Supply of Primary Care Physicians Across Health Professional Shortage & Non-Shortage Areas in the United States

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Introduction: Maldistribution of the health workforce and of health care resources contributes to health outcome disparities (Blumenthal, 2004; Frino, 2001; Rosenblatt, 1991). This study compares the geographic distribution of primary care physicians in Health Professional Shortage Areas (HPSAs) to that in non-HPSA areas. The aim is to identify areas of real shortages and surplus of primary care physicians and examine if the current HPSA designation has optimized the resource allocation to help people in real need.

Data & Method: Primary care physicians[1] "practice locations" are geocoded from the 2007 American Medical Association (AMA) Master File (September 2007). Their locations are then overlaid to primary care HPSA areas (HRSA Data Warehouse, March 14, 2008). Although AMA Master File does have some inconsistencies (Freed et al 2006), it is still the widely used data for health workforce analysis. Only HPSA with current status listed as "Designated" or "Proposed Withdrawal" are selected as "current" HPSA for this analysis. Population estimates are based on the 2007 county-level population estimates from US Census Bureau. Specifically, the 2007 county level estimates are linked to the census 2000 blocks. Then the estimated block population within each HPSA is summarized as the estimated 2007 HPSA population. To eliminate a HPSA at a 1500:1population to physician ratio, for instance, one would need to divide a HPSA population by 1500 to get the number of primary care physicians needed to reach that population to physician ratio. There would be primary care physician shortages if this number is more than the current number of primary care physicians in that HPSA unit; there would be primary care physician surpluses if this number is less than the current workforce of primary care physicians. The total of the shortages for all HPSA units is the number of physicians that are needed to eliminate all HPSAs at 1500:1 ratio. Likewise, one can estimates the number of primary care physicians needed to eliminate HPSA at other ratios.

Result: Our analysis indicates a severe mal-distribution of primary care physician workforce in HPSA areas: the primary care physician to population ratio suggests within the current HPSA areas there are 933 HPSAs that have physician shortages at 3000:1and 1956 at 1500:1 ratios respectively, indicating non-optimal allocation of resources according to current HPSA designations. Even in the non-HPSA areas we still can identify areas of primary care physician shortages: 156 counties (and/or partial counties) with 2.2 million residents are in need of 242 primary care physicians at 3000:1 ratio. This worsens to 276 counties (or partial counties) with 7.7 million residents that are in need of 948 primary care physicians at 2000:1 ratio. This further increases to 540 counties (and/or partial counties) with 29.9 million residents that are in need of 3,916 primary care physicians at 1500:1 ratio.

Conclusion: The findings suggest that the current HPSA designation system is in lack of optimization for resource allocation and this demands a more equitable method for primary care HPSA designations.

Notes: [1] Physicians whose primary specialty is 'ADL', 'AFP', 'AGP', 'FEM', 'FOM', 'FM', 'FP', 'FPO', 'FPG', 'FSM', 'GER', 'GFP', 'GGP', 'GIM', 'GP', 'GYN', 'IEM', 'IM', 'IMG' 'MPD', 'OBG', 'OBS', 'OGS', 'PD', or 'UFP' are counted as primary care physicians.

References: Blumenthal, David (2004). New stream from an old cauldron—the physician-supply debate. *New England Journal of Medicine*, 350(17): 1780-1787.
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Software Used: SAS 9.2; ArcGIS Desktop 9.2.