

The Effect of Local Primary Care Physician Supply on Physician Access and Utilization of Preventive Services

Tracey Continelli, ABD and
Sandra McGinnis, Ph.D.

New York Center for Health Workforce Studies, University at Albany, State University of New York

Purpose of this Research:

- To integrate geographic and non-geographic factors that predict utilization of preventive health services into one model at both the individual and local level; and
- To examine the relationships between local primary care physician supply, the probability of having a primary care physician, and the likelihood of obtaining various preventive health services.

Data and Methods:

- Adirondack Rural Health Network conducted a community health assessment survey for 6 counties in upstate New York in 2004 and 2007: Fulton, Hamilton, Essex, Warren, Washington, and Saratoga.
- Survey asked respondent's residential zip code, whether or not the respondent had a primary care physician, and if yes, in what place (city or town) was the physician's office located.
- Total of 2043 cases used in analyses.
- City or town of physician's office was matched to its respective zip code, and residential zip codes were matched with their respective RUCA codes.
- Average Euclidean distance between the geographical centroid of residential zip code and primary care physician zip code was computed.
- Average distance in Euclidean miles from residences to primary care physicians based on aggregated RUCA codes were computed. [Urban = 7.3 miles, Large Town = 8.8 miles, Small Town = 11.2 miles, Rural = 13.1 miles]
- Local physician supply was based on the total number of all active primary care physicians across all zip codes that fell within a respondent's residential radius, divided by the total population across all zip codes within a respondent's residential radius, multiplied by 10,000.
- Outcome variables: the probability of having a primary care physician, followed by the probability of getting:
 - Blood pressure checked
 - Checked for diabetes
 - Blood stool test
 - Cholesterol checked
 - A flu shot
- Control variables: Zip code level: Population Density
- Control variables: Individual level: Age, Income, Marital Status, Gender, Health Insurance, Current Health Status
- Methods used: Logistic Regression, Path Analysis, Multi-level Modeling

About the Center

The Center for Health Workforce Studies is based in the School of Public Health, University at Albany, State University of New York. The Center conducts studies of the supply, demand, use, and education of the health workforce and is committed to collecting and analyzing data to understand workforce dynamics and trends. One of the Center's primary goals is to inform public policy makers, the health and education sectors, and the public on health workforce issues. For more information and an inventory of the Center's reports and publications, please visit the Center's website at: <http://chws.albany.edu>.

Results:

- Density exerted a significant positive bivariate effect on the primary care MD rate
- The primary care MD rate exerted a significant positive bivariate effect on the probability of having a primary care physician
- Having a primary care physician significantly increased the likelihood of receiving preventive healthcare services.

Receiving Preventive Health Care by
Probability of Having a Primary Care Doctor

| Percent who in the past 2 years have had: | Do you have a primary care doctor? | |
|---|------------------------------------|-----|
| | No | Yes |
| Blood pressure checked | 83% | 98% |
| Cholesterol checked | 40% | 80% |
| Checked for diabetes | 33% | 65% |
| Blood stool test | 23% | 43% |
| A flu shot (within past 12 months) | 16% | 46% |

- The primary care physician rate was significantly associated with the probability of an individual having a primary care physician, even after controlling for all other factors

Logistic Regression Results

| | Blood Pressure | | Diabetes | | Cholesterol | | Flu Shot | | Blood Stool Test | |
|------------------|----------------|------|----------|------|-------------|------|----------|------|------------------|------|
| | Exp (B) | S.E. | Exp (B) | S.E. | Exp(B) | S.E. | Exp(B) | S.E. | Exp(B) | S.E. |
| Constant | 5.15 | 0.97 | .23*** | 0.41 | .10*** | 0.48 | .04*** | 0.44 | .08*** | 0.42 |
| Density | 1.00 | 0 | 1.00 | 0 | 1.00 | 0 | 1.00* | 0 | 1.00 | 0 |
| PCMD Rate | 1.02 | 0.06 | 0.99 | 0.02 | 1.01 | 0.03 | 0.99 | 0.02 | 0.98 | 0.02 |
| Health Status | .67* | 0.19 | .69*** | 0.07 | .83* | 0.08 | 0.87 | 0.07 | .86* | 0.07 |
| Age | 1.09 | 0.09 | 1.34*** | 0.04 | 1.63*** | 0.05 | 1.69*** | 0.04 | 1.64*** | 0.04 |
| Marital Status | 0.79 | 0.31 | 1.18 | 0.12 | 1.39* | 0.14 | .76* | 0.12 | 1.12 | 0.12 |
| Income | .86* | 0.07 | 1.03 | 0.03 | 1.02 | 0.03 | 0.96 | 0.03 | 1.03 | 0.03 |
| Health Insurance | 3.56*** | 0.33 | 1.68** | 0.18 | 2.46*** | 0.19 | 1.59* | 0.2 | 1.45 | 0.2 |
| Gender | 2.18** | 0.28 | 1.24 | 0.11 | 0.85 | 0.14 | 1.09 | 0.11 | .77* | 0.11 |
| PCMD | 4.72*** | 0.31 | 2.79*** | 0.19 | 4.24*** | 0.19 | 3.02*** | 0.22 | 1.73** | 0.2 |

Multi-level Modeling

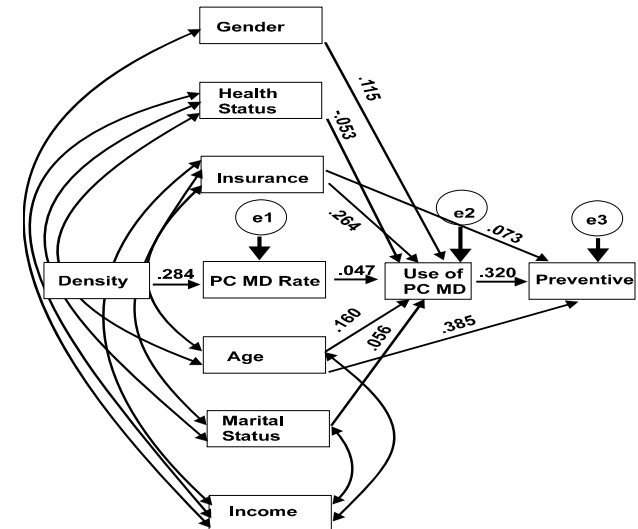
- Primary care MD rate was significantly associated with the probability of having a primary care physician. An increase in 1 primary care physician per 10,000 population resulted in a 7.2% increase in the probability of having a primary care physician.
- Controlling for population density, an increase of 1 primary care physician per 10,000 population resulted in an 8.3% increase in the probability of having a primary care physician.
- Primary care MD rate significantly affected the probability of having a primary care physician, even after controlling for all factors. An increase of 1 primary care physician per 10,000 population resulted in an 8.3% increase in the probability of having a primary care physician.
- Having a primary care physician exerted a strong effect on obtaining each of the preventive health services, even after controlling for all other factors.

Multi-level Modeling Results

| | Blood Pressure | | Cholesterol | | Diabetes | | Blood Stool Test | | Flu Shot | |
|----------------|----------------|-----|-------------|-----|----------|-----|------------------|-----|----------|-----|
| | Slope | SE | Slope | SE | Slope | SE | Slope | SE | Slope | SE |
| Intercept | 3.87*** | .20 | 1.37*** | .09 | -.33*** | .07 | -.42*** | .07 | -.33*** | .07 |
| Density | -.00 | .00 | -.00 | .00 | .00* | .00 | .00 | .00 | .00* | .00 |
| PCMD Rate | .04 | .05 | .00 | .03 | -.02 | .02 | -.02 | .03 | -.02 | .02 |
| Level 1 | | | | | | | | | | |
| Gender | .65* | .28 | -.27* | .13 | .03 | .13 | -.39*** | .12 | .03 | .13 |
| Health Status | -.49** | .17 | -.27** | .10 | -.19** | .07 | -.15* | .07 | -.19** | .07 |
| PCMD | 1.45*** | .32 | 1.60*** | .24 | 1.28*** | .26 | .83*** | .27 | 1.28*** | .26 |
| Age | .146 | .08 | .49*** | .06 | .54*** | .05 | .51*** | .05 | .54*** | .05 |
| Insurance | 1.36*** | .33 | .88*** | .17 | .61** | .22 | .27** | .22 | .61** | .22 |
| Marital Status | -.144 | .36 | .48** | .16 | -.24* | .12 | .12 | .11 | -.24* | .12 |
| Income | -.18* | .08 | -.00 | .04 | -.05 | .03 | .01 | .03 | -.05 | .03 |

Path Analysis

Time since last visit to a primary care physician ("Use of PC MD") fully mediated the relationship between gender, health status, marital status, and the sum of the 5 preventive health services ("Preventive"), and it partially mediated the relationship for health insurance and age. Use of PC MD exerted the second strongest direct effect on Preventive.



Conclusions

- The relationship between primary care physician supply and utilization of preventive health services is an indirect one.
- Primary care physician supply, at the local level, increases the probability of personally having a primary care physician. This in turn strongly increases the likelihood of receiving a variety of preventive health services.