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Exploring the Association between Long-Term HPSA Designation and County Population-to-Physician Ratio

Abstract

Federal, state, local and public health officials utilize Health Professional Shortage Area (HPSA) designations to manage health and physician workforce development in underserved regions. HPSA designation length by county was examined to determine if there is significant association with population-to-primary care physician ratio since the inception of HPSA designations in 1978. Counties were grouped in 5 categories based on consecutive designation length and analyzed with demographic variables. This report examines the relationship of long-term HPSA status and changes in primary care physician workforce.

Keywords

HPSA, Physician Workforce

Research has consistently shown an association between primary care physician supply and improved population health outcomes.¹ An area's population-to-primary care physician ratio also acts as an influential indicator for local and state public health officials because it is the key component for designating a primary care Health Professional Shortage Area (HPSA)² and key indicator for an area's general health. Federal, state, local and public health officials utilize HPSA designations to manage health workforce development and to determine eligibility for a variety of federal resources, programs, and grants, such as Community Health Centers, National Health Service Corps, Title VII and Title VIII health professions training grants.¹ This analysis will help public health officials determine if HPSA designation has been associated with positive long-term changes in primary care workforce.

HPSA designations were developed in 1978 under Section 332 of the Public Health Service Act by the Department of Health and Human Services (DHHS) to allocate resources and offer benefits for areas and/or populations that are in the greatest need of medical assistance.¹ DHHS reviews four specific determinants to ascertain whether a service area is eligible for a primary care (PC) HPSA designation, including infant mortality, population-to-primary care physician ratio, percent of population with incomes under federal poverty level, and travel distance to closest accessible source of care.¹

The enactment of the Affordable Care Act could potentially provide health insurance access to 18.8% more of North Carolina's population;³ creating a higher physician demand than historically seen. With increased demands for primary care services, population-to-physicians ratios and HPSA designations will come under additional scrutiny. The purpose of this research is to identify if the length of a county's HPSA status (persistent, intermittent, or none) has a significant association with their population-to-primary care physician ratio since the inception of the HPSA designation.

METHODS

The number of active primary care physicians and population size of each North Carolina County for the years 1980, 1990, 2000, and 2010 was collected from the UNC Cecil G. Sheps Center to calculate population-to-physician ratios for primary care providers. HPSA designations of all 100 North Carolina counties for the years 1980, 1990, 2000, and 2010 were retrieved from the federal register. Per capita income for each county was retrieved from the 2010 U.S. Census Bureau.

To assess whether HPSA designation was having a significant impact on the primary care physician workforce, statistical differences in population-to-primary care physician ratios from 1980 to 2010 were examined.

Counties were divided into 5 groups: (0) County never designated as a HPSA; (1) HPSA county for less than 10 years and with no consecutive designations; (2) HPSA county for 10 to 19 consecutive years at minimum; (3) HPSA county for 20 to 29 consecutive years at minimum; (4) HPSA county for 30 consecutive years or more. Changes in the longitudinal population-to-physician ratio as well as population size for each group were calculated as the percent difference from 1980 to 2010. Only whole county HPSAs were examined in this analysis.

Descriptive statistics, ANOVA, and Tukey HSD Post-Hoc tests were performed using SPSS V.20.0 (Armonk, NY: IBM Corp) on the length of HPSA designations and percent difference in population-to-physician ratio from 1980 to 2010, as well as a separate analysis on percent difference in population and per capita income from 1980 to 2010 by length of designation groups.

RESULTS

Eight of the twelve current NC whole county HPSAs have retained their same designation status for more than 30 years.

The analysis indicated that there are not significant differences ($p = 0.092$) between length of HPSA designation and the percent change in a county's population-to-primary care physician ratio from 1980 to 2010. Counties with long-term HPSA status did not see any additional improvements in physician supply than counties where federal initiatives were not focused. Counties that were designated as whole county HPSAs for at least 20 to 29 consecutive years (3) saw the greatest improvement in their population-to-primary care physician ratio (+70.78%), whereas counties with the longest consecutive designation from 1980 to 2010 (4) saw a decline (-1.66%); although no statistical differences were detected between these two groups ($p=0.069$).

While no statistical distinction was established for percent difference in population growth ($p = 0.592$) and per capita income ($p = 0.141$), the analysis revealed that disparities between designation groups still exist for demographic variables such as actual population-to-primary care physician ratios in 1980 ($p < .0005$) and 2010 ($p < .0005$) along with population ($p = 0.021$) and per capita income ($p = .011$) in 2010. This implies that while these counties are developing at a similar longitudinal pace, their demographic characteristics vary.

Designation Groups		N	Mean Population in 2010	Mean % Difference in Population Growth from 1980 to 2010	Mean Per Capita Income in 2010	Mean % Difference in Per Capita Income	Mean Population to PC Physician Ratio 1980	Mean Population to PC Physician Ratio 2010	Mean % Difference in Ratio from 1980 to 2010
Temporary	Never PC HPSA (0)	50	142,415	+54.33	\$32,753	+125.73	1:1883	1:1316	+52.25
	>10 year PC HPSA (1)	23	54,851	+46.32	\$29,889	+129.47	1:2941	1:2516	+52.61
Long-term/Persistent	10 to 19 year consecutive PC HPSA (2)	10	46,104	+28.43	\$31,298	+132.22	1:2823	1:2560	+43.06
	20 to 29 year consecutive PC HPSA (3)	9	63,187	+51.08	\$28,327	+126.01	1:4198	1:2622	+70.78
	30≤ year consecutive PC HPSA (4)	8	20,049	+43.43	\$28,617	+128.70	1:3831	1:4706	-1.66
	<i>p-value</i>		.021	.592	.011	.141	.000	.000	.098
Total		100	95,724	+48.73	\$31,220	+127.50	1:2585	1:2105	+48.77

IMPLICATIONS

Counties that had long-term, whole county HPSA status had no additional statistical improvement over those designated for shorter periods or never designated; however, counties designated for 30 consecutive years saw a troubling decline in their population-to-physician ratio.

Several long-term HPSA areas originally having severely low ratios (group 3) saw more growth in physician supply than counties with moderately low ratios and shorter designations (groups 1&2). Only those designated for 20-29 years (group 3) saw a considerably higher rate of physician growth at 70.78% than non-designated counties (group 0) at 52.25%. Possible explanations for limited growth in other long-term HPSA counties could be a reluctance to recruit enough primary care physicians to end their HPSA designation because of the allocated benefits they could lose. Certain rural areas may be also unable to recruit physicians and therefore rely on physician extenders to fill their healthcare needs.

Improvement in physician workforce was more closely associated with demographic variables than HPSA designation length. Long-term growth amongst designation groups was not significantly different, yet significant differences in population size and per capita income were noted. Not surprisingly, counties with no HPSA designations had larger populations and per capita incomes. Although all HPSA designated counties shared similar income levels, those with the longest designations were significantly smaller in population. The compelling lack of improvement for counties with the worst ratios and lowest populations (group 4) also insinuates a widening gap in disparities between rural and urban areas. The data doesn't necessarily reflect the rich getting richer from a financial standpoint, but most likely those with health infrastructure being able to successfully recruit additional health workforce, while those with little or no infrastructure struggle to improve.

Studies have linked significantly better health outcomes in states that have a higher primary care physician ratio to their population.² It is important to note that while most counties did see an improvement in their population-to-physician ratio, most groups fell short of the most updated ratio recommendation, 1 physician per 1,803 individuals.⁴ Public health officials should utilize these findings to determine more effective measures for assisting long-term HPSA counties with inadequate primary care workforce.

SUMMARY BOX

What is Already Known about This Topic? HPSA designations are intended to increase primary care physician workforce because it is associated with improved health outcomes.

What is Added by this Report? This report looks at how the length of a county's HPSA designation is associated with changes in population-to-primary care physician ratios as well as demographic characteristics, such as per capita income and population growth from 1980 to 2010.

What are the Implications for Public Health Practice, Policy, and Research?

Improvement in physician workforce may have a stronger association with available health infrastructure. Public health officials and politicians should employ additional efforts for assisting long-term HPSA counties that lack a healthcare infrastructure.

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