

The Effect of Medicaid Cuts on Dental-related ED Visits in Maricopa County

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Outline

- 1 Introduction
 - Why ED dental visits?
 - Objectives
- 2 Materials and Methods
 - Data & data sources
 - Methods
- 3 Results
 - Hospital visits
 - Percent rate ratio (PR)
 - Change points
- 4 Discussions
- 5 Acknowledgments

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Cost of ED dental visits

- Emergency department (ED) dental visits are costly¹
 - \$ 2.7 Billions between 2008 & 2010
 - \$526-\$760 per single visit
- ED dental visits are an ineffective mean of providing dental care²
 - No preventive care
 - No follow up
 - Only treat immediate symptoms

¹ Allareddy, et al., 2014. J. Am. Dent. Assoc. 145, 331-337

² Lewis, et al., 2003. Ann. Emerg. Med. 42, 93-99.

Population demographics

- Uninsured patients (40%)³
 - Most likely low income population
- Medicaid patients (30%)³
 - Medicaid reimbursement rates are lower than private insurance plans
 - Most private dentists do not participate in Medicaid⁴
- Adults 21 years of age or older (90%)³

³Seu, et al., Healthcare Cost and Utilization Project (HCUP) Statistical Briefs. Agency for Health Care Policy and Research Rockville (MD).

⁴Backus, et al., 2001. J. Gen. Intern. Med. 16, 815-821.

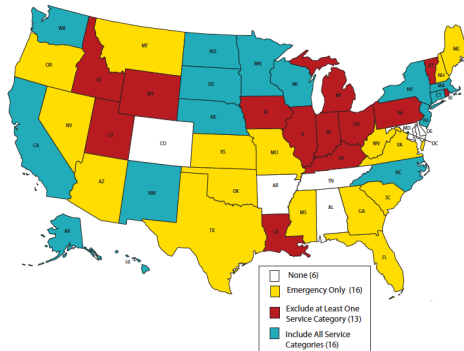
Medicaid dental coverage

- The recent economic recession (2007–2013) affected many families and individuals → increased Medicaid benefits eligibility
- Many states (including Arizona) made significant cuts to Medicaid⁵
- Some dental benefit for adults (≥ 21) on Medicaid (known as the Arizona Health Care Cost Containment System or AHCCCS) were eliminated in 2010⁶

⁵ National Academy for State Health Policy, October 2008. Portland, ME. Available at: www.nashp.org/Files/shpmonitor_adulthooddental.pdf

⁶ AHCCCS, 2010. AHCCCS Benefit Changes Effective October 1, 2010. Phoenix, AZ.

Medicaid coverage for ED dental services (2007)



Source: <http://www.nashp.org/sites/default/files/Adult%20Dental%20Monitor.pdf>

Effect of policy changes ED dental visits

- The effect of Medicaid cuts on ED dental visits have been studied by several researchers
- ED dental visits have been found to increase by 2% and 14% during the first and second years following Medicaid cuts in Massachusetts⁷
- In another study, cuts to medicaid benefits for ED dental visits was found to increase ED dental visits by 21% in Maryland⁸

⁷Neely, et al., 2014. Am. J. Public Health 104, 6.

⁸Cohen, et al., 1996. J Am Dent Assoc, 127, 5.

Potential limitations

① Small population

- Both studies were based on visits from one hospital (Boston Medical Center & UM Teaching hospital)

② Confounders

- Observed changes in ED dental visits could be a manifestation of the overall hospital visits patterns rather than a consequence of changes in Medicaid coverages

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Objectives

To evaluate changes in ED dental visits in Maricopa County before and after Medicaid benefit cuts implemented in October, 2010 by:

- 1 Comparing changes in dental and non-dental visits over time
- 2 Comparing changes in payer type

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Hospital discharge data

Hospital discharge data (HDD)

- Visit type: dental or non-dental
- Visit date
- Patient's age: <21 or ≥ 21
- Primary payer: AHCCCS, Medicare, Self, Others

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Methods

- Count and % of dental and non-dental visits were calculated for each subgroup, by the year of visit
- A **percentage rate ratio (PR)** between dental and non-dental ED visits was calculated for each subgroup, by visit year as:

$$PR_{i,j} = \frac{\%Dental\ ED\ visits_{i,j}}{\%Non-dental\ ED\ visits_{i,j}}$$

Methods

$$PR_{i,j} = \frac{\%Dental\ ED\ visits_{i,j}}{\%Non-dental\ ED\ visits_{i,j}}$$

- Percent ratio of category i for the year of visit j ($PR_{i,j}$): where i represents a payer type or age group
- $\%Dental\ ED_{i,j}$: % of dental ED visits of category i for the year j
- $Non-Dental\ ED_{i,j}$: % of non-dental ED visits of category i for the year j

Methods

PR:

- Reflects yearly changes in ED dental visits
- Includes non-dental ED visits as a comparison group to account for changes in total hospital visits
- Changes in PR relative to the date when changes in AHCCCS were implemented → indicator for the effect of new policy

Methods

A *changepoint*⁹ package in R was used to identify changes in the mean number of ED dental visits over time:

- Change point: a point in time that marks a significant change in the mean of a time series
- Based on the general likelihood approach
- Test the hypotheses of no change point in the time series (the null) vs. one or more change point

⁹Killick, R. and Eckley, I.A., 2014. Journal of Statistical Software 58, 1-19. 

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Hospital visits

Emergency department (ED) and inpatient (IP) hospital visits
in MC (2006–2012)

Year	ED		IP		Total
	Count	%	Count	%	
2006	987,093	66.2	503,615	33.7	1,490,708
2007	1,063,368	67.5	511,298	32.4	1,574,666
2008	1,106,343	67.8	524,609	32.1	1,630,952
2009	1,162,296	68.6	530,330	31.3	1,692,626
2010	1,162,556	68.5	533,749	31.4	1,696,305
2011	1,246,804	69.6	543,456	30.3	1,790,260
2012	1,302,307	71.4	520,375	28.5	1,822,682
Total	8,030,767	68.6	3,667,432	31.35	11,698,199

ED dental visits

Count and percentages of dental ED visits for children and adults in MC (2006–2012)

Year	Adults		Children		Total
	Count	%	Count	%	
2006	9,257	82.0	2,023	17.9	11,280
2007	10,878	83.8	2,094	16.1	12,972
2008	11,453	84.5	2,093	15.4	13,546
2009	12,324	85.6	2,073	14.4	14,397
2010	13,332	85.8	2,199	14.1	15,531
2011	15,471	87.5	2,204	12.4	17,675
2012	16,493	88.7	2,091	11.2	18,584
Total	89,208	85.7	14,777	14.2	103,985

Non-dental ED visits

Count and percentages of non-dental ED visits for children and adults in MC (2006–2012)

Year	Adults		Children		Total
	Count	%	Count	%	
2006	622,682	63.8	353,131	36.2	975,813
2007	669,213	63.7	381,183	36.3	1,050,396
2008	706,576	64.7	386,221	35.3	1,092,797
2009	729,847	63.6	418,052	36.4	1,147,899
2010	760,141	66.3	386,884	33.7	1,147,025
2011	831,284	67.6	397,845	32.4	1,229,129
2012	869,915	67.8	413,808	32.2	1,283,723
Total	5,189,658	65.5	2,737,124	34.5	7,926,782

Payer type

ED dental visits by expected payer type in MC (2006–2012)

Year	AHCCCS		Medicare		Others		Self		Total
	Count	%	Count	%	Count	%	Count	%	
2006	4,731	41.94	433	3.84	2,352	20.85	3,764	33.37	11,280
2007	5,380	41.47	478	3.68	2,733	21.07	4,381	33.77	12,972
2008	5,807	42.87	641	4.73	3,409	25.17	3,689	27.23	13,546
2009	7,075	49.14	756	5.25	2,542	17.66	4,024	27.95	14,397
2010	8,020	51.64	684	4.40	2,510	16.16	4,317	27.80	15,531
2011	9,343	52.86	804	4.55	2,664	15.07	4,864	27.52	17,675
2012	8,183	44.03	884	4.76	2,806	15.10	6,711	36.11	18,584
Total	48,539	46.68	4,680	4.5	19,016	18.29	31,750	30.53	103,985

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2006	41.9	3.8	20.8	33.4	11,280
2007	41.5	3.7	21.1	33.8	12,972
2008	42.9	4.7	25.2	27.2	13,546
2009	49.1	5.2	17.7	27.9	14,397
2010	51.6	4.4	16.2	27.8	15,531
2011	52.9	4.5	15.1	27.5	17,675
2012	44.0	4.8	15.1	36.1	18,584
Total	46.7	4.5	18.29	30.53	103,985

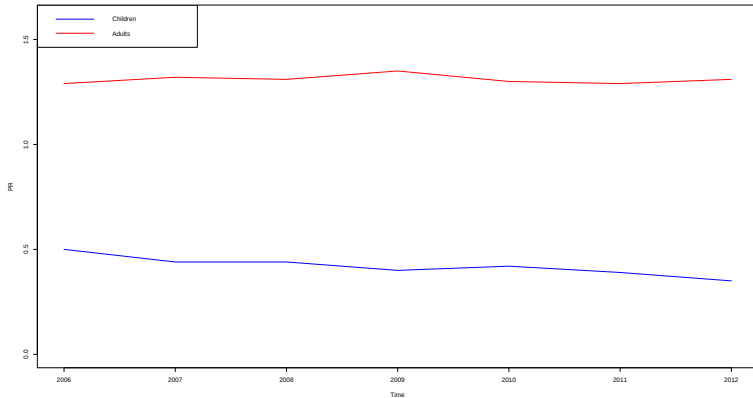
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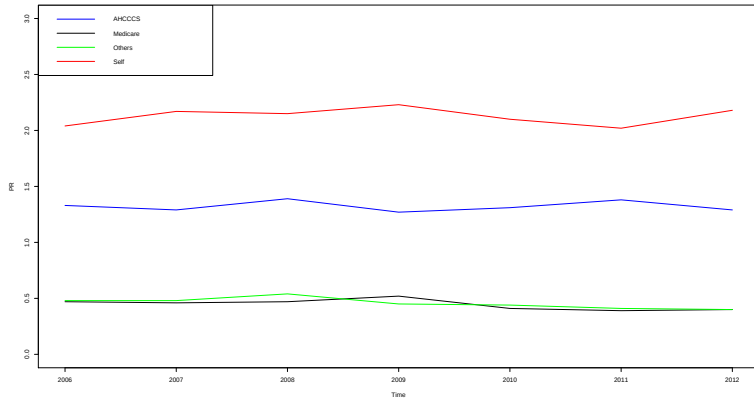
Rate ratio of ED dental visits compared non-dental ED visits in
MC (2006–2012)

Year	Adults	Children	AHCCCS	Medicare	Others	Self
2006	1.29	0.50	1.33	0.47	0.48	2.04
2007	1.32	0.44	1.29	0.46	0.48	2.17
2008	1.31	0.44	1.39	0.47	0.54	2.15
2009	1.35	0.40	1.27	0.52	0.45	2.23
2010	1.30	0.42	1.31	0.41	0.44	2.10
2011	1.29	0.39	1.38	0.39	0.41	2.02
2012	1.31	0.35	1.29	0.40	0.40	2.18

PR–Age groups



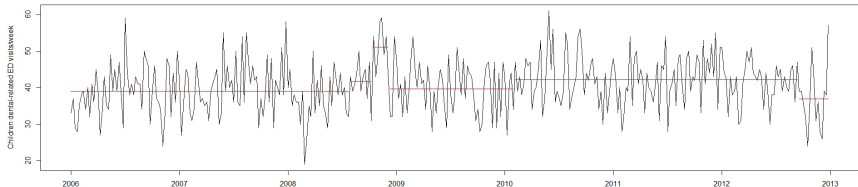
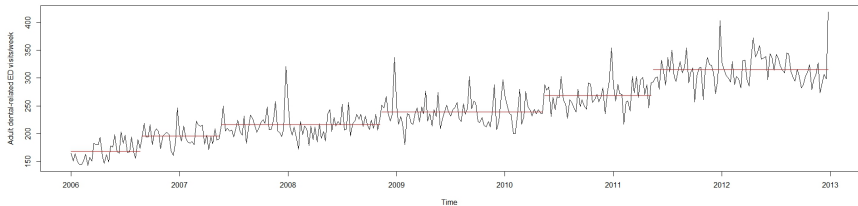
PR-payer types



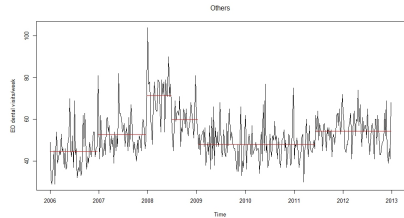
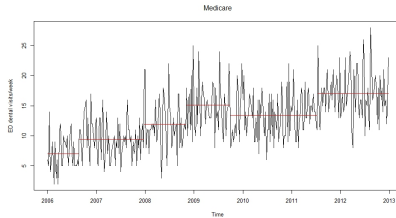
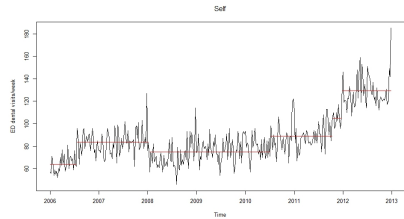
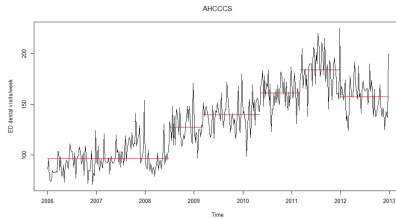
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Change point –Age groups



Change point–Payer



Effect of Medicaid benefit cuts on ED dental visits

- Total ED visits increased steadily from 2006 through 2012
- Adult ED visits for dental reasons, as a percentage of all ED visits, also increased steadily during the same period
before and after AHCCCS changes were implemented
- Similarly, adult ED visits for non-dental reasons increased overtime
- Additionally, % AHCCCS patients visiting EDs for dental and for non-dental reasons increased in a similar fashion

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Effect of Medicaid benefit cuts on ED dental visits

- PRs suggest that the overall ED dental visits before and after AHCCCS benefit cuts were colorbleunot substantially different
- However, payer data showed:
 - ↓ in ED dental visits of AHCCCS patients in 2011–12
 - ↑ in ED dental visits of self-paid patients in 2011–12
- While the overall PR of ED dental visits before and after the cuts were unchanged, there was an **apparent shift** in payer type

Methodological considerations

- Crude count and/or % of ED dental visits are not reliable indicators of the effect of policy changes
 - ⇒ Observed changes might be a mere reflection of an overall hospital visits trend and not specific to dental visits
- The use of a “control” group is important to account other factors influencing the population dynamics
- Comparing the crude numbers or %s before and after an intervention can be misleading ⇒ use a suitable analytic approach

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Limitations

- Payer type: primary expected payer and does not account for patients with multiple payer sources
- Patterns of ED visits from Self-paid patients might be influenced by additional factors such unemployment, immigration, migration. . .
- Patterns observed may not be generalizable to other populations

- Co-authors:
 - Mac McCullough
 - Kate Goodin
 - Larry Glickman
 - Kirstin Roling
- Katherine Muenster

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Thank you!

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