

## Shortage or Mal-distribution: An Analysis of the Spatial Accessibility of Primary Care Physicians in Nebraska

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## Purpose of the Study

- 1) To assess the size, composition and geographical distribution of the primary care provider workforce in the state of Nebraska;
- 2) To use spatial analysis to assess the supply of primary care providers in terms of spatial accessibility (availability and accessibility) of providers and
- 3) To identify areas of shortage of primary care providers in the state.

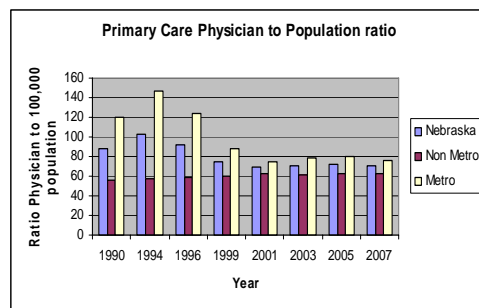
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## Background

- Availability refers to the number of service providers from which a patient or client of health care services can choose.
- Accessibility refers to the travel distance or time between the location of the client and health service provider.
- Spatial Accessibility should be taken in to account when defining health profession shortage areas (Luo and Wang, 2003; Guagliardo, 2004).
- This method accounts for the phenomenon of patients crossing bordered areas to obtain care.

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Primary Care Physician to Population ratio



Source: Nebraska State Office of Rural Health

## Data Sources and Study Design

- The study design is a cross-sectional observational study design.
- Data on the supply of primary care providers in 2007 are obtained from the Health Professions Tracking Center at University of Nebraska Medical Center and the Nebraska State Office of Rural Health.
- Population estimates are obtained from the U.S. Census Bureau's most recent data release.

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## Methods

- Data on the current supply, age and gender distribution of primary care providers in 2007 are obtained from the UNMC Health Professions Tracking Center
- Spatial Accessibility assessed using the 2 Step Floating Catchment Area (Luo & Wang, 2003)
- Step 1: Provider to population ratio for each provider location
- Step 2: Spatial Accessibility (SA) value obtained for each population point by summing the provider to population ratios of all the provider catchments that overlie the population point.
- Takes into account both availability and accessibility

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## Sample Description

- Sample 1 - Primary care physicians including Allopathic MDs, DOs, residents, physician assistants and nurse practitioners employed in primary care
- Geocoded for primary practice location
- Spatial Accessibility values computed
- FTEs calculation :Full-time: 1 FTE; part-time 0.5 FTE; MD/DO = 1 FTE; NP/PA = 0.5 FTE; Residents = 0.5 FTE

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## Sample Description

- Sample 2- MDs and DOs
- Geocoded for primary and satellite practice locations
- Spatial Accessibility values computed
- Shortage areas identified by 2 step Floating Catchment Area method
- Compared to federal HPSA designated shortage areas

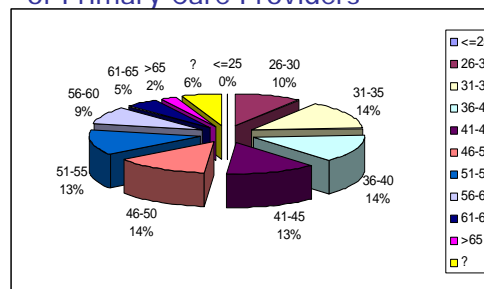
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## Number of Primary Care Providers by Profession

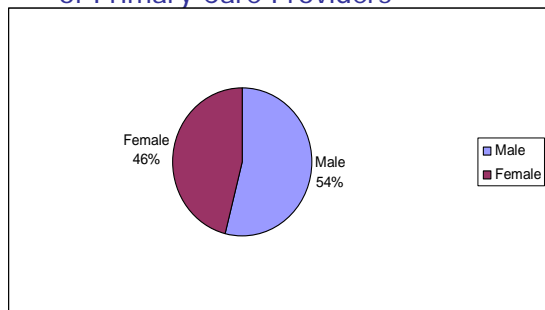
	Count	Percentage
DO	60	3%
MD	1,245	61%
Resident	237	12%
Nurse Practitioner	229	11%
Physician Assistant	286	14%
Total	2,057	100%

Source: Health Professions Tracking Center, 2007

## Age Distribution of Primary Care Providers



## Gender Distribution of Primary Care Providers



## Medical School Location

	Nebraska	Other US State	Foreign	Unknown	Total
DO	0 (0%)	59 (98%)	0 (0%)	1 (2%)	60
MD	890 (71%)	236 (19%)	110 (9%)	9 (1%)	1245
Nurse Practitioner	170 (74%)	56 (24%)	0 (0%)	3 (1%)	229
Physician Assistant	222 (78%)	64 (22%)	0 (0%)	0 (0%)	286
Resident	105 (44%)	96 (41%)	36 (15%)	0 (0%)	237
Total	1387 (67%)	511 (25%)	146 (7%)	13 (1%)	2057

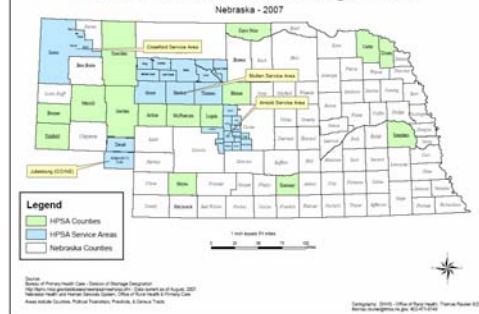
Source: Health Professions Tracking Center, 2007

## Number of Primary Care Physicians by Specialty

	Count	Percentage
Family Medicine	1,062	61%
General Practice	16	1%
Internal Medicine	234	13%
Internal Medicine/Pediatrics	10	1%
Obstetrics & Gynecology	223	13%
Pediatrics	208	12%
Total	1,753	100%

Source: Department of Health & Human Services, Office of Rural Health & Primary Care

## Federally Designated Primary Care Health Professional Shortage Areas



## Significant Contribution

- Includes Physician assistants and nurse practitioners
- Includes information on multiple practice sites of primary care physicians.
- Addresses the limitations of the AMA database. A significant number of records in the AMA Master file have only PO Box addresses; about 20% of the addresses may not be the office address. The HPTC physician data addresses both of these limitations.
- Information available on percentage of time spent at each practice location - FTE physician at each practice location

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## Policy Relevance

- Recent advances in GIS methods and the availability of data at finer geospatial resolution have resulted in significant advances in workforce shortage research methods.
- Improved data and refinements in the methodology can better inform policy makers in the health workforce planning process.
- GIS is a powerful tool and should be more widely used in planning efforts.

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