Primary care providers and practice locations

Examining the relationships

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ABSTRACT

Background. The authors conducted a study in which they explored the geographical distributions of primary care dentists, physicians and pharmacists to determine if a spatial pattern existed between provider types across cities in Iowa.
Methods. The authors analyzed practice locations of primary care providers, including dentists, pharmacists and physicians, at the city and county levels in Iowa for 2000 and 2010. They categorized cities on the basis of types of primary care providers in each city and compared population characteristics.
Results. Among cities with primary care providers of any type, the most common scenario was for all three provider types to be found together. Several cities that had at least one physician and pharmacist but no dentist in 2000 gained one by 2010.
Conclusions. There appears to be a heterarchy of primary care providers in Iowa cities, with pharmacists more prevalent than physicians and dentists.
Clinical Implications. Communities with at least one physician and pharmacist but no dentist may be able to offer new or relocating dentists a competitive opportunity for practice.
Key Words. Primary health care; access to care; physicians; dentists; pharmacists.
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Researchers and policymakers in the United States have recognized for decades that a geographical maldistribution of primary care providers exists that disproportionately affects residents of rural and inner-city areas.[1] The persistent disparities between the urban and rural distribution of health care providers calls for innovative research, the results of which support programs designed to alleviate access barriers. We initiated this project to examine the distribution of primary care dentists, pharmacists and physicians in Iowa. We analyzed practice locations to determine if a spatial pattern or heterarchy exists. For communities looking to recruit and retain health care providers, a keystone provider may be required before they can attract different types of providers.

In addition to personal motivators such as family and local ties to communities, professional relationships can be powerful motivators for practice location. Physicians place a high priority on proximity to hospitals, and study findings have shown that professional interactions are important for job satisfaction.[2-4] It is reasonable to assume that similar factors motivate dentists and other health care providers. Although urban prac-

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titioners may have ample opportunities for professional interaction with other health care providers, peers can be relatively scarce in rural areas. Consequently, in small communities, interactions between different types of health care providers may become more important.

Geographers developed central place theory in the 1930s to explain the distribution of retail goods and service industries across the landscape.[5] According to the principles of this theory, goods and services appear in market areas on the basis of minimum populations required to support them. This location theory also predicts that basic services will be found more commonly and more specialized services will be found less frequently.[5] Researchers have applied the hypothesis that goods and services are found in hierarchical patterns in communities to health services research, including evaluations of the physician workforce and provision of hospital services.[6,7]

Lawlor and Reid[6] found that primary care providers were the most common medical provider in U.S. counties. They also identified a pattern of increasingly specialized physicians' (for example, dermatologists' and allergists') being located in larger counties in which there was a full range of basic medical providers (for example, general practitioners, internists and general surgeons). In a study of hospital specialization, Berry[7] identified services that appeared to be basic and ones that were more complex, which were added by hospitals in a predictable order as the facilities increased in size and number of beds. We hypothesize that a similar ordering of services may occur among primary care providers in Iowa.

Research findings have demonstrated that the supply of physicians in a county is correlated positively with the supply of dentists.[8] Knapp and Hardwick[9] found that primary care physicians and dentists were the most common pairing of primary care providers at the zip code level in the United States. The results of our previous investigations suggest that a county-level relationship also may apply to dentists and pharmacists (unpublished data, 2007). This coincident geographical relationship is intuitive: communities require primary care providers to meet local demand for health services. We designed the current study to examine whether a heterarchical relationship existed among dentists, physicians and pharmacists in Iowa. If primary care providers are found to colocate in communities in a predictable pattern, recruitment efforts can target communities with favorable conditions. Although individual providers may be motivated by different factors in selecting practice locations, central place theory offers a conceptual framework that facilitates a community-level analysis of the relationships between multiple provider types.

The objectives of this study were to map the distribution of primary care dentists, physicians and pharmacists in Iowa in the year 2000; evaluate the spatial relationships between the practice locations of these providers; and examine changes in these relationships after a 10-year period. We hypothesized that pharmacists or physicians were keystone providers and that dentists would be found more often in cities and towns with these other health care providers than in communities without them.

METHODS

Study population. We designed this study to evaluate the distribution of primary care providers in Iowa so that we could identify potential heterarchical relationships with respect to their spatial distribution. Primary care providers of interest included dentists, physicians and pharmacists. For this study, we defined primary care dentists as general or pediatric dentists in private practice. Primary care physicians included those engaged in private practice of the following specialties, as designated by The Iowa Health Fact Book: family practice, internal medicine, pediatrics and obstetrics/gynecology.[10] We excluded dentists and physicians practicing in community health centers (CHCs). CHC providers often are supported by state and federal incentive programs to serve in shortage areas, and their presence in a community may not be supported adequately by local demand alone. We defined community pharmacists as independent practitioners and practitioners employed by chains, including practitioners sponsored by hospitals. We excluded hospital-based pharmacists and those in academic settings. We obtained main practice addresses for primary care providers engaged in active practice in Iowa during 2000 and 2010.

Source of data. We obtained information about health care providers from the Iowa Health Professions Tracking Systems.[11] Although participation in the tracking systems is voluntary, this data set captures information pertaining to almost 100 percent of Iowa's practitioners.[12] We analyzed practice locations at the city level by using shapefiles delineating the boundaries of incorporated areas in Iowa. Incor-

ABBREVIATION KEY. CHCs: Community health centers. **RUCCs:** Rural-Urban Continuum Codes.