The Value of a Hospital Obstetric Unit: Access, Costs, and Health

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October 9, 2026

Introduction

- **OB provision**: hospitals' decisions to operate obstetric (OB) units.
- OB provision rates are lower among rural hospitals and declining overall.
- *How does OB provision affect access to care, the costs of delivering care, and maternal and infant health?*



Source: University of Iowa Health Care.

Welfare Effects of OB Provision

- **Access-to-care** (+): giving mothers an additional option.
- **Fixed cost** (−): paid by the OB hospital.
- **Variable cost** (+/−): the OB hospital may have higher or lower marginal costs than its competitors.
- **Maternal and infant health** (+/−): the OB hospital may be higher-quality or lower-quality than its competitors.

Stylized Model

This Paper

- Setting: **Arkansas in 2022**.
- Estimate a model of the hospital OB care market, quantify the effects of each hospital's OB provision, and evaluate policies.
- Preview of findings:
  - Large access-to-care benefits, but variable cost and maternal and infant health effects are small and mixed in sign.
  - Net externality of OB provision: **$104 per Arkansas birth**.
  - **Medicaid price hike**: benefit is 1.0 to 1.5 times its cost.
  - **OB unit subsidy**: benefit is 1.2 to 4.2 times its cost.

Related Literature

Outline

Setting and Model

Effects of OB Provision

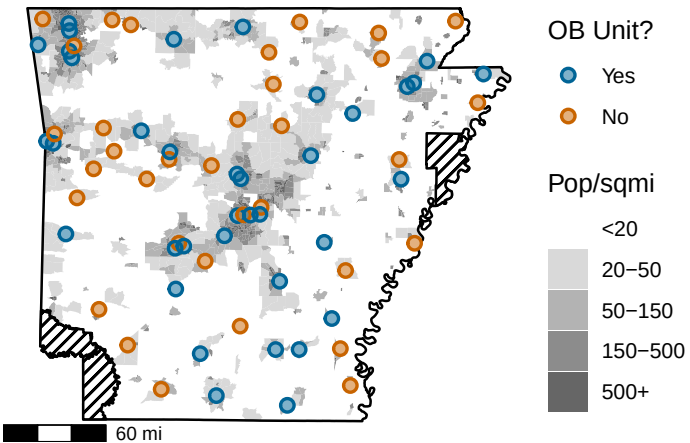
Policy Evaluation

Conclusion

Setting: Arkansas in 2022

- 71 hospitals, 37 with OB units and 34 without.
- Data from All-Payer Claims Database: births and medical claims.

History | Data | Summary Statistics | Demand Descriptive | Health Descriptive



Model Overview

0. Hospital systems make OB provision decisions.

1. Commercial prices are set by bargaining between commercial insurers and hospital systems.

2. Mothers choose OB hospitals, and maternal and infant health is determined.

Timing of Shocks | Demand and Health | Commercial Price-Setting | OB Provision

Outline

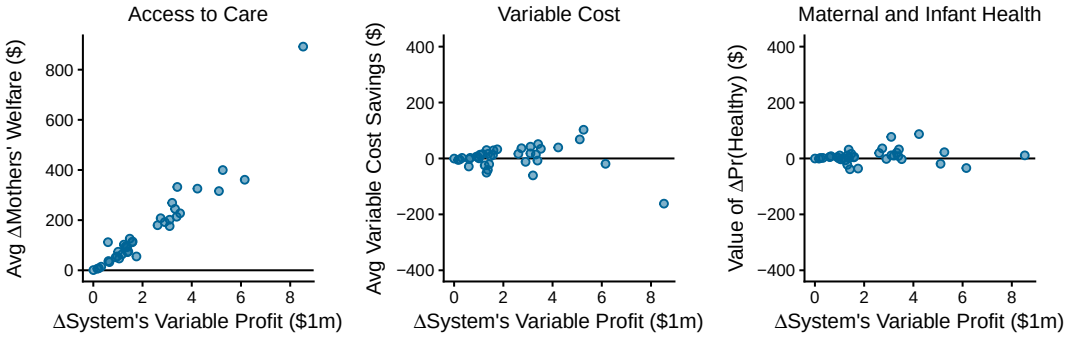
Setting and Model

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Access to Care Dominates the Effects of OB Provision



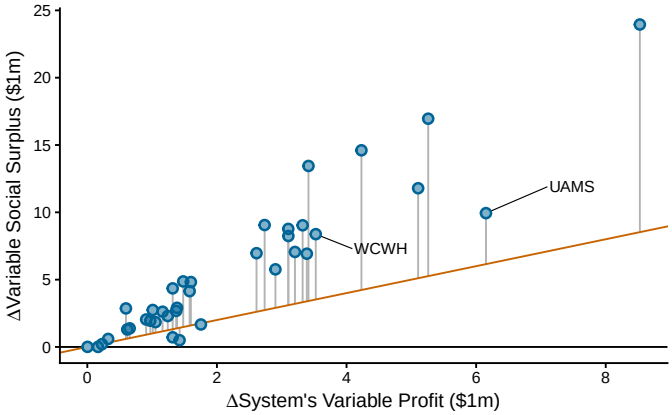
- Average OB unit, per Arkansas birth: $162 in access to care, $4 in variable cost, $8 in maternal and infant health.

Details | Heterogeneity | Distance | Role of Distance

OB Hospitals Generate Positive Net Externalities

- Average net externality: $3.37 million (**$104 per Arkansas birth**)

Rural/Urban



Outline

Setting and Model

Effects of OB Provision

Policy Evaluation

Conclusion

Medicaid Price Hike: Benefit Is 1.0 to 1.5 Times Its Cost

	OB Closures (Out of 37)	ΔSocial Welfare ($1m)	MVPF
$100k Fixed Cost Increase	[2.1, 6.2]	–	–
+ Medicaid Price +70%	1	[+0.8, +11.6]	[1.03, 1.40]
$200k Fixed Cost Increase	[3.3, 7.8]	–	–
+ Medicaid Price +70%	[1.7, 1.9]	[+1.7, +13.3]	[1.06, 1.46]
$300k Fixed Cost Increase	[4.5, 9.7]	–	–
+ Medicaid Price +70%	[2.6, 3.7]	[+2.7, +15.7]	[1.09, 1.54]

Policy Evaluation | Full Results | Welfare Components | Heterogeneity | Distance | Role of Distance | Rural/Urban

OB Unit Subsidy: Benefit Is 1.2 to 4.2 Times Its Cost

	OB Closures (Out of 37)	ΔSocial Welfare ($1m)	MVPF
$100k Fixed Cost Increase	[2.1, 6.2]	–	–
+ OB Subsidy $100k	0	[+0.9, +11.6]	[1.24, 4.17]
$200k Fixed Cost Increase	[3.3, 7.8]	–	–
+ OB Subsidy $200k	0	[+1.8, +13.5]	[1.24, 2.83]
$300k Fixed Cost Increase	[4.5, 9.7]	–	–
+ OB Subsidy $300k	0	[+3.1, +19.1]	[1.28, 2.70]

Full Results | Welfare Components | Heterogeneity | Distance | Role of Distance | Rural/Urban

Outline

Setting and Model

Effects of OB Provision

Policy Evaluation

Conclusion

Conclusion

- How does OB provision affect access to care, the costs of delivering care, and maternal and infant health?
- OB units generate positive net externalities, mostly through access to care.
- A Medicaid price hike keeps OB units open and improves welfare.
- An OB unit subsidy achieves the same goal more cost-effectively.

Appendix

References I

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Stylized Model I

- Mothers distributed uniformly between Hospitals A and B.
- If only Hospital A operates an OB unit,

$$\text{Welfare}_{\text{A only}} = -\text{TravelCosts}_{\text{A only}} - \text{FC} - \text{MC}_{\text{A}} + \text{Health}_{\text{A only}} \quad (1)$$

- If Hospital B also operates an OB unit,

$$\text{Welfare}_{\text{A and B}} = -\text{TravelCosts}_{\text{A and B}} - 2\text{FC} - (\text{MC}_{\text{A}} + \text{MC}_{\text{B}})/2 + \text{Health}_{\text{A and B}} \quad (2)$$

- Net effect:

$$\Delta\text{Welfare} = \underbrace{(-\Delta\text{TravelCosts})}_{>0} + \underbrace{(-\text{FC})}_{<0} + \underbrace{(\text{MC}_{\text{A}} - \text{MC}_{\text{B}})/2}_{>0 \text{ or } <0} + \underbrace{(\Delta\text{Health})}_{>0 \text{ or } <0} \quad (3)$$

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Stylized Model II

- Relative to the welfare-maximizing outcome, OB provision is too low if

$$\pi_B < \text{FC} < -\Delta\text{TravelCosts} + (\text{MC}_A - \text{MC}_B)/2 + \Delta\text{Health} \tag{4}$$

- OB provision is too high if

$$-\Delta\text{TravelCosts} + (\text{MC}_A - \text{MC}_B)/2 + \Delta\text{Health} < \text{FC} < \pi_B \tag{5}$$

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Stylized Model III

- Net externality of Hospital B's OB provision:

$$\text{Externality} = -\Delta\text{TravelCosts} + (\text{MC}_\text{A} - \text{MC}_\text{B})/2 + \Delta\text{Health} - \pi_\text{B} \qquad (6)$$

- Effect on variable social surplus minus effect on private surplus.

- Alternatively:

$$\text{Externality} = \underbrace{(-\Delta\text{TravelCosts})}_{>0} + \underbrace{(\text{MC}_\text{A} - p)/2}_{<0} + \underbrace{(\Delta\text{Health})}_{>0 \text{ or } <0} \qquad (7)$$

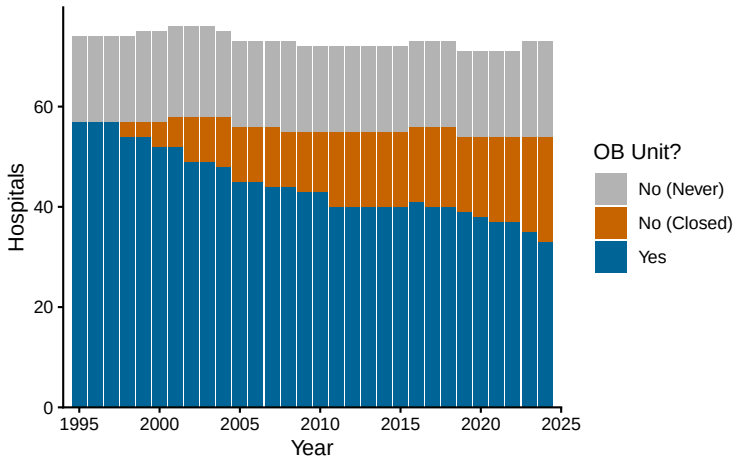
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Related Literature

- **OB unit closures** (Avdic et al., 2024; Battaglia, 2025; Fischer et al., 2024; Kozhimannil et al., 2018)
- **Optimal firm entry** (Berry et al., 2016; Cutler et al., 2010)
- Contribution: combine health with other components of welfare, estimate hospital-specific OB provision effects for all OB hospitals, and evaluate policies.
- Methods:
  - **Provider quality** (Einav et al., 2025; Geweke et al., 2003; Olenski & Sacher, 2024)
  - **Models of hospital markets** (Gowrisankaran et al., 2015)
  - **Pure characteristics demand** (Cuesta & Tebaldi, 2025)
  - **Fixed cost estimation** (Eizenberg, 2014)

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History of OB Provision in Arkansas



Back

Data

- **Arkansas All-Payer Claims Database** (2022):
  - All births (e.g., mothers' characteristics, OB hospitals, maternal and infant health).
  - Medical claims for commercial and Medicaid residents (e.g., payments, out-of-pocket spending, insurers, networks).
- **AHA Annual Survey**: hospital characteristics (e.g., for-profit status, beds, NICUs).
- **CMS**, **Census**: hospital quality, regional wages, supplemental payments, demographics.

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Birth Summary Statistics

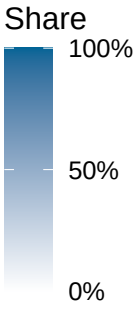
	Commercial	Medicaid	Other
Mean			
Distance (mi)	16.6	16.8	13.8
Any Adverse Outcome	0.03	0.03	0.03
Payment ($)	8399	2962	—
Out-of-pocket ($)	1180	0	—
Observations	18003	13360	944

- **Adverse outcome**: *maternal* (perineal laceration, blood transfusion, unplanned hysterectomy, uterine rupture) or *infant* (Apgar<4, death, injury, seizure)

Back | Full Summary Statistics | By Match | By Quarter | Adverse Outcomes | Hospital Summary Statistics | Data Cleaning

Half of Mothers Choose Their Nearest Option

	Nearest	2nd	3rd	4th	5th
All Births	**50.0%**	27.2%	9.5%	4.4%	3.1%
Medicaid	**52.5%**	25.8%	9.1%	3.7%	3.1%
Rural	**56.9%**	16.3%	8.7%	4.8%	3.5%
Age 35+	**48.1%**	28.6%	8.4%	4.6%	2.9%
Prior Births>0	**50.3%**	27.1%	9.3%	4.3%	3.1%



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Health Depends on the Hospital, Not Distance

	Avg ΔPr(Healthy) (%)
Distance to Nearest Option	
Per Mile	0.013
	(0.019)
Per Standard Deviation (8.6 mi)	0.115
	(0.159)
Nearest-Option Effects	
Standard Deviation Across Hospitals	0.566
	(0.218)
Observations	19843

Back Details Home Locations

Full Birth Summary Statistics

	Commercial	Medicaid	Other
Mean			
Distance (mi)	16.6	16.8	13.8
Any Adverse Outcome	0.03	0.03	0.03
Matched to Claims	0.53	0.79	0
Payment ($)	8399	2962	—
Out-of-pocket ($)	1180	0	—
ARHOME	0.50	0	0
Age (yr)	28.6	26.0	28.7
BMI	28.8	29.0	27.3
Prior Births>0	0.57	0.67	0.69
Prior C-sections>0	0.14	0.16	0.09
Rural	0.29	0.38	0.28
Prenatal Visits	11.0	9.3	9.0
Gestational Age (wk)	38.2	38.1	38.8
Planned C-section	0.22	0.22	0.13
Outside Option	0.009	0.009	0.327
UAMS (Teaching)	0.070	0.132	0.051
WCWH (Women's)	0.051	0.067	0.146
Public	0.08	0.16	0.07
Non-profit	0.74	0.63	0.40
For-profit	0.17	0.20	0.21
NICU	0.57	0.51	0.47
Non-OB Beds	301.8	251.5	155.1
Observations	18003	13360	944

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Birth Summary Statistics, by Match to Claims Data

	Commercial (Matched)	Commercial (Not Matched)	Medicaid (Matched)	Medicaid/Other (Not Matched)
Mean				
Distance (mi)	17.4	15.7	17.1	15.3
Any Adverse Outcome	0.03	0.02	0.03	0.03
Age (yr)	28.0	29.2	25.7	27.4
BMI	28.9	28.6	29.0	28.7
Prior Births>0	0.58	0.56	0.66	0.70
Prior C-sections>0	0.14	0.15	0.16	0.14
Rural	0.34	0.25	0.39	0.31
Prenatal Visits	10.8	11.2	9.3	9.2
Gestational Age (wk)	38.2	38.3	38.1	38.3
Planned C-section	0.22	0.21	0.22	0.20
Outside Option	0.013	0.003	0.011	0.083
UAMS (Teaching)	0.086	0.053	0.117	0.154
WCWH (Women's)	0.048	0.054	0.059	0.107
Public	0.10	0.06	0.15	0.18
Non-profit	0.72	0.76	0.65	0.52
For-profit	0.16	0.18	0.20	0.22
NICU	0.54	0.60	0.50	0.55
Non-OB Beds	296.1	308.3	250.6	230.0
Observations	9561	8442	10526	3778

Back

Birth Summary Statistics, by Quarter

	Jan–Mar	Apr–Jun	Jul–Sep	Oct–Dec
Mean				
Distance (mi)	16.7	16.4	16.9	16.4
Any Adverse Outcome	0.03	0.03	0.03	0.03
Payment ($)	5614	5524	5477	5588
Out-of-pocket ($)	552	509	470	443
Commercial	0.56	0.56	0.55	0.56
Medicaid	0.41	0.41	0.42	0.41
Other	0.04	0.02	0.03	0.03
Age (yr)	27.5	27.5	27.3	27.6
BMI	28.8	28.9	28.7	28.9
Prior Births>0	0.61	0.62	0.61	0.62
Prior C-sections>0	0.14	0.15	0.15	0.15
Rural	0.33	0.32	0.34	0.31
Prenatal Visits	10.1	10.3	10.2	10.4
Gestational Age (wk)	38.2	38.2	38.2	38.2
Planned C-section	0.21	0.22	0.22	0.21
Outside Option	0.017	0.020	0.018	0.018
UAMS (Teaching)	0.096	0.096	0.092	0.099
WCWH (Women's)	0.064	0.061	0.058	0.057
Public	0.12	0.12	0.11	0.12
Non-profit	0.68	0.68	0.69	0.68
For-profit	0.19	0.18	0.18	0.18
NICU	0.54	0.55	0.53	0.55
Non-OB Beds	275.3	277.0	271.6	283.2
Observations	7835	7776	8530	8166

Back

Adverse Outcome Rates

	Mean
Maternal	
Perineal Laceration	0.0065
Blood Transfusion	0.0055
Unplanned Hysterectomy	0.0005
Uterine Rupture	0.0003
Infant	
Apgar<4	0.0101
Death	0.0068
Injury	0.0005
Seizure	0.0002
Observations	32307

Back

Hospital Summary Statistics

	OB Unit	No OB Unit
Count		
UAMS (Teaching)	1	0
WCWH (Women's)	1	0
Public	4	5
Non-profit	25	26
For-profit	8	3
NICU	9	0
Mean		
Non-OB Beds	157.5	53.0
Patient Reviews (1 SD)	−0.38	0.41
Patient Outcomes (1 SD)	−0.29	0.31
Wage Index (1 SD)	0.3	−0.3
Observations	37	34

Back

Data Cleaning

- Drop counties near Memphis/Texarkana, mothers who live outside my setting, and births after the first for twins/triplets.
- Home locations are observed at county level: impute expected distances to hospitals based on county and age.
- Assign each birth to claims by matching on *person identifier* (encrypted combination of mother's name, date of birth, sex), dates of coverage and service, hospital NPIs, and labor and delivery diagnosis/procedure codes.
- A birth may not match if the insurer is not in APCD (e.g., self-insured employers, small insurers, Medicare, VA, self-pay) or data are misreported.
- Drop insurers with <10 births with claims and insurers with <2 in-network OB hospitals.

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Descriptive Evidence About Health: Details

- Estimate with MLE:

$$\text{Healthy}_i = \mathbb{1}\left(\tau'\mathbf{x}_i + \tau^{\text{Dist}}\text{DistNearest}_i + \sum_j \phi_j \mathbb{1}\left(j \text{ nearest to } i\right) + \omega_i > 0\right) \quad (8)$$

$$\omega_i \sim \text{N}(0,1), \quad \phi_j \sim \text{N}\left(0, \sigma_\phi^2\right) \quad (9)$$

- $\mathbf{x}_i = 1$, age, race, BMI, diabetes, hypertension, smoker, prior births>0, prior c-sections>0, ln(home county pop density), home county pop shares by income bin.

- Assumptions: mothers tend to choose their nearest option, and home locations are unrelated to unobserved underlying health conditional on observed characteristics.

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Home Locations Are Unrelated to Unobserved Shocks I

	Attribute of Nearest Option			
Proxy for Unobserved Shocks	Distance (mi)	UAMS	NICU	ln(Non-OB Beds)
Conditional on $\mathbf{x}_i^{\text{demand}}$				
Married	0.063	−0.071	−0.058	0.006
	(0.647)	(0.072)	(0.045)	(0.085)
High School	−0.249	0.027	−0.005	0.009
	(0.334)	(0.034)	(0.035)	(0.036)
Hepatitis C	−0.584	−0.056	0.054	0.088
	(0.729)	(0.073)	(0.086)	(0.100)
Height (per SD, 2.8 in)	−0.023	0.010	−0.003	0.010
	(0.101)	(0.012)	(0.011)	(0.012)
NO_2 (per SD, 1.5 ppb)	0.035	0.190	0.167	0.119
	(1.735)	(0.201)	(0.121)	(0.214)
Observations	19843			

Back

Home Locations Are Unrelated to Unobserved Shocks II

	Attribute of Nearest Option			
Proxy for Unobserved Shocks	Distance (mi)	UAMS	NICU	ln(Non-OB Beds)
Conditional on $\mathbf{x}_i^{\text{health}}$				
Married	−0.069	−0.001	−0.002	0.012
	(0.169)	(0.006)	(0.013)	(0.017)
High School	−0.206	−0.003	0.005	0.020
	(0.264)	(0.011)	(0.017)	(0.022)
Hepatitis C	−0.119	−0.042	0.017	−0.026
	(0.684)	(0.057)	(0.049)	(0.055)
Height (per SD, 2.8 in)	0.030	0.001	−0.001	0.004
	(0.055)	(0.002)	(0.003)	(0.006)
NO_2 (per SD, 1.5 ppb)	0.225	0.122	0.041	0.029
	(1.545)	(0.139)	(0.110)	(0.156)
Observations	19843			

Back

Timing of Shocks

0. **Fixed cost** (u_j) shocks are realized. Then, hospital systems make OB provision decisions.

1. **Demand-based quality** (ξ_j), **health-based quality** (λ_j), and **marginal cost** (e_{mj}) shocks are realized. Then, commercial prices are set by bargaining between commercial insurers and hospital systems.

2. **Preference** ($\boldsymbol{\nu}_i$) and **underlying health** (ϵ_i) shocks are realized. Then, mothers choose OB hospitals, and maternal and infant health is determined.

Back

Demand and Health Model

- Utility of mother *i* choosing OB hospital *j*:

$$u_{ij} = -\alpha \text{OOP}_{ij} - \beta_i \left(\text{Dist}_{ij} + \eta \text{Dist}_{ij}^2\right) + \boldsymbol{\gamma}_i' \mathbf{y}_j + \xi_j \tag{10}$$

where

$$\ln \beta_i = \delta_0^{\text{Dist}} + \boldsymbol{\delta}^{\text{Dist}\prime} \mathbf{x}_i + \nu_i^{\text{Dist}} \tag{11}$$

$$\gamma_i^k = \delta_0^k + \boldsymbol{\delta}^{k\prime} \mathbf{x}_i + \nu_i^k \quad \text{for all hospital characteristics } k \tag{12}$$

- Maternal and infant health (defined as *no adverse outcome*):

$$\text{Healthy}_{ij} = \mathbb{1}\left(\boldsymbol{\zeta}' \mathbf{x}_i + \boldsymbol{\kappa}' \mathbf{y}_j + \boldsymbol{\mu}' \mathbf{z}_{ij} + \lambda_j + \epsilon_i > 0\right) \tag{13}$$

- $\begin{pmatrix} \boldsymbol{\nu}_i \\ \epsilon_i \end{pmatrix} \sim \text{N}\left(0, \Sigma_{\nu\epsilon}\right)$ and $\begin{pmatrix} \xi_j \\ \lambda_j \end{pmatrix} \sim \text{N}\left(0, \Sigma_{\xi\lambda}\right)$

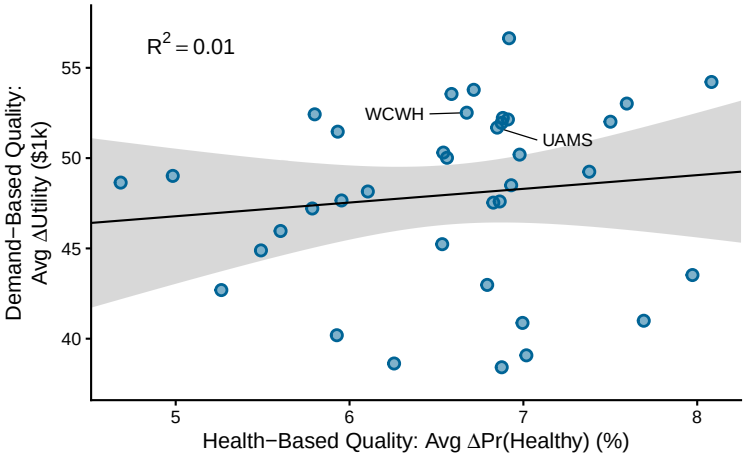
Back | Demand Details | Health Details | Insurers | Choice Sets | Predicted Prices | Article

Demand and Health Results

	Median ΔUtility ($)	Avg ΔPr(Healthy) (%)
Distance (mi)	−225.86 (69.91)	−0.02138 (0.00922)
	Avg ΔUtility ($)	Avg ΔPr(Healthy) (%)
2×Non-OB Beds	3638.0 (2198.3)	−0.187 (0.383)
Observations	20087	

Back Full Results Estimation

Demand-Based Quality Is Not Health-Based Quality



Back

Demand Model Details

- $\mathbf{x}_i$ = Medicaid, ARHOME, age, BMI, prior births>0, prior c-sections>0, ln(home county pop density).
- $\mathbf{y}_j$ = outside option, UAMS, WCWH, NICU, ln(non-OB beds), patient reviews index based on Medicare survey.
- No observed or unobserved heterogeneity in preferences for the outside option or WCWH. Assume Cov $(\boldsymbol{\nu}_i)$ is diagonal.
- Normalize: $\alpha = 1$ and $(\xi_{\text{outside}}, \xi_{\text{UAMS}}, \xi_{\text{WCWH}}) = 0$

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Health Model Details

- $\mathbf{x}_i = 1$, Medicaid, ARHOME, *demographics* (age, race), *pre-existing health* (BMI, diabetes, hypertension, smoker), *pregnancy history* (prior births>0, prior c-sections>0), *home county characteristics* (ln(pop density), pop shares by income bin).
- $\mathbf{y}_j =$ outside option, UAMS, NICU, ln(non-OB beds), patient outcomes index based on Medicare mortality and readmission rates for pneumonia/COPD/heart failure.
- $\mathbf{z}_{ij} =$ distance, {distance, UAMS, NICU, ln(non-OB beds), patient outcomes index} $\times$ {age, BMI, prior births>0, prior c-sections>0}.
- Normalize: $\text{Var}(\epsilon_i) = 1$ and $(\lambda_{\text{outside}}, \lambda_{\text{UAMS}}) = 0$

Back

Assumption: Insurers Are Exogenous I

Payer Type	Births	Insurers
Medicaid	10526	1
ARHOME	4776	23
Employer-Sponsored	2406	35 (avg 1.3 in group)
State Employee	1262	7
ACA Marketplace	1117	19
Total	20087	85

Back

Assumption: Insurers Are Exogenous II

	Commercial	Medicaid
Had Birth Insurer Before Pregnancy (%)	73.6	61.7
Any Other Insurer During Pregnancy (%)	28.7	9.1
With Higher OOP (%)	3.4	5.2
With Equal OOP (%)	19.1	4.2
With Lower OOP (%)	7.1	0
Observations	2216	2368

Back

Choice Set: In-Network OB Hospitals + Outside Option

- In-network: insurer *m* has at least 1 birth with claims data, or at least 10 non-birth-related claims, in hospital *j*'s system.
- All hospitals are in-network for Medicaid.
- Outside option: out-of-network OB hospitals, non-OB hospital emergency rooms, birth centers, home births.
- Assume outside option has insurer-level average price.

Back

Predicted Prices I

- Observed for mother i with insurer m choosing hospital j:

$$\text{Payment}_{ij} = r_i p_{mj} \tag{14}$$

$$\text{OOP}_{ij} = \text{Copay}_i + \text{Deductible}_i + \text{CoinsuranceRate}_i \left(\text{Payment}_{ij} - \text{Copay}_i - \text{Deductible}_i \right) \tag{15}$$

- r_i is resource use intensity, and p_{mj} is price per unit of intensity.

Back

Predicted Prices II

- Estimate

$$\ln \text{Payment}_{ij} = \boldsymbol{\rho}' \mathbf{x}_i + \text{FE}_{mj} + v_{ij}, \quad \text{E}\left[v_{ij}\right] = 0 \tag{16}$$

  where $\mathbf{x}_i$ is the same as in the descriptive evidence about health.

- $\widehat{r_i} \approx \exp\left(\hat{\boldsymbol{\rho}}' \mathbf{x}_i\right)$ and $\hat{p}_{mj} \approx \exp\left(\widehat{\text{FE}}_{mj}\right)$
- Two adjustments:
  - Apply empirical Bayes shrinkage to $\widehat{\text{FE}}_{mj}$. Price Shrinkage
  - Adjust $\widehat{r_i}$ and $\hat{p}_{mj}$ to account for Jensen's inequality.
- Normalize average of r_i to 1, so p_{mj} is price of an average birth.

Back

Applying Shrinkage to Predicted Prices

- Hierarchical model:

$$\mathrm{FE}_{mj} = \mathrm{FE}_m + \mathrm{FE}_j + \tilde{v}_{mj}, \quad \mathrm{E}\left[\tilde{v}_{mj}\right] = 0 \tag{17}$$

  where FE_{mj}, FE_m, and FE_j are estimated with normal error.

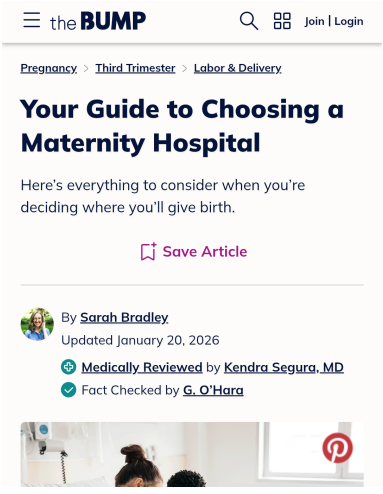
- Apply empirical Bayes shrinkage to get shrunk versions of $\widehat{\mathrm{FE}}_m$, $\widehat{\mathrm{FE}}_j$, and $\widehat{\mathrm{FE}}_{mj}$.

- $\widehat{\mathrm{FE}}_{mj}$ is shrunk toward $\widehat{\mathrm{FE}}_m + \widehat{\mathrm{FE}}_j$. If insurer-hospital pair *mj* has no birth with claims data, then $\widehat{\mathrm{FE}}_{mj} = \widehat{\mathrm{FE}}_m + \widehat{\mathrm{FE}}_j$ exactly.

- Note: use unshrunk prices only when subtracting markups to infer marginal costs in commercial price-setting estimation.

Back

How Do Mothers Choose OB Hospitals?



Key Takeaways

- When looking for maternity hospitals for delivery, it's common to seek those with high-quality ratings, plenty of staffing, transparency around patient rights and a collaborative approach to labor and postpartum support.
- Take a tour of your maternity hospital to make sure it's a good fit for you and be prepared to ask questions about what your birth and recovery experience will look like.
- Don't forget to choose a provider and hospital that's in-network with your insurance plan, and call ahead to get an estimated cost as well as information about co-pays and deductibles.

Back

Demand and Health Results: Distance

	Median ΔUtility ($)	Avg ΔPr(Healthy) (%)
Distance (mi)	−225.86	−0.02138
	(69.91)	(0.00922)
ΔEffect of Distance per ΔDistance	−18.85	
	(11.36)	
ΔEffect of Distance (mi) per Δx_j:		
Medicaid	−108.49	
	(43.05)	
ARHOME	−86.47	
	(38.52)	
Age (yr)	−0.01	−0.00056
	(1.75)	(0.00066)
BMI	1.73	0.00099
	(1.34)	(0.00054)
Prior Births>0	−41.16	0.01006
	(24.77)	(0.00978)
Prior C-sections>0	39.20	0.00004
	(25.33)	(0.01379)
2×Pop Density	−70.67	
	(30.10)	
	Avg ΔUtility ($)	
Distance (mi)	−937.19	
	(476.91)	
Observations	20087	

Back

Demand and Health Results: Hospital Size

	Avg ΔUtility ($)	Avg ΔPr(Healthy) (%)
2×Non-OB Beds	3638.0	−0.187
	(2198.3)	(0.383)
ΔEffect of 2×Non-OB Beds per Δx_i:		
Medicaid	−261.3	
	(357.4)	
ARHOME	−166.4	
	(345.2)	
Age (yr)	119.0	−0.001
	(33.1)	(0.014)
BMI	59.0	0.024
	(15.7)	(0.013)
Prior Births>0	−521.1	0.168
	(156.0)	(0.179)
Prior C-sections>0	633.3	0.123
	(376.9)	(0.288)
2×Pop Density	350.3	
	(129.1)	
Observations	20087	

Back

Demand and Health Results: NICU

	Avg ΔUtility ($)	Avg ΔPr(Healthy) (%)
NICU	−1014.4	0.762
	(2746.2)	(1.122)
ΔEffect of NICU per Δx_i:		
Medicaid	−1117.8	
	(900.3)	
ARHOME	−1301.8	
	(704.1)	
Age (yr)	−32.6	0.069
	(31.6)	(0.060)
BMI	−73.9	0.003
	(33.6)	(0.033)
Prior Births>0	−132.7	−0.335
	(288.0)	(0.759)
Prior C-sections>0	−978.6	−0.283
	(582.5)	(0.867)
2×Pop Density	99.5	
	(207.0)	
Observations	20087	

Back

Demand and Health Results: UAMS, WCWH, Outside Option

	Avg ΔUtility ($)	Avg ΔPr(Healthy) (%)
UAMS	−2993.0	0.247
	(5811.2)	(1.378)
ΔEffect of UAMS per Δx_j:		
Medicaid	5163.3	
	(1761.2)	
ARHOME	2610.8	
	(902.7)	
Age (yr)	74.1	−0.086
	(34.1)	(0.058)
BMI	66.6	−0.104
	(28.3)	(0.040)
Prior Births>0	476.5	−1.495
	(389.0)	(0.655)
Prior C-sections>0	−4349.6	1.631
	(1607.5)	(1.198)
2×Pop Density	336.4	
	(196.6)	
WCWH	9643.4	
	(3726.0)	
Outside Option	−23239.0	−4.638
	(6573.9)	(2.415)
Observations	20087	

Back

Demand and Health Results: Patient Reviews

	Avg ΔUtility ($)
Patient Reviews (1 SD)	−262.0
	(1566.6)
ΔEffect of Patient Reviews (1 SD) per Δx_i:	
Medicaid	−1119.4
	(583.4)
ARHOME	−1118.1
	(577.8)
Age (yr)	28.8
	(18.3)
BMI	40.1
	(15.8)
Prior Births>0	−852.5
	(334.4)
Prior C-sections>0	137.1
	(256.2)
2×Pop Density	−182.4
	(137.6)
Observations	20087

Back

Demand and Health Results: Patient Outcomes

	Avg ΔPr(Healthy) (%)
Patient Outcomes (1 SD)	−0.200
	(0.244)
ΔEffect of Patient Outcomes (1 SD) per Δx_i:	
Age (yr)	−0.004
	(0.016)
BMI	0.004
	(0.013)
Prior Births>0	0.519
	(0.257)
Prior C-sections>0	0.105
	(0.362)
Observations	20087

Back

Demand and Health Results: Mothers' Characteristics

	Avg ΔPr(Healthy) (%)		Avg ΔPr(Healthy) (%)
Medicaid	0.072	Race (vs. Asian):	
	(0.502)	Black	−0.233
ARHOME	−0.039		(0.876)
	(0.532)	Native American	1.588
Age (yr)	−0.028		(1.341)
	(0.032)	Pacific Islander	0.529
BMI	0.001		(0.691)
	(0.016)	Race Unknown	1.551
Prior Births>0	1.727		(0.774)
	(0.346)	White	1.193
Prior C-sections>0	−0.521		(0.818)
	(0.346)	Income Share (%), by % of Poverty Line:	
Diabetes	−2.300	<50%	0.150
	(0.867)		(0.088)
Hypertension	−0.067	50–99%	−0.192
	(0.688)		(0.079)
Smoker	−0.840	100–124%	0.135
	(0.363)		(0.113)
2×Pop Density	−0.096	125–149%	0.108
	(0.127)		(0.109)
		150–184%	0.130
			(0.105)
		185–199%	−0.294
			(0.181)
Observations	20087		

Back

Demand and Health Results: Unobserved Shocks

Preferences	ΔEffect per SD of ν_i^k ($)	Corr(ν_i^k, ϵ_i)
Distance (mi)	−835.1	0.06
	(330.0)	(0.05)
UAMS	7757.9	−0.33
	(3027.0)	(0.18)
NICU	6477.1	−0.04
	(2369.4)	(0.10)
2×Non-OB Beds	2688.0	−0.03
	(912.4)	(0.11)
Patient Reviews (1 SD)	4402.9	−0.01
	(1404.8)	(0.07)
	SD of ξ_j ($)	SD of λ_j (%)
Demand-Based and Health-Based Quality	1880.8	1.04
	(476.8)	(0.24)
Corr(ξ_j, λ_j)		0.62
		(0.37)
Observations	20087	

Back

Demand and Health Estimation Details

- Step 1: using observed choices, estimate demand parameters and hospital-specific fixed effects with MLE (Cuesta & Tebaldi, 2025).
  - Separate each fixed effect by GLS into the component explained by observed characteristics (δ_0^k) and the unobserved component (σ_ξ and ξ_j).
- Step 2: taking demand estimates as given, estimate health parameters with MLE using observed choices and health outcomes, including λ_j as a random effect.
  - SEs are corrected for first-step imprecision by drawing demand parameters from their covariance.
- County-clustered SEs for mother-level variation, model-based SEs for hospital-level variation.

Back

Commercial Price-Setting Model

- Nash-in-Nash bargaining over markups (with relative weight b):
  - **Insurers** value enrollees' expected utility minus expected payments.
  - **Hospital systems** value expected variable profits.
- Marginal cost for insurer m's births at hospital j:

$$\text{MC}_{mj} = \boldsymbol{\psi}' \mathbf{w}_{mj} + e_{mj}, \quad e_{mj} \sim \text{N}\left(0, \sigma_e^2\right) \tag{18}$$

- Estimate with GMM. For intuition,
  - $\boldsymbol{\psi}$: how price varies with $\mathbf{w}_{mj}$.
  - b: how price varies with willingness to pay.

Back Details Systems

Commercial Price-Setting Results

- Commercial births:
  - Average marginal cost: $4,790
  - Average markup: $3,614
- Medicaid births:
  - Average marginal cost: $1,215
  - Average markup: $1,782

Back Medicaid

	Marginal Cost ($1k)
Constant	5.355
	(1.523)
UAMS	0.921
	(0.426)
NICU	0.115
	(0.592)
2×Non-OB Beds	−0.261
	(0.452)
For-Profit	−1.168
	(1.492)
Wage Index (1 SD)	1.775
	(1.130)
ARHOME	−1.267
	(0.414)
Insurers' Relative Bargaining Weight	0.613
	(0.169)
SD of Marginal Cost Shock	1.976
	(0.329)
Observations	1376

Commercial Price-Setting Model Details I

- Insurer's value:

$$V_m = \frac{1}{\alpha} \sum_{i \in I_m} \text{EU}_i - \sum_{i \in I_m} \sum_{j \in J_m^{\text{OB}}} \left[\Pr\left(i \text{ chooses } j\right) \left(r_i p_{mj} - \text{OOP}_{ij} \right) \right] \tag{19}$$

- Nash-in-Nash bargaining objective for insurer m and system s, where $\text{Markup}_{ms} = p_{mj} - \text{MC}_{mj}$ for all $j \in J_s^{\text{OB}}$:

$$\left[V_m\left(J_m^{\text{OB}}\right) - V_m\left(J_m^{\text{OB}} \setminus J_s^{\text{OB}}\right) \right]^b \left[\sum_{i \in I_m} \sum_{j \in J_s^{\text{OB}}} \left[\Pr\left(i \text{ chooses } j\right) r_i \right] \text{Markup}_{ms} \right]^{1-b} \tag{20}$$

Back

Commercial Price-Setting Model Details II

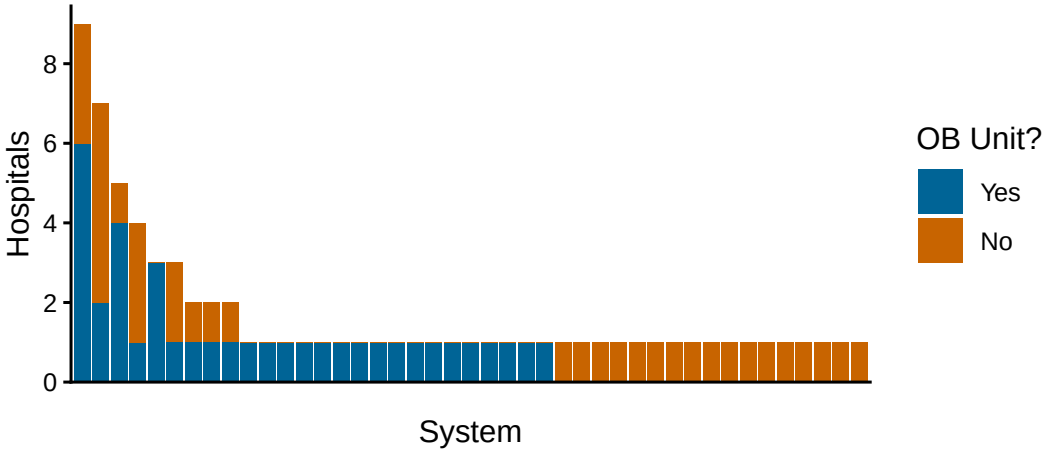
- Moments:

$$\mathrm{E}\left[e_{mj}\widetilde{\mathbf{w}}_{mj}\right] = 0 \tag{21}$$

- Instruments $\widetilde{\mathbf{w}}_{mj}$:
  - $\mathbf{w}_{mj}$
  - Average willingness to pay for hospital j's system among insurer m's enrollees (if all prices were equal to the average observed price).
- $\mathbf{w}_{mj} = 1$, UAMS, NICU, ln(non-OB beds), for-profit, CMS Wage Index, ARHOME.
- SEs are clustered by insurer and system, taking demand estimates as given.

Back

Most Hospital Systems Are Singletons



Back

Medicaid Prices and Marginal Costs

- Medicaid prices are observed and taken as exogenous.
- Medicaid marginal cost at hospital j:

$$\text{MC}_{\text{Medicaid},j} = \boldsymbol{\psi}' \mathbf{w}_{\text{ARHOME},j} - \psi^{\text{Medicaid}} \tag{22}$$

- $\psi^{\text{Medicaid}} = \$2,238$: supplemental payments per Medicaid inpatient day, multiplied by the average number of inpatient days per birth.
- Outside option: price and marginal cost equal to the insurer-level averages.

Back

OB Provision Model

- Hospital j operates an OB unit if its effect on its system's expected variable profit exceeds its fixed cost:

$$\text{Prov}_j = \mathbb{1}\left(\Delta_j \pi_{s(j)}\left(\mathbf{Prov}_{-j}\right) > \text{FC}_j\right) \tag{23}$$

- Fixed cost for hospital j:

$$\text{FC}_j = \overline{\text{FC}} + u_j, \quad \text{E}\left[u_j\right] = 0 \tag{24}$$

- Estimate by constructing revealed-preference bounds on fixed costs.
  - For intuition, $\overline{\text{FC}}$ is set-identified by how OB provision varies with expected variable profit.

Back Details Dynamics

OB Provision Results

	Expected Fixed Cost ($1m)	
Instrument Bins	Estimated Set	95% CI
1 (No Instrument)	[0.290, 9.334]	[0.181, 11.122]
8	[0.336, 3.624]	[0.057, 4.390]
9	[0.355, 3.330]	[0.115, 4.023]
10 (Main)	[0.346, 2.214]	[0.001, 2.602]
11	[0.401, 2.818]	[−0.071, 3.366]
12	[0.234, 4.305]	[−0.011, 5.520]
Observations	71	

Back

OB Provision Model Details I

- Pure-strategy subgame perfect equilibrium.
- Assume (Eizenberg, 2014)

$$\text{FC}_j \in \left[\inf_{j' \in J} \Delta_{j'} \pi_{s(j')} \left(\mathbf{Prov}_{-j'} \right), \sup_{j' \in J} \Delta_{j'} \pi_{s(j')} \left(\mathbf{Prov}_{-j'} \right) \right] \quad \text{for all hospitals } j \tag{25}$$

- These imply lower and upper bounds on FC_j:

$$L_j = \begin{cases} \inf_{j' \in J} \Delta_{j'} \pi_{s(j')} \left(\mathbf{Prov}_{-j'} \right) & \text{if } \text{Prov}_j = 1 \\ \Delta_j \pi_{s(j)} \left(\mathbf{Prov}_{-j} \right) & \text{if } \text{Prov}_j = 0 \end{cases} \tag{26}$$

$$U_j = \begin{cases} \Delta_j \pi_{s(j)} \left(\mathbf{Prov}_{-j} \right) & \text{if } \text{Prov}_j = 1 \\ \sup_{j' \in J} \Delta_{j'} \pi_{s(j')} \left(\mathbf{Prov}_{-j'} \right) & \text{if } \text{Prov}_j = 0 \end{cases} \tag{27}$$

Back

OB Provision Model Details II

- Moment inequalities:

$$\overline{\text{FC}} \geq \text{E}\left[L_j \mid \tilde{\mathbf{y}}_j\right] \tag{28}$$

$$\overline{\text{FC}} \leq \text{E}\left[U_j \mid \tilde{\mathbf{y}}_j\right] \tag{29}$$

- Instrument $\tilde{\mathbf{y}}_j$: expected total intensity-weighted quantity if all hospitals operated OB units and all prices were equal to the average observed price, discretized into 10 equal-sized bins.
- Correct for the bias of a sample minimum and maximum (Hall & Park, 2002).
- Estimation and inference following Chernozhukov et al. (2013). System-clustered CIs.

Back

Dynamic Model of OB Provision

- A dynamic model would differ in two ways: one-time sunk costs of opening an OB unit, and forward-looking hospitals.

- Equivalent to a static model under two assumptions:
  - The profitability of OB provision is declining steadily.
  - It has been declining for a long time.

- Between 1995 and 2024, there were 24 closures of OB units and zero openings of OB units in existing hospitals.

Back

Measuring the Effects of OB Provision

- For each of the 37 OB hospitals, simulate equilibrium outcomes if it did not operate an OB unit, holding fixed the OB provision of all other hospitals.
- **Private surplus**: expected variable profit generated for its system.
- **Variable social surplus**:
  - Access to care: mothers' demand-based welfare before out-of-pocket spending.
  - Expected variable cost savings.
  - Maternal and infant health: $72,845 per adverse-outcome birth (Waitzman et al., 2021).
- **Net externality**: variable social surplus minus private surplus.

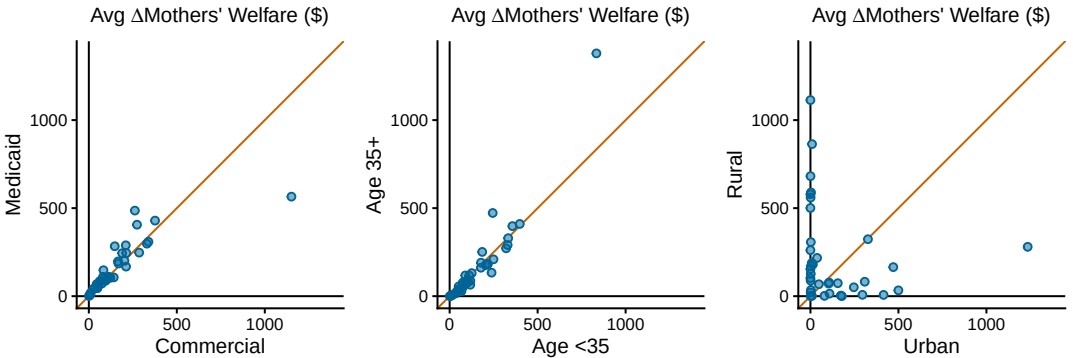
Back Value of Health

Non-Fatal Adverse Outcomes and Infant Death

	Avg ΔPr(No Adverse Outcome) (%)		
	Any	Non-Fatal	Infant Death
Distance to Nearest Option (mi)	0.013	0.010	0.007
	(0.019)	(0.016)	(0.009)
Nearest-Option Effects (ϕ_j and ϕ_j^{nonfatal})			
Standard Deviation Across Hospitals	0.566	0.673	
	(0.218)	(0.177)	
Nearest Option's ϕ_j^{nonfatal}			−0.162
			(0.140)
Corr($\phi_j, \phi_j^{\text{nonfatal}}$)	0.883		
Observations	19843		

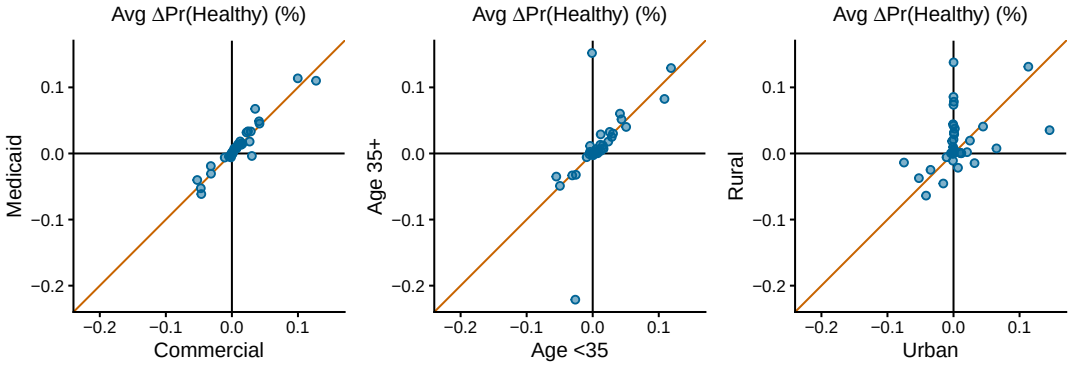
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Heterogeneity in Effects Between Types of Mothers I



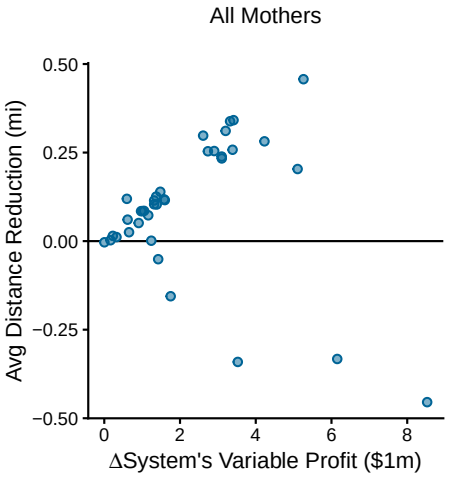
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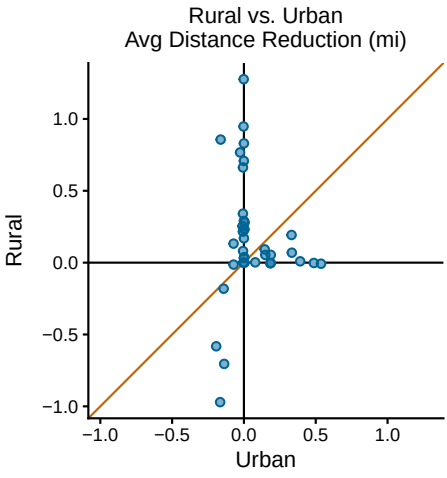
Heterogeneity in Effects Between Types of Mothers II



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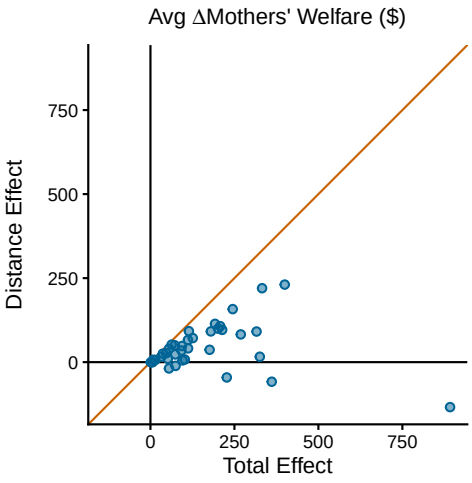
Distance Effects of OB Provision

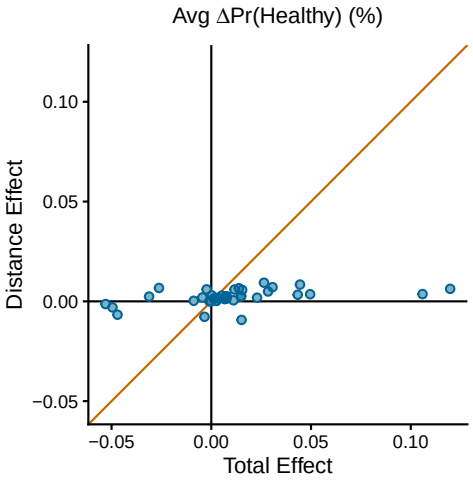




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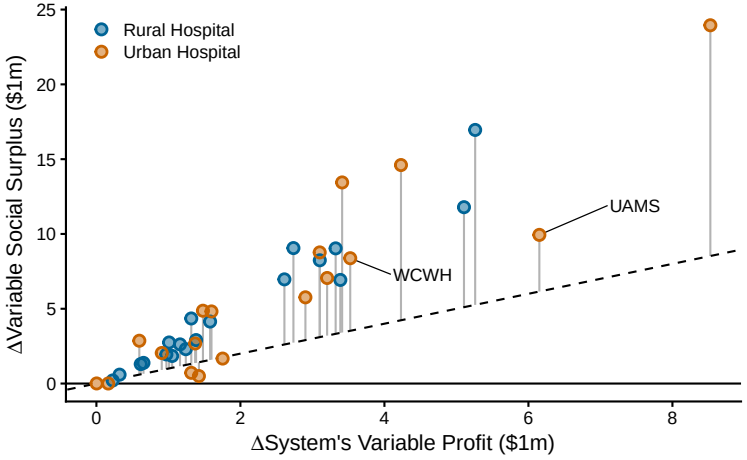
Separating Distance Effect From Total Effect





Back

Net Externality of OB Provision, Rural and Urban Hospitals



Back

Policy Evaluation

- Baseline scenarios: $100,000, $200,000, and $300,000 increases in all fixed costs.
- The 37 OB hospitals may close their OB units. No openings.
- Social welfare: mothers' demand-based welfare, value of maternal and infant health, variable cost, fixed cost.
- Marginal value of public funds: $1 + \Delta\text{Welfare}/\Delta\text{Public Spending}$
- Report the range of predicted outcomes across the estimated set of expected fixed cost.

Back Details Predicted Closures

Policy Evaluation Details

- Choose a value of $\overline{FC}$ from the estimated set.
- Draw fixed cost shocks **u** from a uniform distribution over the set that satisfies two conditions:
  - Observed OB provision is rationalized: $FC_j \in [L_j, U_j]$ for all hospitals j.
  - Instrument exogeneity is empirically satisfied.
- For each draw, solve for an equilibrium configuration of OB provision:
  - Start from the status quo. The system with the highest gain from deviating changes its configuration, one system at a time, until there are no more profitable deviations.
  - Converges in 99.8% of simulations.
- Average over draws, and repeat for all values of $\overline{FC}$ in the estimated set.

Back

The Model Predicts Actual OB Unit Closures

	OB Closures (%)		
	OB Closures (Out of 37)	Hospitals With Actual Closures in 2023–2024 (Out of 4)	Others (Out of 33)
$100k Fixed Cost Increase	[2.1, 6.2]	[31.4, 36.0]	[2.2, 14.9]
$200k Fixed Cost Increase	[3.3, 7.8]	[41.6, 46.7]	[4.6, 18.7]
$300k Fixed Cost Increase	[4.5, 9.7]	[54.1, 57.4]	[6.7, 22.7]

- 4 hospitals closed their OB units in 2023–2024: in the middle of the range under a $100,000 increase.
- Out-of-sample check: actual OB unit closures are not used in estimation.

Back

Medicaid Price Hike: Full Results

	OB Closures (Out of 37)	ΔSocial Welfare ($1m)	ΔPublic Spending ($1m)	MVPF
$100k Fixed Cost Increase	[2.1, 6.2]	–	–	–
+ Medicaid Price +35%	[1.3, 1.5]	[+0.8, +11.5]	[+14.5, +14.6]	[1.06, 1.79]
+ Medicaid Price +70%	1	[+0.8, +11.6]	[+29.0, +29.1]	[1.03, 1.40]
$200k Fixed Cost Increase	[3.3, 7.8]	–	–	–
+ Medicaid Price +35%	[2.3, 5.6]	[+1.4, +8.5]	[+14.5, +14.6]	[1.09, 1.58]
+ Medicaid Price +70%	[1.7, 1.9]	[+1.7, +13.3]	[+29.0, +29.1]	[1.06, 1.46]
$300k Fixed Cost Increase	[4.5, 9.7]	–	–	–
+ Medicaid Price +35%	[3.4, 7.5]	[+1.9, +7.5]	+14.5	[1.13, 1.51]
+ Medicaid Price +70%	[2.6, 3.7]	[+2.7, +15.7]	[+29.0, +29.2]	[1.09, 1.54]

Back

Medicaid Price Hike: Welfare Components

	ΔMothers' Welfare ($1m)	ΔValue of Healthy Births ($1m)	Variable Cost Savings ($1m)	Fixed Cost Savings ($1m)
$100k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+1.2, +18.2]	[+0.1, +0.8]	[+0.002, +1.3]	[−8.8, −0.5]
+ Medicaid Price +70%	[+1.4, +18.4]	[+0.1, +0.8]	[−0.03, +1.3]	[−8.9, −0.6]
$200k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+2.0, +12.8]	[+0.1, +0.6]	[−2.4, +0.7]	[−5.6, −0.8]
+ Medicaid Price +70%	[+2.5, +22.3]	[+0.1, +0.8]	[−0.005, +0.9]	[−10.2, −0.9]
$300k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+2.7, +11.7]	[+0.1, +0.7]	[−1.0, +0.2]	[−4.9, −1.0]
+ Medicaid Price +70%	[+3.8, +24.0]	[+0.2, +1.3]	[+0.1, +1.0]	[−10.3, −1.4]

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Medicaid Price Hike: Medicaid and Commercial Mothers

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Medicaid	Commercial	Medicaid	Commercial
$100k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+42, +584]	[+35, +545]	[+0.004, +0.041]	[+0.003, +0.030]
+ Medicaid Price +70%	[+46, +591]	[+39, +551]	[+0.005, +0.042]	[+0.003, +0.030]
$200k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+70, +434]	[+58, +364]	[+0.005, +0.033]	[+0.001, +0.021]
+ Medicaid Price +70%	[+84, +745]	[+71, +649]	[+0.007, +0.042]	[+0.005, +0.029]
$300k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+92, +395]	[+79, +338]	[+0.007, +0.039]	[+0.005, +0.025]
+ Medicaid Price +70%	[+129, +846]	[+109, +664]	[+0.011, +0.069]	[+0.008, +0.045]

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Medicaid Price Hike: Older and Younger Mothers

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Age 35+	Age <35	Age 35+	Age <35
$100k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+30, +476]	[+39, +573]	[+0.002, +0.022]	[+0.004, +0.036]
+ Medicaid Price +70%	[+32, +480]	[+43, +579]	[+0.003, +0.022]	[+0.004, +0.037]
$200k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+51, +344]	[+65, +401]	[+0.003, +0.021]	[+0.004, +0.027]
+ Medicaid Price +70%	[+59, +599]	[+79, +702]	[+0.004, +0.025]	[+0.006, +0.036]
$300k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+72, +330]	[+86, +367]	[+0.004, +0.032]	[+0.006, +0.031]
+ Medicaid Price +70%	[+95, +663]	[+120, +754]	[+0.006, +0.043]	[+0.010, +0.057]

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Medicaid Price Hike: Rural and Urban Mothers

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Rural	Urban	Rural	Urban
$100k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+55, +1107]	[+29, +257]	[+0.007, +0.086]	[+0.002, +0.006]
+ Medicaid Price +70%	[+62, +1121]	[+30, +259]	[+0.008, +0.088]	[+0.001, +0.006]
$200k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+87, +727]	[+50, +209]	[+0.009, +0.066]	[−0.008, +0.008]
+ Medicaid Price +70%	[+110, +1325]	[+58, +336]	[+0.013, +0.092]	[+0.002, +0.009]
$300k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+108, +588]	[+71, +238]	[+0.011, +0.075]	[+0.003, +0.011]
+ Medicaid Price +70%	[+165, +1560]	[+91, +327]	[+0.019, +0.155]	[−0.0001, +0.012]

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Medicaid Price Hike: Distance Effects

	Avg Distance Reduction (mi)		
	All Mothers	Rural	Urban
$100k Fixed Cost Increase	–	–	–
+ Medicaid Price +35%	[+0.04, +0.53]	[+0.06, +1.22]	[+0.03, +0.15]
+ Medicaid Price +70%	[+0.04, +0.54]	[+0.07, +1.24]	[+0.03, +0.15]
$200k Fixed Cost Increase	–	–	–
+ Medicaid Price +35%	[+0.06, +0.38]	[+0.09, +0.80]	[+0.04, +0.14]
+ Medicaid Price +70%	[+0.08, +0.64]	[+0.12, +1.41]	[+0.05, +0.20]
$300k Fixed Cost Increase	–	–	–
+ Medicaid Price +35%	[+0.08, +0.33]	[+0.12, +0.62]	[+0.06, +0.19]
+ Medicaid Price +70%	[+0.12, +0.73]	[+0.19, +1.73]	[+0.08, +0.23]

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Medicaid Price Hike: Distance Effect and Total Effect

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Total Effect	Distance Effect	Total Effect	Distance Effect
$100k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+38, +562]	[+19, +262]	[+0.003, +0.035]	[+0.001, +0.012]
+ Medicaid Price +70%	[+42, +569]	[+21, +265]	[+0.004, +0.035]	[+0.001, +0.012]
$200k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+63, +395]	[+27, +175]	[+0.004, +0.027]	[+0.001, +0.008]
+ Medicaid Price +70%	[+77, +691]	[+38, +283]	[+0.006, +0.035]	[+0.002, +0.015]
$300k Fixed Cost Increase	–	–	–	–
+ Medicaid Price +35%	[+84, +364]	[+39, +143]	[+0.006, +0.031]	[+0.002, +0.007]
+ Medicaid Price +70%	[+118, +744]	[+59, +291]	[+0.009, +0.056]	[+0.003, +0.016]

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Medicaid Price Hike: Rural and Urban Hospitals

	OB Closures	
	Rural Hospitals (Out of 19)	Urban Hospitals (Out of 18)
$100k Fixed Cost Increase	[0.6, 3.6]	[1.5, 2.5]
+ Medicaid Price +35%	[0.2, 0.3]	[1.1, 1.2]
+ Medicaid Price +70%	0	1
$200k Fixed Cost Increase	[1.2, 4.5]	[2.1, 3.3]
+ Medicaid Price +35%	[0.7, 3.1]	[1.6, 2.5]
+ Medicaid Price +70%	[0.3, 0.5]	[1.3, 1.4]
$300k Fixed Cost Increase	[2.0, 5.5]	[2.5, 4.2]
+ Medicaid Price +35%	[1.3, 4.6]	[2.1, 2.9]
+ Medicaid Price +70%	[0.8, 1.3]	[1.8, 2.4]

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OB Unit Subsidy: Full Results

	OB Closures (Out of 37)	ΔSocial Welfare ($1m)	ΔPublic Spending ($1m)	MVPF
$100k Fixed Cost Increase	[2.1, 6.2]	–	–	–
+ OB Subsidy $100k	0	[+0.9, +11.6]	+3.7	[1.24, 4.17]
$200k Fixed Cost Increase	[3.3, 7.8]	–	–	–
+ OB Subsidy $100k	[2.1, 6.2]	[+0.9, +4.2]	[+3.1, +3.5]	[1.26, 2.25]
+ OB Subsidy $200k	0	[+1.8, +13.5]	[+7.4, +7.5]	[1.24, 2.83]
$300k Fixed Cost Increase	[4.5, 9.7]	–	–	–
+ OB Subsidy $100k	[3.3, 7.8]	[+1.3, +5.5]	[+3.0, +3.4]	[1.39, 2.84]
+ OB Subsidy $200k	[2.1, 6.2]	[+2.2, +7.8]	[+6.3, +7.0]	[1.31, 2.18]
+ OB Subsidy $300k	0	[+3.1, +19.1]	[+11.1, +11.2]	[1.28, 2.70]

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OB Unit Subsidy: Welfare Components

	ΔMothers' Welfare ($1m)	ΔValue of Healthy Births ($1m)	Variable Cost Savings ($1m)	Fixed Cost Savings ($1m)
$100k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+1.4, +18.4]	[+0.1, +0.8]	[−0.04, +1.2]	[−8.9, −0.5]
$200k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+1.4, +6.2]	[+0.01, +0.3]	[−0.9, +0.2]	[−2.6, −0.5]
+ OB Subsidy $200k	[+2.8, +22.7]	[+0.2, +0.8]	[−0.1, +0.8]	[−10.4, −1.0]
$300k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+1.7, +5.2]	[+0.1, +0.7]	[−0.02, +0.9]	[−2.0, −0.5]
+ OB Subsidy $200k	[+3.1, +11.5]	[+0.2, +0.7]	[−0.1, +0.3]	[−4.6, −1.0]
+ OB Subsidy $300k	[+4.5, +27.9]	[+0.3, +1.5]	[−0.1, +1.2]	[−11.6, −1.6]

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OB Unit Subsidy: Medicaid and Commercial Mothers

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Medicaid	Commercial	Medicaid	Commercial
$100k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+47, +592]	[+39, +551]	[+0.004, +0.041]	[+0.003, +0.030]
$200k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+47, +212]	[+39, +179]	[+0.002, +0.017]	[−0.001, +0.011]
+ OB Subsidy $200k	[+94, +759]	[+78, +660]	[+0.008, +0.043]	[+0.005, +0.029]
$300k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+59, +205]	[+49, +151]	[+0.006, +0.038]	[+0.005, +0.024]
+ OB Subsidy $200k	[+106, +386]	[+89, +330]	[+0.010, +0.039]	[+0.007, +0.023]
+ OB Subsidy $300k	[+153, +964]	[+128, +783]	[+0.014, +0.081]	[+0.010, +0.053]

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OB Unit Subsidy: Older and Younger Mothers

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Age 35+	Age <35	Age 35+	Age <35
$100k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+32, +480]	[+44, +580]	[+0.002, +0.022]	[+0.004, +0.036]
$200k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+31, +164]	[+44, +197]	[+0.001, +0.010]	[−0.00001, +0.014]
+ OB Subsidy $200k	[+63, +605]	[+88, +715]	[+0.004, +0.026]	[+0.007, +0.036]
$300k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+42, +142]	[+55, +164]	[+0.003, +0.023]	[+0.006, +0.031]
+ OB Subsidy $200k	[+73, +302]	[+99, +361]	[+0.005, +0.027]	[+0.009, +0.031]
+ OB Subsidy $300k	[+105, +748]	[+143, +877]	[+0.007, +0.049]	[+0.012, +0.067]

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OB Unit Subsidy: Rural and Urban Mothers

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Rural	Urban	Rural	Urban
$100k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+62, +1121]	[+32, +261]	[+0.008, +0.088]	[+0.001, +0.005]
$200k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+63, +350]	[+31, +106]	[+0.007, +0.033]	[−0.003, +0.003]
+ OB Subsidy $200k	[+125, +1350]	[+63, +342]	[+0.016, +0.095]	[+0.001, +0.008]
$300k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+81, +301]	[+38, +92]	[+0.011, +0.073]	[+0.002, +0.006]
+ OB Subsidy $200k	[+144, +635]	[+69, +198]	[+0.019, +0.080]	[+0.002, +0.008]
+ OB Subsidy $300k	[+207, +1651]	[+101, +422]	[+0.027, +0.168]	[+0.003, +0.012]

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OB Unit Subsidy: Distance Effects

	Avg Distance Reduction (mi)		
	All Mothers	Rural	Urban
$100k Fixed Cost Increase	–	–	–
+ OB Subsidy $100k	[+0.04, +0.54]	[+0.07, +1.24]	[+0.02, +0.14]
$200k Fixed Cost Increase	–	–	–
+ OB Subsidy $100k	[+0.04, +0.19]	[+0.07, +0.39]	[+0.02, +0.07]
+ OB Subsidy $200k	[+0.08, +0.65]	[+0.14, +1.45]	[+0.04, +0.20]
$300k Fixed Cost Increase	–	–	–
+ OB Subsidy $100k	[+0.06, +0.21]	[+0.10, +0.40]	[+0.03, +0.10]
+ OB Subsidy $200k	[+0.10, +0.34]	[+0.17, +0.71]	[+0.06, +0.16]
+ OB Subsidy $300k	[+0.14, +0.85]	[+0.24, +1.85]	[+0.08, +0.30]

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OB Unit Subsidy: Distance Effect and Total Effect

	Avg ΔMothers' Welfare ($)		Avg ΔPr(Healthy) (%)	
	Total Effect	Distance Effect	Total Effect	Distance Effect
$100k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+43, +569]	[+21, +264]	[+0.004, +0.035]	[+0.001, +0.012]
$200k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+43, +193]	[+20, +86]	[+0.0004, +0.014]	[+0.001, +0.004]
+ OB Subsidy $200k	[+85, +704]	[+41, +287]	[+0.007, +0.035]	[+0.002, +0.015]
$300k Fixed Cost Increase	–	–	–	–
+ OB Subsidy $100k	[+54, +161]	[+27, +86]	[+0.005, +0.030]	[+0.001, +0.004]
+ OB Subsidy $200k	[+96, +355]	[+47, +153]	[+0.008, +0.030]	[+0.002, +0.008]
+ OB Subsidy $300k	[+139, +863]	[+68, +374]	[+0.012, +0.065]	[+0.003, +0.019]

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OB Unit Subsidy: Rural and Urban Hospitals

	OB Closures	
	Rural Hospitals (Out of 19)	Urban Hospitals (Out of 18)
$100k Fixed Cost Increase	[0.6, 3.6]	[1.5, 2.5]
+ OB Subsidy $100k	0	0
$200k Fixed Cost Increase	[1.2, 4.5]	[2.1, 3.3]
+ OB Subsidy $100k	[0.6, 3.6]	[1.5, 2.5]
+ OB Subsidy $200k	0	0
$300k Fixed Cost Increase	[2.0, 5.5]	[2.5, 4.2]
+ OB Subsidy $100k	[1.2, 4.5]	[2.1, 3.3]
+ OB Subsidy $200k	[0.6, 3.6]	[1.5, 2.5]
+ OB Subsidy $300k	0	0

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