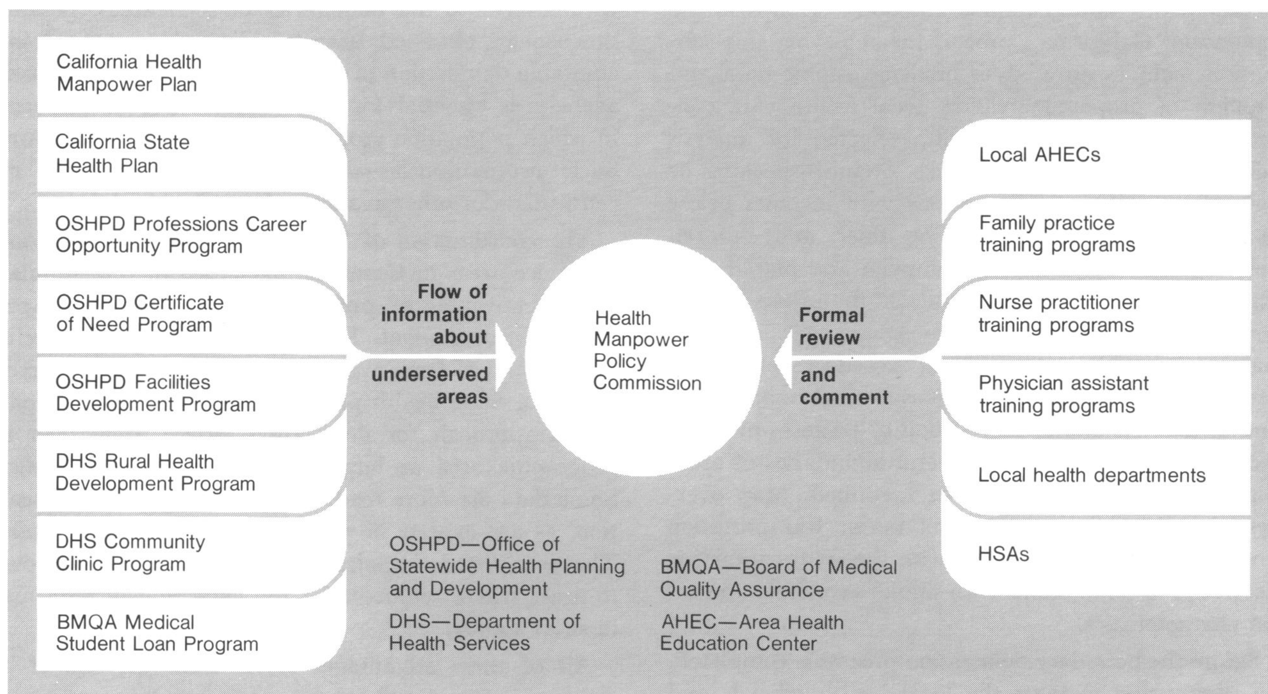


Figure 2. Flow of information about underserved areas designated by the California Health Manpower Commission



Development of Designation Process

The Health Manpower Policy Commission began its statewide approach toward the delineation of medical service study areas in 1976. The entire State of California was first divided into MSSAs. The geographic unit used in the construction of these service areas is the census county division. Censsu county divisions are defined by the U.S. Census Bureau as "one or more census tracts reflecting mainly trade or service areas of principal settlements and in some cases, major land use or physiographic differences" (*5*). In a previous study, performed on a regional level in California, the census county division was used as a medical service area (*6*).

The principal advantage of using census county divisions as the unit of analysis is the availability of demographic data collected by the U.S. Census Bureau. However, census county divisions vary markedly in size and density of population throughout California. Generally, census county divisions in sparsely inhabited areas extend over more territory than those in or near metropolitan areas. In the establishment of MSSAs, the distances were examined between the principal population centers of the census county divisions and the outlying communities. The calculation of distances in a consistent and comprehensive manner required an equivalent measurement of mileage for desert, mountain, and valley areas. In California, such a measurement existed in the form of "constructive miles," which represent distance equivalents in miles based on topographical, climatic, and traffic conditions. The concept of constructive miles and the mileage tables were created by the California Public Utilities Commission (*7*). A complete explanation of the methodology used to derive the mileage tables and to apply constructive mileage was published by Mohr in 1964 (*8*).

In the formation of MSSAs, census county divisions were aggregated or left separate so that outlying communities within a standardized distance would be grouped around a principal population center. The distance criterion selected and applied on a statewide basis was 20 constructive miles. An initial delineation of MSSAs was sent to local officials for review and comment. Several adjustments were made, and currently a total of 249 MSSAs are delineated. Each has been determined to be either rural or urban, based on the population density of the area and the number of people residing in the area's principal population center. An MSSA is defined as rural if it has a population density of fewer than 250 people per square mile and contains no incorporated community with a population of more than 20,000.

For urban MSSAs, the size and characteristics of the population vary widely. The formation of geographic units in urban areas required further subdivision of some of the MSSAs to arrive at "neighborhood areas,"

which reflect residential trade patterns, topographical characteristics, and economic and social groups in the population. California's process for achieving this subdivision includes an analysis of demographic data and a review of proposed areas by local health care consumers and providers. The data selected for analysis include the percentage of blacks, Spanish-speaking or Spanish-surname persons, persons with incomes below the poverty level, persons 65 or older, and children under age 5. These data are compiled and placed on a single record for each census tract in the urban MSSA. Percentage thresholds are chosen for each of these characteristics. Census tracts that exceed predetermined thresholds are noted on the census tract maps. This kind of analysis allows observation of patterns of social and economic groups. The general boundaries of areas containing these groups can be identified. Map overlays of political boundaries and major transportation arteries can then be compared with the areas containing the groups of populations with similar economic and social characteristics.

Before the boundary-delineation process is completed, the commission requests the local health officials and health systems agency to review the resulting geographic areas. The objective is to secure a consensus with local health care consumers and providers as to what the boundaries should be.

Public Policy Implications

The approach used for determining primary medical care service areas in California offers some distinct advantages for the formulation and coordination of public policy. The approach provides a comprehensive view of the distribution of primary care resources in a region. Instead of focusing on isolated subregional areas, the approach adopted in California allows for an assessment of the distribution of primary care physicians within a larger geographic framework.

This approach also enables the development of a consensus among local health care consumers and providers on the boundaries of service areas before areas are determined to be underserved. This sequence of steps avoids the inequity that results when one party or group petitions to have an area designated before another party can do so. Also, an area potentially eligible for designation may not be designated because no one has requested it.

The early involvement of local representative agencies in the process of delineating geographic areas without initially identifying underserved areas can greatly assist future planning by avoiding time-consuming negotiations between groups that wish to obtain designation of a particular area as underserved but disagree with respect to the boundaries of such areas. Besides the benefits obtained from avoiding the potential inequitable designation of areas, the involvement of local agencies is essential for an understanding of patterns in which population groups seek primary medical care. Such information usually is not readily available in census data or other available demographic data.

The coordination of State and Federal designations of service areas increases the likelihood of the cumulative effectiveness of programs administered by these levels of government. Further, the provision of technical guidance from a centralized yet accessible source, such as a State health planning agency, permits a consistent approach for delineating service areas over a geographic area as large as the State of California. Some data are more readily available in a central location, as are experts in organizing and analyzing data. The centralized organization of data is advantageous to areas where resources for the collection of data are in short supply.

All of these advantages result from the use of a geographic framework for designating underserved areas such as the one adopted in California. This framework was formed in response to public policy legislation concerning primary medical care. In turn, continual refinements of the geographic framework and the designation process in California serve the ongoing process of public policy formulation in the State.

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