The Impact of Public Health Insurance on Medical Utilization in a Vulnerable Population: Evidence from COFA Migrants

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Some Background

- How does insurance coverage impact medical demand?
- Poor are often most in need of healthcare.
- W/O coverage, this population might forgo care.
- Primary motivation for expansion of coverage.
- Evidence that more coverage $\Rightarrow$ more consumption.
  - RAND HIE (Newhouse, et al. 1993; Aron-Dine et al (2013)
  - Oregon HIE (Finkelstein, et al, 2012)
  - Medicare (Card, et al. 2008)
  - Expiration of Medicaid benefits in TennCare (DeLeire 2018)
  - Mixed impacts on health*
- Little evidence in vulnerable migrant populations.

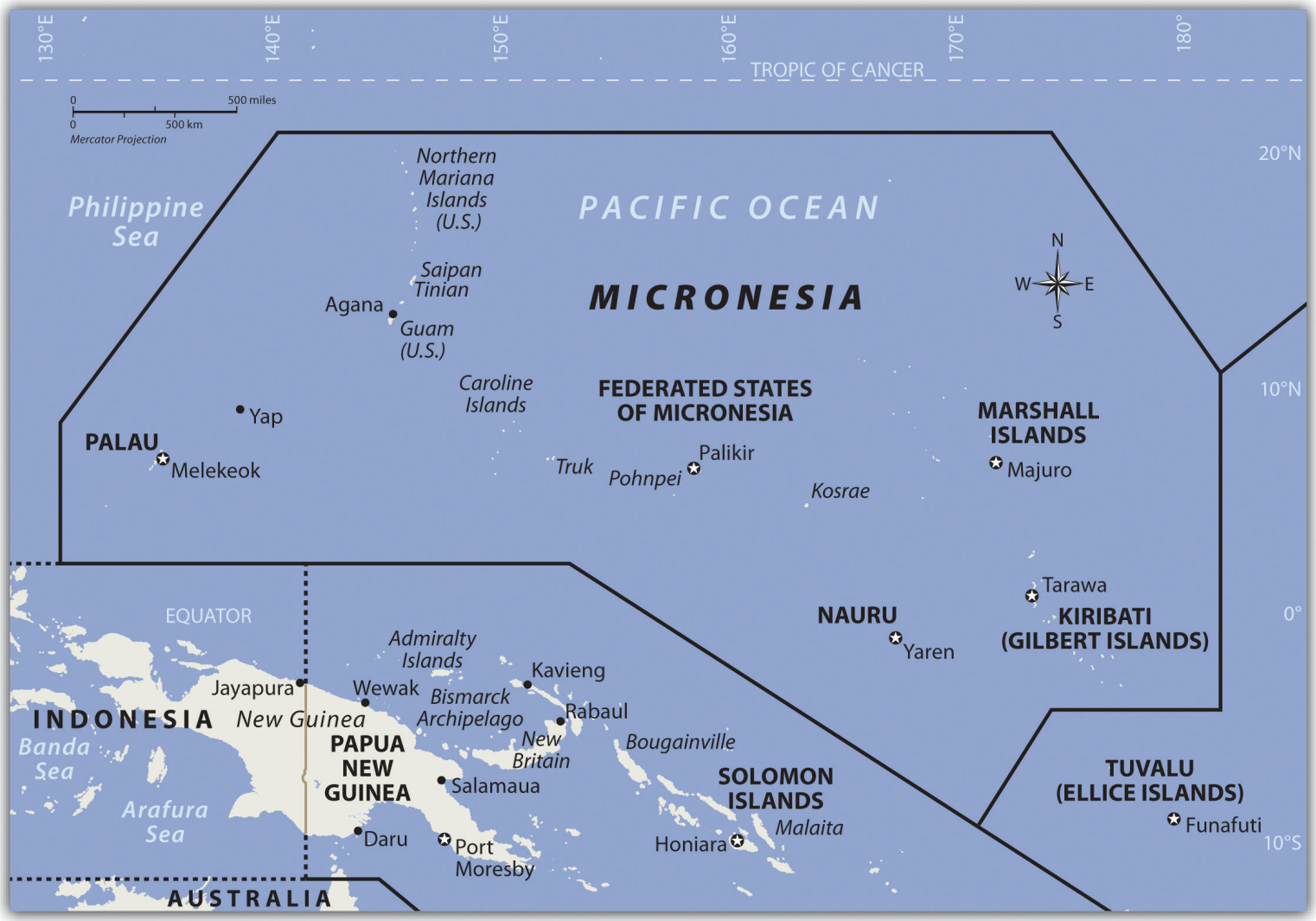
Our Setting

- Medicaid coverage was reduced in Hawaii.
  - Due to a change in administrative rules.
  - Among Compact of Free Association (COFA) migrants.
- Examine loss of Medicaid for COFA migrants.
- COFA migrants are drawn primarily from:
  - Republic of Palau,
  - Republic of the Marshall Islands,
  - Federated States of Micronesia.
  - Located in the middle and western Pacific Ocean.
- Ineligible for federal Medicaid assistance in 1996.
  - COFA migrants classified as “non-qualified aliens.”
- State-funded programs persisted for years afterwards.
- Hawaii elected to suspend benefits to COFA migrants.
- Challenged but upheld in court.
- COFA migrants lost Medicaid coverage in March 2015.

Our Setting

- Medicaid expired on March 2015 for COFA migrants.
  - Except for:
    - Aged, blind, disabled (ABD),
    - Pregnant mothers,
    - Resident children via CHIPRA.
- Rest told to buy insurance on Hawaii Health Connector.
- Premium assistance was available $<$ 100% FPL.
  - Practical difficulties with implementation.
    - Forms in English.
    - Required proper filing of 1095A.
- There were OOP expenses (in contrast to Medicaid).
- Further complication.
  - Connector shut down in 2015.
  - Replaced by healthcare.gov.
  - Not accessible in COFA languages.

Map of COFA Nations



This Paper

- Employ hospital data on in-patient and ER admissions.
- Construct 24 month individual panel spanning 2014-15.
- Utilize three ethnic groups:
  - COFA migrants (treatment),
  - Caucasian (control),
  - Japanese (placebo).
- Estimate difference-in-difference models.
- Among COFA migrants, we show:
  - Decline in Medicaid-funded utilizations,
  - Increase in privately funded utilizations,
  - But on net utilization declined.
  - Consistent with downward sloping demand.
  - Hospitalization of infants increased sharply.
  - Suggestive of some harms.

Research Question

How did expiration of Medicaid benefits impact the demand for emergency and in-patient medical services among COFA migrants?

Data

HHIC

- Data come from Hawaii Health Information Corporation.
- HHIC is a private non-profit organization in Honolulu.
  - Collects data from hospitals in Hawaii.
  - Maintains a large database.
- Not insurance claims data.
- Only contains ER and in-patient utilization.

Data

Screenshot of Raw Data

	DIS_TYPE	mpi	DIS_DATE	ses	race	gender	age	PAYER_TYPE	TOT_CHRG
1	Inpatient	1001125900	14 Sep 15	Maui W and C	White\Caucasian	[redacted]		Medicare	[redacted]
2	Inpatient	1000930994	28 Mar 14	Hawaii N	White\Caucasian			Dept of Defense	
3	Inpatient	1000708800	18 Jun 14	Maui W and C	White\Caucasian			Medicare	
4	Inpatient	1000104092	05 Jun 14	Oahu Kailua - Kane	White\Caucasian			Private Insurance	
5	Inpatient	1000008079	02 Dec 15	Maui E	Japanese			Medicare	
6	Inpatient	1000070812	17 Jul 14	Maui E	White\Caucasian			Medicare	
7	Inpatient	1000524344	02 Jan 14	Oahu C Honolulu	Japanese			Medicare	
8	Inpatient	1000719261	18 Feb 14	Oahu C Honolulu	White\Caucasian			Medicare	
9	Inpatient	1000171754	04 Mar 14	Oahu Ewa	White\Caucasian			Medicare	
10	Inpatient	1000078752	20 Apr 14	Maui W and C	White\Caucasian			Medicaid/Quest	
11	Inpatient	1000219615	04 Mar 14	Oahu N Shore	White\Caucasian			Dept of Defense	
12	Inpatient	1000050267	30 Aug 14	Oahu Aiea - PC	White\Caucasian			Private Insurance	
13	Inpatient	1000358290	15 Jan 14	Hawaii Kona	White\Caucasian			Private Insurance	
14	Inpatient	1000115002	31 Mar 14	Oahu Ewa	White\Caucasian			Medicare	
15	Inpatient	1001220600	24 Jun 14	Kauai N and W	White\Caucasian			Medicaid/Quest	
16	Inpatient	1000276914	07 Feb 14	Oahu Kailua - Kane	Japanese			Medicare	
17	Inpatient	1000613491	02 Jan 14	Oahu Aiea - PC	Japanese			Medicare	
18	Inpatient	1001265329	21 Feb 14	Oahu Waianae	White\Caucasian			Medicaid/Quest	
19	Inpatient	1001177224	11 Jan 14	Oahu C Honolulu	Japanese			Private Insurance	
20	Inpatient	1000260357	07 Jan 14	Oahu E Honolulu	White\Caucasian			Private Insurance	
21	Inpatient	1000039382	07 Feb 14	Oahu C Honolulu	White\Caucasian			Medicare	
22	Inpatient	1001256479	13 Jan 14	Oahu C Honolulu	White\Caucasian			Medicaid/Quest	
23	Inpatient	1001208209	07 Mar 14	Oahu Ewa	White\Caucasian			Medicare	
24	Inpatient	1000317839	09 May 14	Oahu W Honolulu	Japanese			Medicare	
25	Inpatient	1000076418	15 Jan 14	Hawaii N	White\Caucasian			Private Insurance	
26	Inpatient	1000053480	28 Jan 14	Oahu C Honolulu	White\Caucasian			Medicare	
27	Inpatient	1001292000	03 Mar 14	Maui W and C	White\Caucasian			Self Pay	
28	Inpatient	1000268309	15 Jan 14	Oahu Ewa	Japanese			Medicare	
29	Inpatient	1001024536	04 Jan 14	Maui W and C	Japanese			Medicare	

Data

Some Details

- All utilizations from Jan 1 2014 to Dec 31 2015.
- Exclude people w/o Hawaii addresses.
- 409,556 total utilizations.
- Data contain:
  - Type, date, race, gender, age, payer, charges, ICD9's.
- Critical: synthetic master patient ID.
  - Allows us to track individual utilization over time.
- Construct individual-level panel.
  - Observation is individual/month.
  - Compute total admissions and charges.
  - No reported discharge in a month $\Rightarrow$ zero in panel.
  - Important: catchment area of HHIC is very large.
- Final panel:
  - 205,688 individuals.
  - 4,936,471 individual/months.

Data

Descriptive Statistics from Discharge Data

Race	Counts [Percentage]
Japanese	115,456 [28.2%]
COFA	25,621 [6.3%]
White	268,479 [65.6%]

Data

Descriptive Statistics from Discharge Data

Payer	Counts [Percentage]
D o D	19,132 [4.7%]
Medicaid	114,711 [28.0%]
Medicare	115,907 [28.3%]
Misc	9,886 [2.4%]
Private	132,607 [32.4%]
Self	17,319 [4.2%]

Data

Sampling Issues

- By necessity, we only include individuals:
  - With at least one admission to a hospital or an ER.
  - During 2014-2015.
- $\Rightarrow$ exclude people with no contact (who are zeros).
- Solution:
  - Add “dummy” observation for age/ethnicity category.
  - 24 period string of zeros.
  - Use frequency weights based off of numbers from ACS.
- Ensures denominators are population counts in Hawaii.

Data

Population Counts in the HHIC and ACS Data

	HHIC	ACS	HHIC/ACS
COFA	11,530	33,976	34%
Japanese	63,174	310,595	20%
White	131,510	604,474	22%

Notes: We used the American Community Survey from the years 2011-2015 to compute the population numbers for a given year. The counts from the ACS account for people reporting multiple races.

Data

Descriptive Statistics from Panel Data: 65 and Under

	Any Payer	Medicaid	Private	Uninsured
Inpatient				
- Admissions	0.00320	0.00108	0.00159	0.00008
- Charges	91.92	31.19	41.67	1.58
ER				
- Admissions	0.01378	0.00532	0.00547	0.00088
- Charges	29.90	10.58	12.54	1.87

Notes: All statistics are on a person/month basis. Frequency weights are used to account for missing zeros.

Data

Descriptive Statistics from Panel Data: COFA Migrants, 65 and Under

	Any Payer	Medicaid	Private	Uninsured
Inpatient				
- Admissions	0.00608	0.00505	0.00055	0.00036
- Charges	169.59	139.69	14.71	8.10
ER				
- Admissions	0.02617	0.01918	0.00269	0.00364
- Charges	49.86	34.52	5.94	7.78

Notes: All statistics are on a person/month basis. Frequency weights are used to account for missing zeros. All descriptive statistics correspond to the period prior to March 1, 2015.

COFA migrants (<65) cost about $175 per person/month.

Assuming 32,000 migrants $\Rightarrow$

$67.2 million per year.

B/C $175 person/month $\times$ 12 months $\times$ 32K migrants.

Data

Descriptive Statistics

- For the entire sample:

Inpatient 0.00320 $\Rightarrow$ 1 admission every 26.0 years.[1]
ER 0.01378 $\Rightarrow$ 1 admission every 6.1 years.

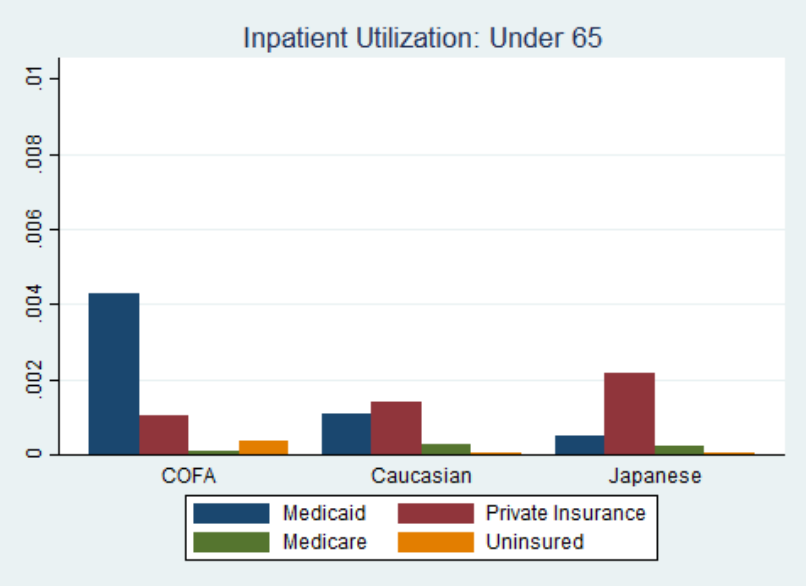
- For the COFA sample:

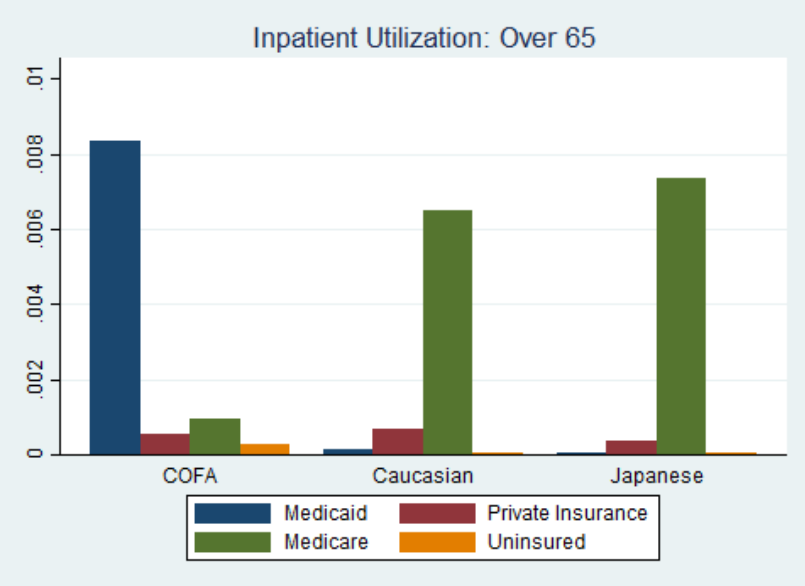
Inpatient 0.00608 $\Rightarrow$ 1 admission every 13.7 years.
ER 0.02617 $\Rightarrow$ 1 admission every 3.2 years.

[1] Excludes normal childbirths.

Data

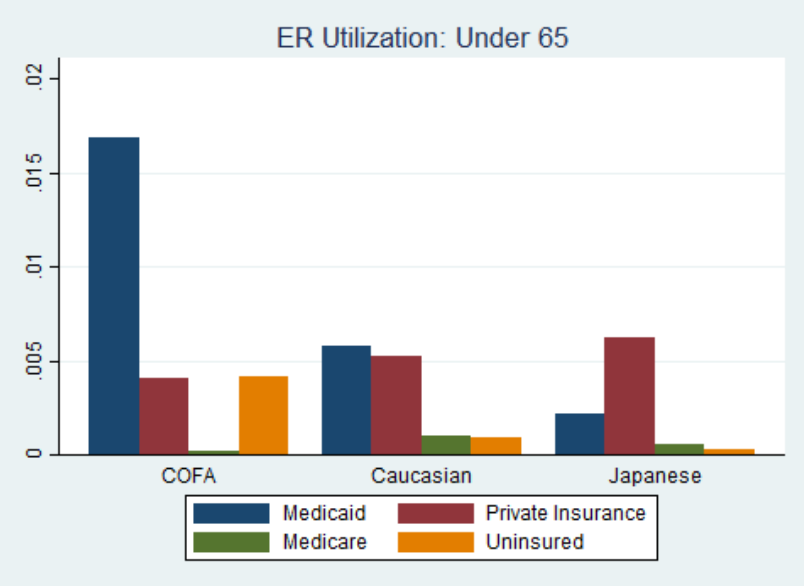
Inpatient Utilization by Race

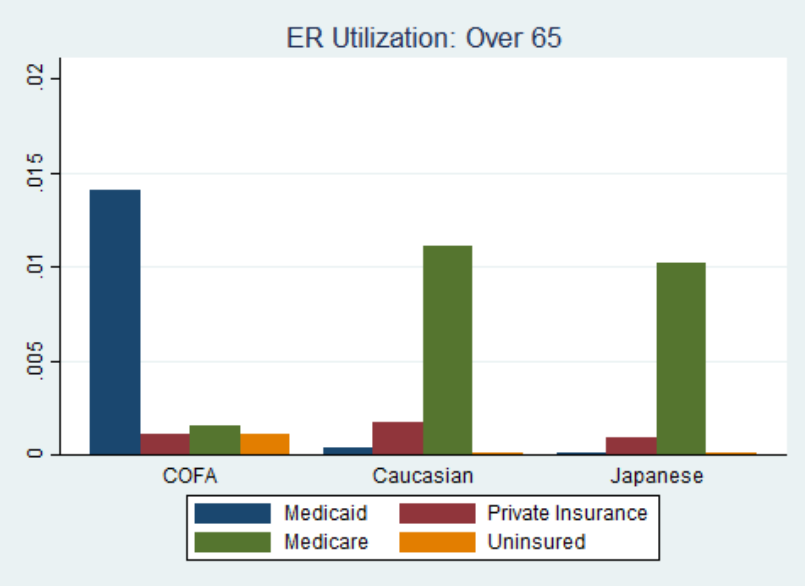




Data

ER Utilization by Race





Methods

Primary Estimation Model

- Primary model is a standard D-in-D:

$$y_{it} = \alpha_i + \theta PT_t + \pi PT_t \times JP_i + \tau PT_t \times COFA_i + g(age_{it}) + \upsilon_{it}$$

  - PT_t is a dummy for post March 2015.
  - $COFA_i$ and JP_i are COFA or Japanese dummies.

- The treatment effect is τ.

- We should observe that the placebo is zero.
  - *i.e.* $\pi = 0$.

- Estimate via within-group estimator.

- SE's clustered by individual.

Methods

Heterogeneous Trends

- For robustness, we also estimate

$$y_{it} = \alpha_i + \rho_i \times t + \theta PT_t + \pi PT_t \times JP_i + \tau PT_t \times COFA_i + \upsilon_{it}$$

  - Allows for different trends across individuals.

- Taking first-differences, we obtain:

$$\Delta y_{it} = \rho_i + \theta \Delta PT_t + \pi \Delta PT_t \times JP_i + \tau \Delta PT_t \times COFA_i + \Delta \upsilon_{it}$$

  - Estimate FD model using WG estimator.
  - Essentially a double difference.
  - This eats data.

Methods

Related Estimations

1. Event analysis.
    - Include set of time dummies.
    - Interaction with $COFA_i$.
    - Another way to test for parallel trends.
2. Heterogeneity by age.
    - Include set of age dummies.
    - Interaction with $COFA_i$.
    - What age groups were most impacted?

Results

Core Estimations: Admissions

	Any	Medicaid	Private
		Inpatient	
Placebo	-0.0002	-0.0001	0.0000
	(0.0001)	(0.0001)	(0.0001)
Treatment	-0.0006*	-0.0019***	0.0013***
	(0.0002)	(0.0002)	(0.0002)
		ER	
Placebo	-0.0002	-0.0002	0.0002*
	(0.0002)	(0.0001)	(0.0001)
Treatment	-0.0019***	-0.0062***	0.0035***
	(0.0005)	(0.0006)	(0.0003)

Results

Core Estimations: Charges

	Any	Medicaid	Private
		Levels	
Placebo	-3.36	-2.47	1.93
	(5.13)	(2.20)	(3.49)
Treatment	1.45	-60.87***	52.35***
	(13.31)	(11.89)	(7.63)
		Logs	
Placebo	-0.00*	-0.00	0.00
	(0.00)	(0.00)	(0.00)
Treatment	-0.02***	-0.06***	0.03***
	(0.00)	(0.01)	(0.00)

Results

Core Estimations: Summary

- Between March - December 2015:

Inpatient Roughly 192 fewer total admissions.
ER Roughly 607 fewer total admissions.

  - Among 31,937 COFA migrants.

Results

Core Estimations: Summary

- By payer:

Medicaid	37% decline in inpatient admissions.
	32% decline in ER admissions.
Private	241% increase in inpatient admissions.
	130% increase in ER admissions.

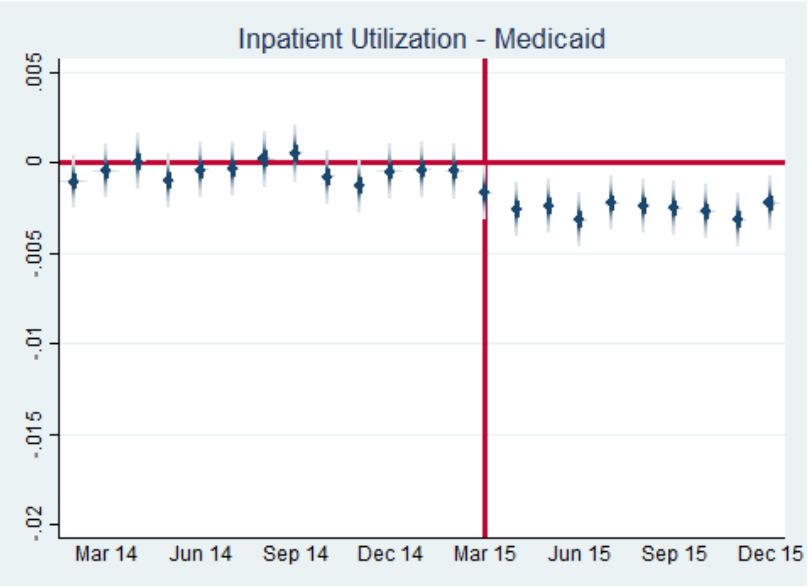
- Little evidence of placebo effects.

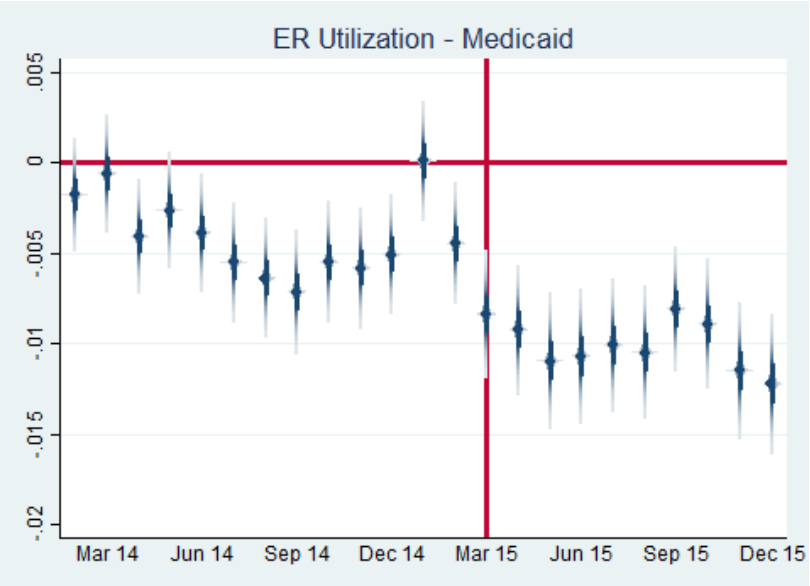
Results

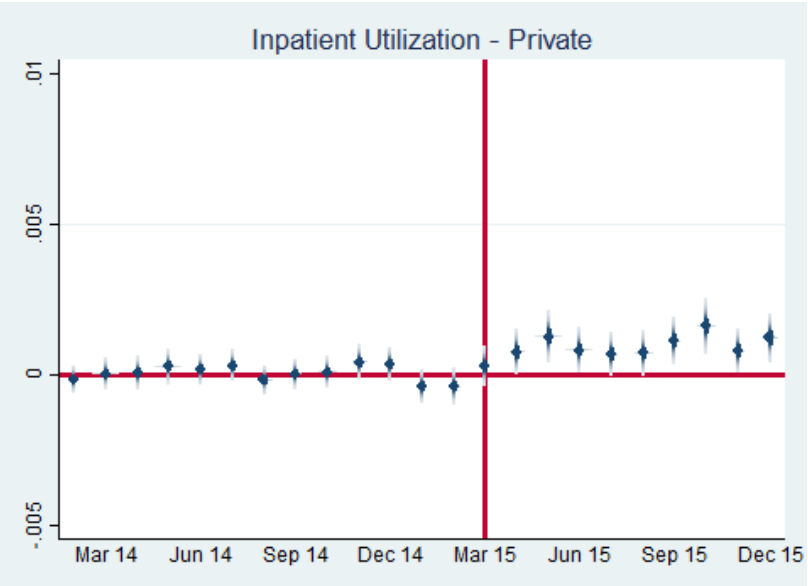
Robustness: Random Trends

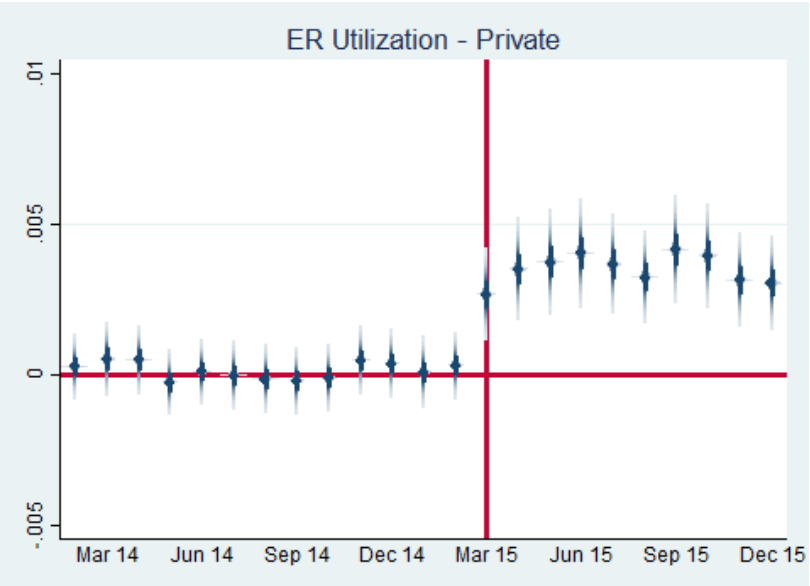
	Any	Medicaid	Private
		Inpatient	
Placebo	-0.0000	-0.0000	0.0001
	(0.0002)	(0.0001)	(0.0002)
Treatment	-0.0003	-0.0011*	0.0007*
	(0.0007)	(0.0006)	(0.0003)
		ER	
Placebo	-0.0004	-0.0003	-0.0001
	(0.0005)	(0.0003)	(0.0003)
Treatment	-0.0000	-0.0034**	0.0023***
	(0.0015)	(0.0012)	(0.0006)

Event Analysis

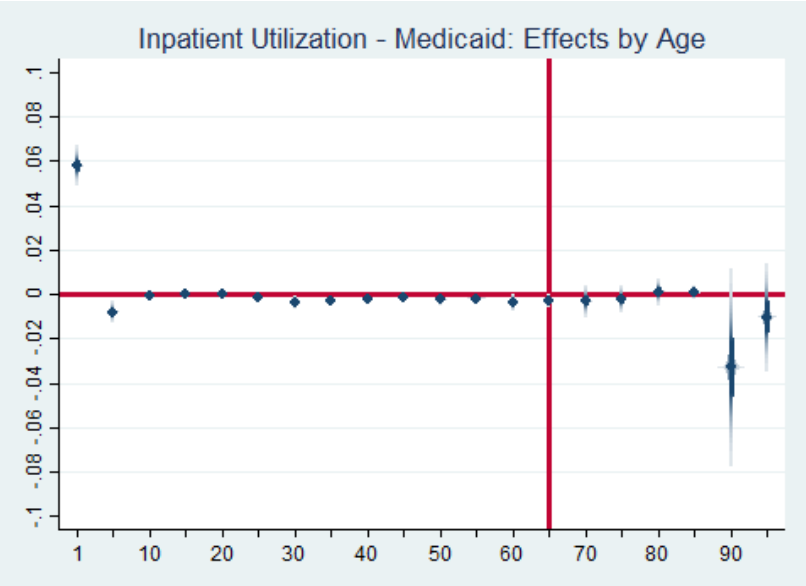


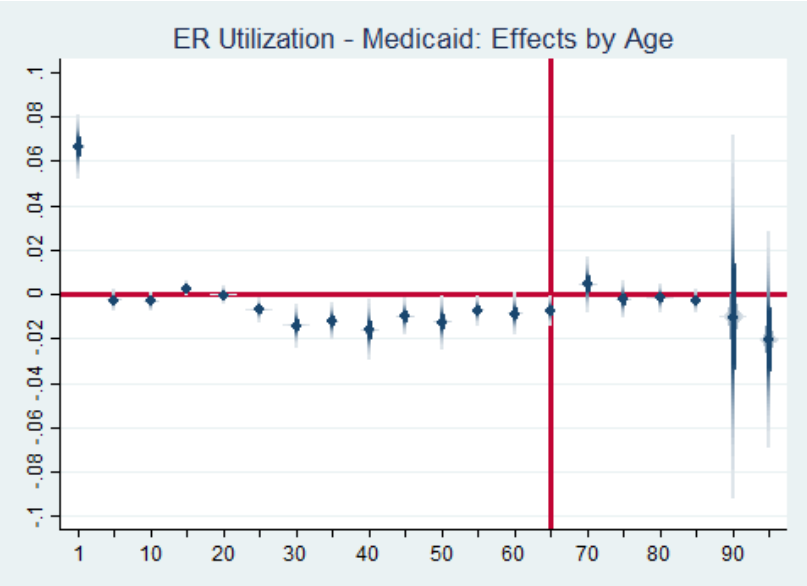


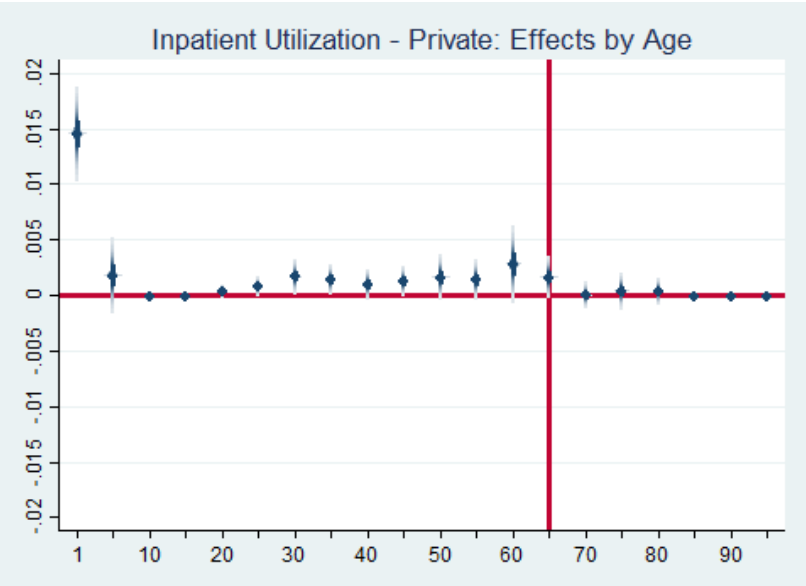


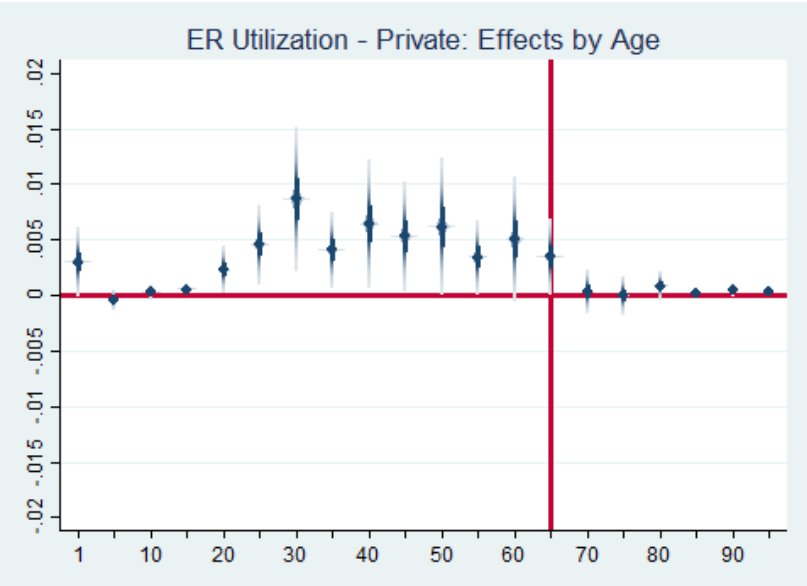


Effects by Age





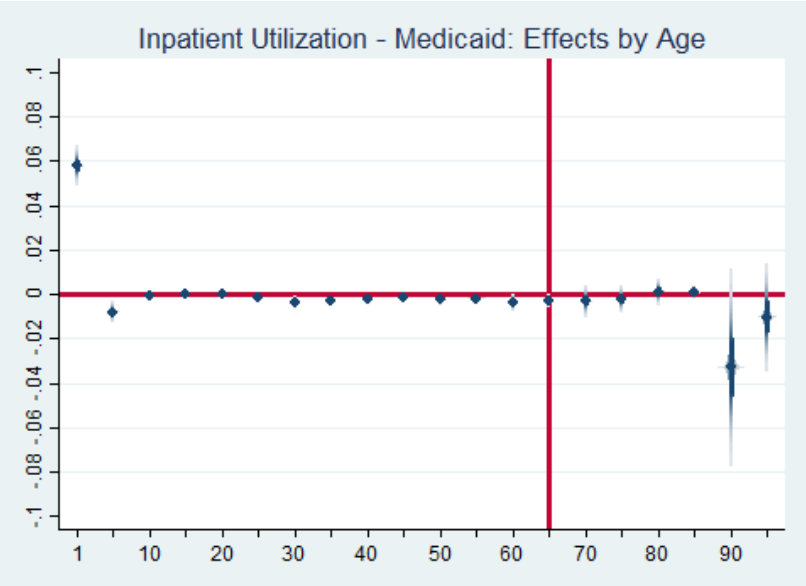




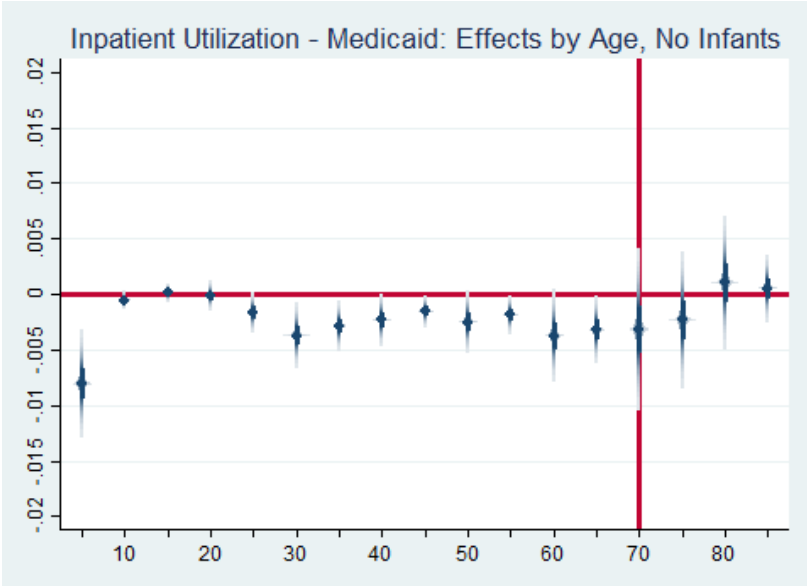
Effects by Age

w/ and w/o infants

W/ Infants - Scale -0.1 to 0.1

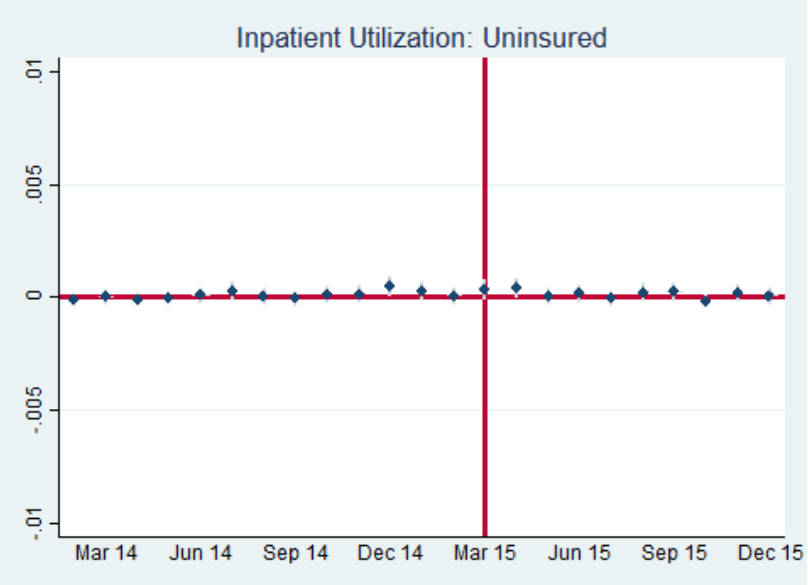


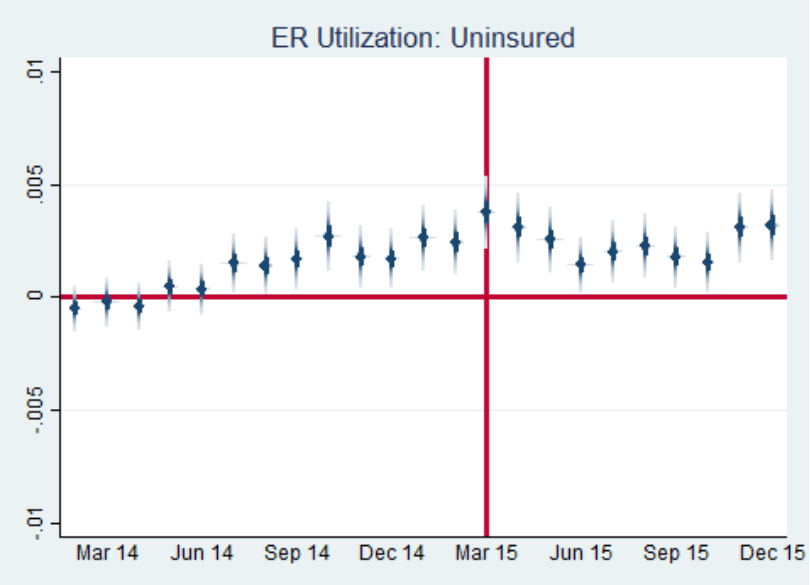
W/O Infants - Scale -0.02 to 0.02



Appears to have been some harm to the very young.

Uninsured Utilization





Ramp up in uninsured ER use *before* expiration of benefits.

Results

Impact on Infants: Medicaid

	Inpatient		ER	
COFA	-0.0019***	-0.0029***	-0.0062***	-0.0075***
	(0.0002)	(0.0003)	(0.0006)	(0.0007)
COFA $\times$ Infant		0.0605***		0.0736***
		(0.0035)		(0.0057)

Conclusions

- After expiration of Medicaid benefits, COFA migrants saw:
  - Decline in Medicaid-funded admissions.

Inpatient 37% decline.
ER 32% decline.

  - Increase in Privately funded admissions.

Inpatient 241% increase.
ER 130% increase.

- But on net, medical consumption declined.

Conclusions

- Fundamental questions:

  Was there overconsumption under Medicaid?

  Or was the reduction in medical care harmful?

- Hard to answer without data on outcomes.

- But the impacts on infants point towards some harm.

Conclusions

"There is concern that this process, which has been proven to be confusing even for native English speakers, will at best be confusing for COFA migrants and at worst cause individuals to be uninsured and possibly forego needed health care."

Inada, Yamada, Tanaka, and Ostrowski
Journal of Health Care for the Poor and Underserved
May 2015