

WENNBERG INTERNATIONAL COLLABORATIVE SPRING POLICY MEETING 2018

Decomposing Regional Variation in Publicly Funded Newborn Care

Cecilia Ganduglia¹, Youngran Kim¹, Luisa Franzini²,
Jared Wasserman³, David C. Goodman³

Institutes: 1) The University of Texas Health Science Center at Houston School of Public Health, 2) The University of Maryland School of Public Health, 3) The Dartmouth Institute for Health Policy & Clinical Practice



Smarter Health Care
National Research Programme



Variation In Newborn Care Spending

□ Background

- Cost of care is an ever present issue in the healthcare system w/ cost containment efforts gaining relevance.
- Birth/delivery is the most frequent hospital admission in the U.S.
- Medicaid pays half of all births (nationwide 45% /Texas >50%)

□ Objective

- To measure the contribution of market-level prices, utilization, and health risk to newborn spending variation among Texas Medicaid-insured newborns.

□ Study population

- Medicaid live births between January 1, 2014 and December 31, 2014 with birth weight of at least 400 grams.

□ Geographic Units

- To examine spending variation across areas reflecting geographic markets for newborn population, we created 21 neonatal intensive care regions (**NICR**) using small area analysis methods.
- Each county was assigned to the NICR that provided the highest percent of NICU admission for their newborns.

Decomposition of Spending

(White 2012; Franzini et al 2014)

$$\text{Spending} = \text{Price} \times \text{Quantity}$$

A community can have **high spending** because members are receiving **large quantities** of services, providers are being paid **high prices** or **both**

$$\text{Spending Index} = \text{Price Index} \times \text{Quantity Index} = \frac{\text{NICR mean spending}}{\text{Texas mean spending}}$$

$$\text{Price Index} = \frac{\text{sum of observed spending in NICR}}{\text{sum of hypothetical spending in NICR}}$$

1) Hypothetical spending per NICR

- a) Estimate Texas average price per unit: DRG for facility and HCPCS/CPT for professional
- b) Compute hypothetical spending per NICR: sum of region services if each unit had been paid the Texas average price

2) **Input Price Index**: adjusting for local input prices using the Medicare wage index for facility spending and the Medicare Geographical Adjustment Factors (GAF) for professional spending.

$$\text{3) Price Index} = \text{Input Price Index} \times \text{Adjusted Price Index}$$

Decomposition of Spending

(White 2012; Franzini et al 2014)

$$\text{Spending} = \text{Price} \times \text{Quantity}$$

A community can have **high spending** because members are receiving **large quantities** of services, providers are being paid **high prices** or **both**

$$\text{Spending Index} = \text{Price Index} \times \text{Quantity Index} = \frac{\text{NICR mean spending}}{\text{Texas mean spending}}$$

$$\text{Quantity Index} = \frac{\text{hypothetical NICR mean spending}}{\text{Texas mean spending}}$$

- 1) **Hypothetical spending per NICR** if each unit had been paid the Texas average price
- 2) **Health Risk Index**: relative health risk for NICR to state-wide health risk. Health risk is defined as predicted quantities from the regression using probability of 27 day death. If newborns' health in one NICR is poorer than the state average, high quantities could be partially justified as necessary utilization.
- 3) **Quantity Index = Health Risk Index x Adjusted Quantity Index**

Decomposition of Variation

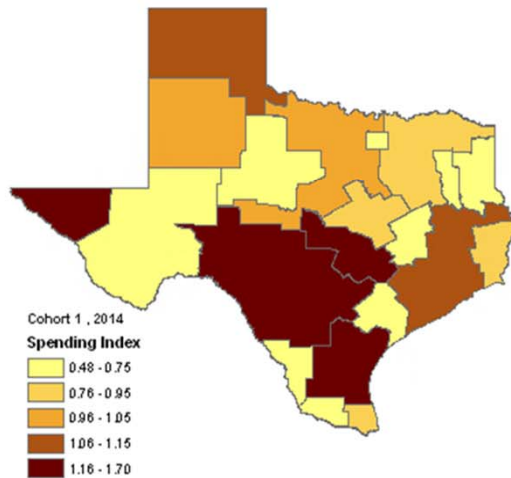
(White 2012; Franzini et al 2014)

- 1) **Coefficients of variation** (CV, standard deviation divided by the mean) to measure variation by NICR for spending overall and by service category.

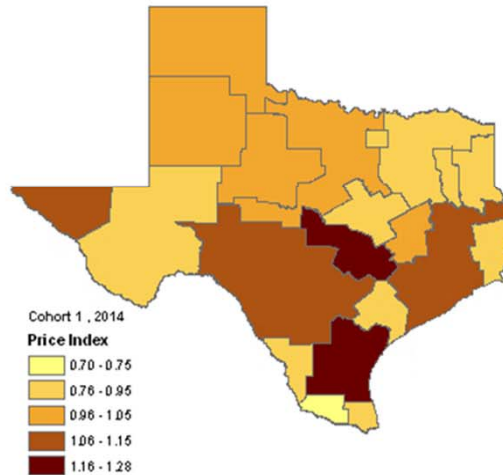
- 2) Shares of spending variation overall and in each service category for each component (indexes) was calculated in two steps using a decomposition of variance approach. (**weighted variance-covariance matrix**)
 - variation in total spending allocated among service categories
 - share of variation of each service category attributable to each index (Ln of the indices.)
 - share of variation in total spending attributable to each component (index) was then calculated by adding across service categories the share of variation attributable to each component, weighted by the share of variation in spending allocated to the corresponding service category

Spending, price & utilization variations-Texas Medicaid Newborns 2014

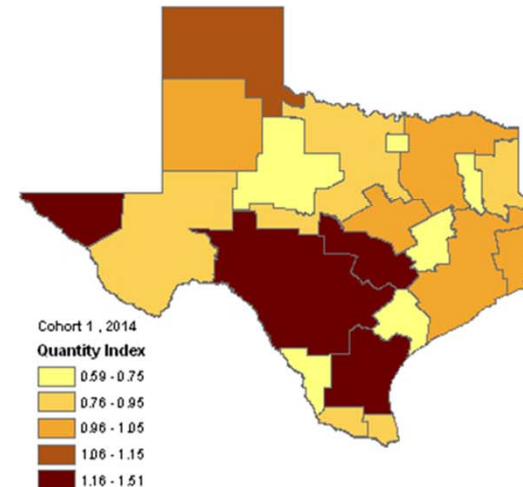
Spending



Price

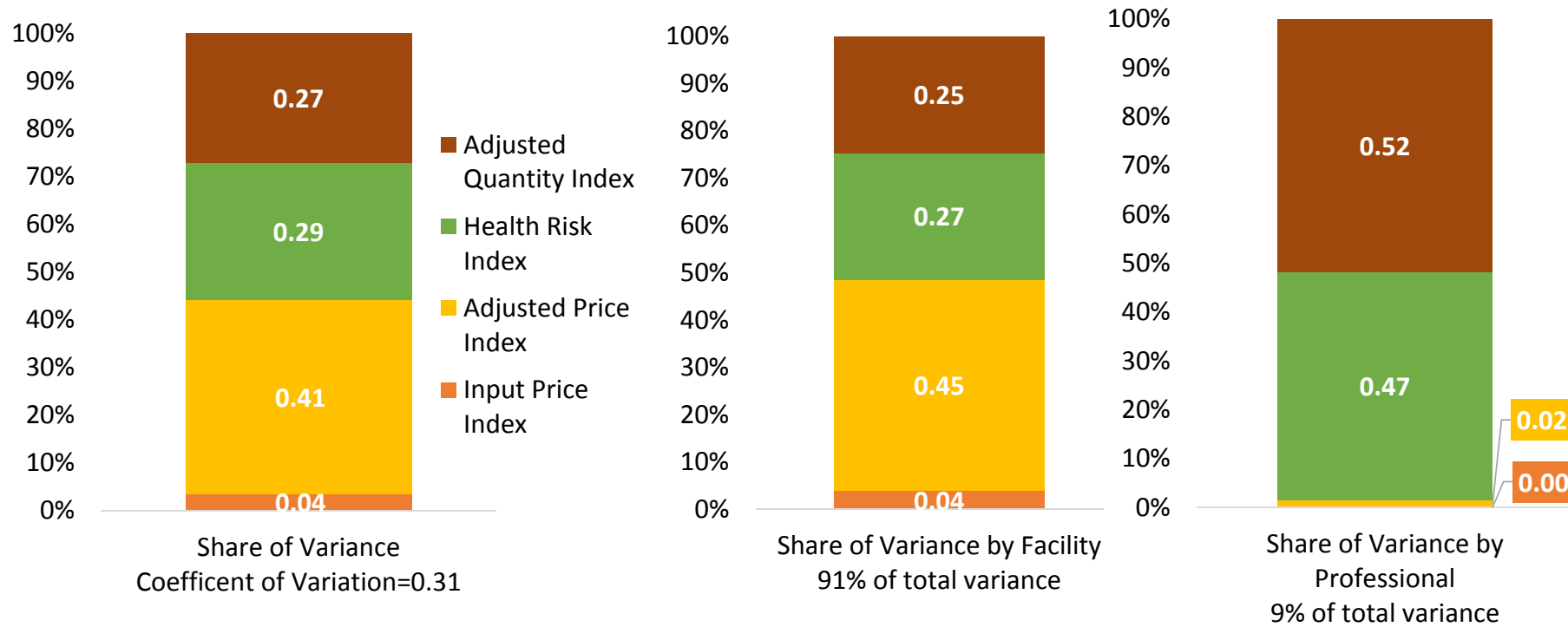


Utilization



	NICR	Laredo	Tyler	College Station	Victoria	McAllen	Denton	Longview	Abilene	Odessa	Brownsville	Temple	Dallas	Beaumont	Fort Worth	Lubbock	Houston	Amarillo	San Antonio	El Paso	Corpus Christi	Austin
Spending		0.48	0.56	0.57	0.57	0.59	0.62	0.68	0.70	0.72	0.79	0.81	0.85	0.86	0.95	1.03	1.06	1.07	1.43	1.61	1.62	1.70
Price		0.78	0.77	0.96	0.86	0.70	0.85	0.78	0.96	0.77	0.92	0.80	0.88	0.83	1.02	0.99	1.11	0.96	1.07	1.07	1.17	1.28
Utilization		0.62	0.73	0.59	0.66	0.83	0.73	0.87	0.73	0.94	0.86	1.02	0.97	1.04	0.93	1.03	0.95	1.11	1.34	1.51	1.38	1.33

Share of Variance, Overall and by Service Category-Texas Medicaid Newborns 2014



Conclusion

- ❑ **Significant spending variation exists in Medicaid newborn care across Texas**

- ❑ **Price and Utilization explain 44% and 56% of spending variation.**
 - Facility spending variation was driven by prices
 - Professional spending variation was driven by utilization
 - Health risk accounts for 29% of spending variation

- ❑ **Identifying regions with high price and excess utilization may improve efficiency in newborn care**