Dartmouth Cancer Center

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Mapping Medicaid's Reach: Gains in Early-Stage Lung Cancer Diagnosis and Persistent Disparities in Surgical Treatment in Indiana

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Background

- Lung cancer remains a leading cause of cancer morbidity and morality in the United States[1]
- Medicaid expansion has been associated with earlier diagnosis for many cancers, including lung[2]
- The variation of these effects across communities within a state are less clear

Objectives

Assess the impact of Medicaid expansion on:

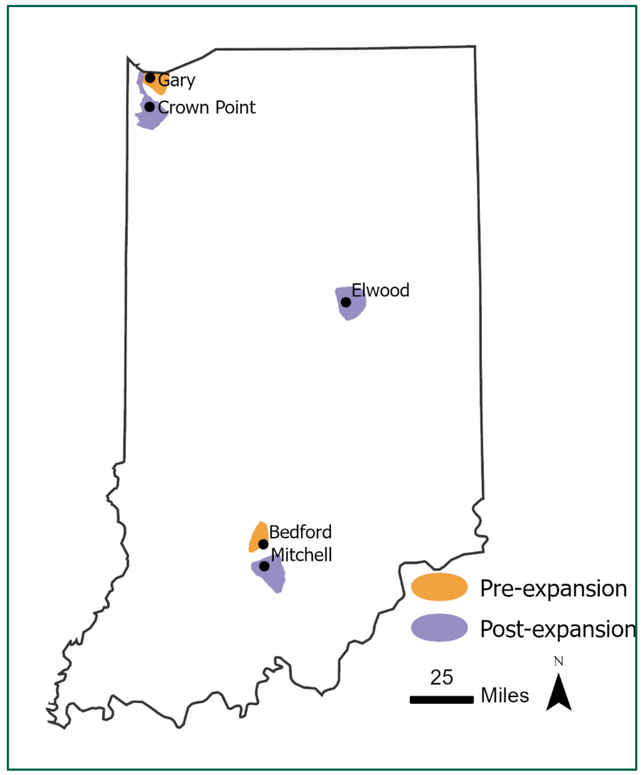
- **Late-Stage presentation** (stage III/IV)
- Rate of **Foregoing Cancer Directed Surgery (CDS)** for nonmetastatic disease

Methods

- 11,464 primary lung cancer patients under 65 years of age were identified from the Indiana State Cancer Registry
- **Geospatial hotspot analysis** assessed community-level changes
  - Patient location was disaggregated from census block group to an approximated point level
  - Kernal density ratio estimation identified hotspots of outcomes ($p<0.01$)
- **Difference-in-differences** regression was utilized to assess statewide changes
- Medicaid/self-pay was compared to privately insured before (2010-2015) and after (2015-2019) Medicaid expansion

Results

Late-Stage Cancer Hotspot Analysis



	Hotspots Count	Area of Hotspots (km²)	Hotspot Mean Rate (95% CI)	Non-Hotspot Rate
Late-Stage Cancer				
Pre-Expansion	2	373	87.5 (85.5–90.0)	71.4
Post-Expansion	3	1,060	88.8 (83.9–92.0)	68.4

- The total area of **hotspots for late-stage** disease **increased by by 687 km2 (184.3%).** There were no hotspots of foregoing CDS either pre- or post-expansion
- The **absolute rate of late-stage cancer** remained markedly **higher in hotspot (88.8%)** vs non-hotspot (68.4%)
- There was **a 7.0 percentage-point decrease in late-stage cancer (p=0.002)** but a nonsignificant decrease in foregoing CDS for Medicaid/self-pay patients after expansion
- The rate of foregoing CDS for Medicaid/self-pay was 14.5 pp higher than private insurance after expansion

Difference-in-Differences

	Medicaid/Self Pay			Private Insurance			Difference-in-Differences Change (p-value)	
	Pre	*Post*	*Diff*	*Pre*	*Post*	*Diff*	*Unadjusted*	*Adjusted*
Late Stage	1,184 (80.2%)	865 (72.9%)	- 7.3 pp	1,597 (69.9%)	1,666 (69.1%)	-0.8 pp	**- 6.5 pp (p=0.003)**	**- 7.0 pp (p=0.002)**
Forego CDS	266 (55.5%)	241 (53.0%)	- 2.5 pp	351 (35.1%)	402 (38.5%)	+3.4 pp	- 5.9 pp (p=0.126)	- 2.1 pp (p=0.555)

Discussion

- There are multilevel drivers of cancer inequities, with only **late-stage diagnoses being influenced by the population-level expansion of Medicaid**
- Limitations: restricting the analysis to a single state may limit the generalizability, data suppression for confidentiality may mask smaller inequities

Conclusions

- Medicaid expansion improved timely diagnosis of lung cancer, but increased hotspots of late-stage cancer suggests heterogeneity of policy effects
- No geospatial variation in foregoing CDS, but persistent insurance-based disparities highlight the need for targeted interventions beyond Medicaid expansion alone

References:

1: Cancer statistics, 2025 - Siegel - 2025 - CA: A Cancer Journal for Clinicians - Wiley Online Library. Accessed July 26, 2025. https://acsjournals.onlinelibrary.wiley.com/doi/10.3322/caac.21871

2: Ermer T, Walters SL, Canavan ME, et al. Understanding the Implications of Medicaid Expansion for Cancer Care in the US: A Review. *JAMA Oncol*. 2022;8(1):139-148. doi:10.1001/jamaoncol.2021.4323