Do Regions with More Preventive Care Have Lower Spending and Fewer Hospitalizations?

Complications from Diabetes are a major cause of hospitalizations and high Medicare spending, with about 27% of Medicare beneficiaries diagnosed with the disease (CMS, 2013). Appropriate Diabetes preventive care such as annual hemoglobin A1C tests, blood lipids LDL-C tests, and eye exams have been shown to reduce complications with Diabetes and improve quality of life (Gray et al., 2012). Despite the evidence for positive outcomes associated with more preventive care, few studies have explored the relationship between Diabetes preventive care, utilization, and spending. This brief explores the relationship of appropriate Diabetes preventive care to preventable hospitalization rates and Medicare spending per enrollee (age-sex-race adjusted).

A county-level composite measure of appropriate delivery of preventive services was created from 2013 Dartmouth Atlas data using the percentage of FFS beneficiaries ages 65-75 with an annual hemoglobin A1C test, annual blood lipids LDL-C test, and annual eye exam. Preventable (ambulatory sensitive conditions (ASC)) hospitalizations and Medicare spending were aggregated by quintile of Diabetes preventive care (composite measure). Adjusted rates were then estimated using a spatial lag model (Anselin, 1988) with controls for percent African American, percent eligible for Medicaid, percent rural, percent Medicare Advantage participation, percent with 6 or more chronic conditions, and percent dual-eligible for Medicaid.

Appropriate Diabetes Preventive Care Composite Score by Quintile

Quintiles

- ☐ Lowest
- ☐ 2nd
- ☐ 3rd
- ☐ 4th
- ☐ Highest
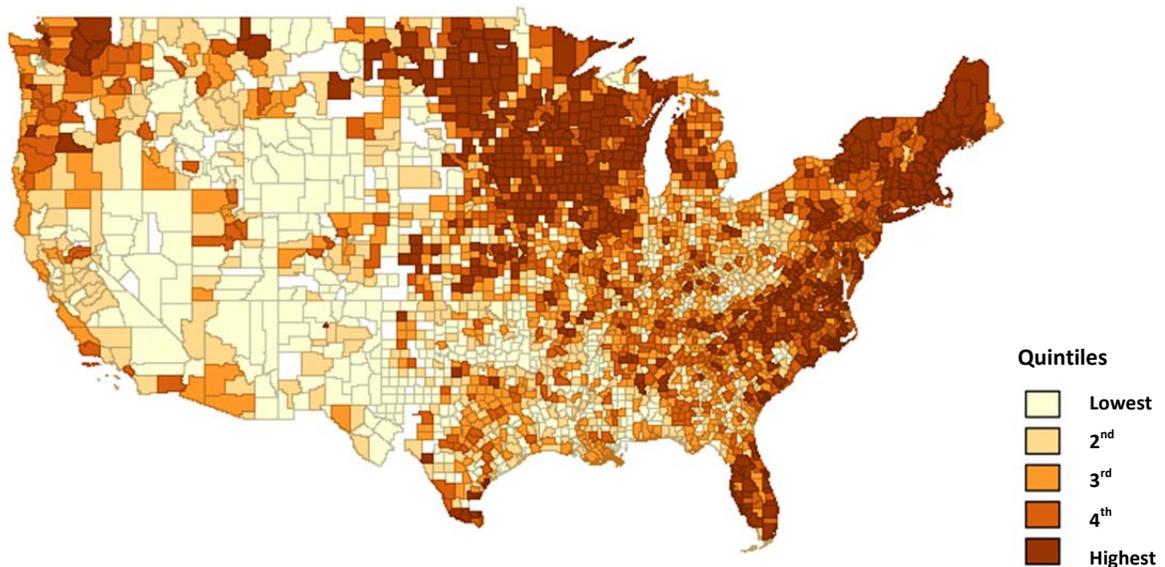
The above map displays preventive care by quintile, with the darkest counties indicating the highest quintile of preventive care, and the lightest colors indicating the lowest quintile. The map reveals strong spatial patterns, with higher rates concentrated in the upper Midwest and along the east coast in Florida, North Carolina and Virginia, and in New England. Demographic, socio-economic, and healthcare workforce characteristics vary significantly as the lowest quintile of preventive care has the highest rate of ages 65 and older in poverty [12.8% compared to 9.0% in the highest], the highest percent of dual-eligible populations [24% compared to 18.6%], the highest percentages of populations living in rural areas [64.2% compared to 53.4%], and the lowest rates of primary care physicians per 100,000 population [45.2 compared to 64.1] (ACS, 2009-2013; CMS, 2013; Dartmouth, 2011; RWJ, 2015).

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Table 1 displays the unadjusted preventable hospitalization rate and Medicare spending by preventive care quintile, which show significant variation from highest to lowest quintile. The results reveal that higher rates of preventive care are associated with a lower preventable hospitalization rate and lower spending, with significant differences between the highest and lowest quintiles.

Table 1: Hospitalizations & Costs by Quintile of Composite Preventive Care

	Overall	Lowest	2nd	3rd	4th	Highest	High-Low Diff
Number of Counties	2,975	595	595	595	595	595	
ASC Hospitalizations (per 1,000)	64.0	75.7	68.6	64.1	58.9	52.5	23.2
Costs per enrollee (Age-Sex-Race Adjusted)	$8,902	$9,151	$9,115	$8,986	$8,757	$8,499	$652

Source: Dartmouth Atlas of Healthcare, 2013

As shown in Table 2, even after adjusting for various factors, preventable hospitalization rates are still lower in counties with more preventive care, with significant differences between the highest and lowest quintile. Adjusted Medicare spending per enrollee is still lowest in the highest preventive care quintile, but the second and third quintiles have the highest spending per enrollee. The results indicate that higher rates of appropriate Diabetes preventive care are strongly associated with reduced preventable hospitalizations, and to a smaller extent, lower overall Medicare spending.

Table 2: Spatially Adjusted Hospitalizations & Costs by Quintile of Composite Preventive Care**

	Overall	Lowest	2nd	3rd	4th	Highest	High-Low Diff
ASC Hospitalizations (per 1,000)	64.1	69.3	67.3	65.2	61.1	57.5	11.8
Costs per enrollee (Age-Sex-Race Adjusted)	$8,908	$8,921	$9,020	$9,053	$8,875	$8,670	$251

Source: Dartmouth Atlas of Healthcare, 2013; American Community Survey, 2009-2013
**Adjusted for % Poverty (Age 65 & Older), % Dual-Eligible, % African American, % Rural, % with 6 or more chronic conditions, and % Medicare Advantage Participation – [Spatial Lag Model]

While this analysis was limited to Medicare, the results present a strong case for improving rates of preventive care as a strategy for reducing preventable hospitalizations and spending. In addition, the use of the spatial lag model illustrates the importance of incorporating geographic variables into analyses related to healthcare costs and utilization. Future studies should focus on what factors affect appropriate preventive care and potential barriers to access, including the impacts of Medicare Advantage and the primary care workforce, while also exploring differences across geographic regions.

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