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RESEARCH BRIEF

Early Impact of the Affordable Care Act's Medicaid Expansion on Dental Care Use

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Objective. To examine the impact of the Affordable Care Act on dental care use among poor adults ages 21–64 in 2014.

Data. 2010–2014 Gallup-Healthways Wellbeing Index Survey.

Study Design. Among poor adults with income at or below 138% of the Federal Poverty Level, a differences-in-differences analysis was used to compare the changes in dental care use in states with different Medicaid expansion and adult dental policies.

Principal Findings. Relative to the pre-reform period and other states, in Medicaid expansion states with adult dental benefits, dental care use increased between 2 and 6 percent points in the second half of 2014, but most of these changes were not statistically significant.

Conclusions. Early evidence suggests that the Affordable Care Act may either not be having a substantial impact on dental care use or it is too early to assess the impact.

Key Words. Medicaid, health reform, dental care

Medicaid expansion has the potential to increase dental benefits coverage to low-income adults in states that have chosen to expand Medicaid eligibility under the Affordable Care Act (ACA) and to provide dental benefits to adults in their Medicaid program. Adult dental benefits are eligible for the enhanced federal match for the Medicaid expansion population (Chazin, Guerra, and McMahon 2014; Center for Health Care Strategies 2015). As of August 2014, 27 states and the District of Columbia provided dental benefits to Medicaid adults (Nasseh, Vujicic, and Yarbrough 2014; Medicaid and CHIP Payment

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and Access Commission [MACPAC] 2015). Of these, 18 states and the District of Columbia expanded Medicaid eligibility under the ACA as of December 2014 (Kaiser Family Foundation 2015). We estimate that 5.7 million adults gained Medicaid coverage with dental benefits in these states in 2014, a 40.9 percent increase from 2013 (Table 1).

In this study, we use nationally representative survey data from 2010 through 2014 to assess the impact of Medicaid expansion on dental care use. Our focus is on poor adults ages 21–64 with incomes at or below 138 percent of the federal poverty level (FPL). We compare trends in dental care use among poor adults across four categories of states: (1) states that expanded Medicaid and provide adult Medicaid dental benefits; (2) states that did not expand Medicaid but provide adult Medicaid dental benefits; (3) states that expanded Medicaid but do not provide adult Medicaid dental benefits; and (4) states that did not expand Medicaid and do not provide adult Medicaid dental benefits (Table 1).

STUDY DATA AND METHODS

Data Source

We use data from the 2010–2014 Gallup-Healthways Wellbeing Index survey. The Gallup Wellbeing Index is a nationally representative daily telephone survey of adults ages 18 years and older that asks questions on health insurance, access to care, dental care use, and health status. A state identifier is included with each survey respondent, which allows us to exploit state variation in adult Medicaid dental policy. The Gallup Wellbeing Index has also been used recently in peer-reviewed research examining the impact of the ACA (Sommers et al. 2014, 2015). Every quarter, Gallup surveys approximately 30,000 adults under age 65 (Sommers et al. 2014).

Study Sample and Variable Definitions

Our sample includes poor adults ages 21 through 64 with household income at or below 138 percent of the FPL and spans interviews that occurred from

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Table 1: Classification of States by Medicaid Expansion Status and Level of Adult Dental Benefits

<i>Classification</i>	<i>States</i>	<i>2013 Adult Medicaid Enrollment</i>	<i>2014 Adult Medicaid Enrollment</i>	<i>Percentage Change in Adult Medicaid Enrollment (2013-2014)</i>
States with Adult Dental that Expanded Medicaid (18 States and District of Columbia)	Arkansas, California, Colorado, Connecticut, District of Columbia, Illinois, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, New Jersey, New Mexico, New York, Ohio, Oregon, Rhode Island, Vermont, Washington	13,973,589 [60.8%]	19,685,293 [65.2%]	40.9
States with Adult Dental that Did Not Expand Medicaid (9 States)	Alaska, Indiana, Nebraska, North Carolina, North Dakota*, Pennsylvania, South Dakota, Wyoming, Wisconsin	2,768,744 [12.1%]	2,964,173 [9.8%]	7.1
States without Adult Dental that Expanded Medicaid (7 States)	Arizona, Delaware, Hawaii, Maryland, Nevada, New Hampshire, West Virginia	1,175,652 [5.1%]	2,041,991 [6.8%]	73.7

Continued

Table 1. Continued

Classification	States	2013 Adult Medicaid Enrollment	2014 Adult Medicaid Enrollment	Percentage Change in Adult Medicaid Enrollment (2013–2014)
States without Adult Dental that Did Not Expand Medicaid (16 States)	Alabama, Florida, Georgia, Idaho, Kansas, Louisiana, Maine, Missouri, Mississippi, Montana, Oklahoma, South Carolina, Tennessee, Texas, Utah, Virginia	5,049,624 [22.0%]	5,489,239 [18.2%]	8.7
Total	Total	22,967,609	30,180,696	31.4

Notes: Percent of adult Medicaid enrollees by policy level for 2013 and 2014 are in brackets. Level of adult Medicaid dental benefits determined as of August 2014. Michigan expanded Medicaid on April 1, 2014. New Hampshire expanded Medicaid on August 15, 2014.

*State expanded Medicaid to 138% of the FPL but did not provide dental benefits to the expansion population. We estimated adult Medicaid enrollment in each state by subtracting children eligible for EPSDT services as documented in state-level CMS-416 forms from total Medicaid and CHIP enrollment in each state. For 2013 and 2014, we determined average total Medicaid and CHIP enrollment from July to September.

Sources: (1) Kaiser Family Foundation. Status of State Action on the Medicaid Expansion Decision as of January 12, 2016. Available from <http://kff.org/health-reform/state-indicator/state-activity-around-expanding-medicare-under-the-affordable-care-act/>. (2) Kaiser Family Foundation. Total Monthly and Medicaid and CHIP enrollment. Pre-ACA Average Monthly Enrollment (July–September 2013). October 2015. Available from <http://kff.org/health-reform/state-indicator/total-monthly-medicare-and-chip-enrollment/>. (3) Pre-ACA Average Monthly Enrollment (July–September 2013) for Connecticut from Becker AL. CT Medicaid enrollment at record high under Obamacare. May 2014. Available from <http://ctmirror.org/2014/05/28/ct-medicare-enrollment-at-record-high-under-obamacare/>. (4) Pre-ACA Average Monthly Enrollment (2013) for Maine from Kaiser Family Foundation. Medicaid Enrollment: June 2013 Data Snapshot. January 2014. Available from <https://kaiserfamilyfoundation.files.wordpress.com/2014/01/8050-07-medicare-enrollment-june-2013-data-snapshot1.pdf>. (5) Nasseh K, Vujicic M, Yarbrough C. A ten-year, state-by-state, analysis of Medicaid fee-for-service reimbursement rates for dental care services. Health Policy Institute Research Brief. American Dental Association. October 2014. Available from http://www.ada.org/~media/ADA_Science%20and%20Research/HPI/Files/HPIBrief_1014_3.ashx. (6) Sanford Health Plan. FAQs on North Dakota's Medicaid expansion. Available from https://und.edu/health/wellness/student-health/_files/docs/sanford-health-plan-faq-medicare-expansion.pdf. (7) Medicaid and CHIP Payment and Access Commission [MACPAC]. Medicaid Coverage of Dental Benefits for Adults. June 2015. Available from <https://www.macpac.gov/wp-content/uploads/2015/06/Medicaid-Coverage-of-Dental-Benefits-for-Adults.pdf>.

January 2, 2010 through December 30, 2014. We drop adults ages 18–20 from our analysis because many states provide pediatric dental coverage to these individuals (Centers for Medicare and Medicaid Services [CMS] Undated). We also exclude elderly adults 65 and over since the policy changes we analyzed are targeted to poor adults ages 21–64. After imposing these restrictions, our sample includes 166,077 individuals.

The Gallup Wellbeing Index survey does not directly classify adults into income categories based on percentage of the FPL. Instead, Gallup asks adults to report their monthly household income and records responses into 10 categories. Over the course of a month, households are asked if they earn less than \$60, \$60 to less than \$500, \$500 to less than \$1,000, \$1,000 to less than \$2,000, \$2,000 to less than \$3,000, \$3,000 to less than \$4,000, \$4,000 to less than \$5,000, \$5,000 to less than \$7,500, \$7,500 to less than \$10,000, or \$10,000 or more. We annualize household income by multiplying the endpoints of each income category by 12. We use total household size, defined as the number of adults and children in a household, and the midpoints of each income bracket to define household income as a percentage of the FPL.

The dependent variable used in this analysis is a binary indicator determining whether an adult visited a dentist in the past 12 months. We include as explanatory variables an indicator variable for employment status, sex, a categorical variable for ethnicity/race (Hispanic, black, white, Asian, or other race), and age.

Methodology

We use a differences-in-differences analysis to assess changes in dental care use in states that expanded Medicaid and provide adult dental benefits. We measure differences in this group of states relative to three different comparison groups: (1) states that did not expand Medicaid and do not provide adult dental benefits (comparison group 1); (2) states that did not expand Medicaid but do provide adult dental benefits (comparison group 2); and (3) states that did expand Medicaid but do not provide adult dental benefits (comparison group 3) (Table 1). There is wide variation in dental benefits in states have an adult dental benefit in Medicaid. We classify states as having an adult dental benefit if they provide at least preventive dental services. Since we analyze nonelderly adults ages 21–64, if a state only provides Medicaid dental benefits for dentures, we do not consider that state to have an adult Medicaid dental benefit. We choose these three groups of states as comparison groups since we

would expect very little change in dental care use among poor adults in these states in 2014. However, it is still possible that dental care use could increase in comparison group 2 or 3. In states that expanded Medicaid but do not provide adult dental benefits, poor adults gaining health coverage may have pent-up dental care needs and may learn of settings like federally qualified health centers (FQHCs) or emergency rooms where they can access dental care. This can be thought of as a “spillover effect” of Medicaid expansion. In states that did not expand Medicaid but provide adult dental benefits, it is possible that more poor adults visit the dentist due to a “woodwork effect” (Yarbrough, Vujicic, and Nasseh 2014). We would expect very little change in dental care use among poor adults in states that did not expand Medicaid and do not provide adult dental benefits. One can hypothesize that the largest post-reform difference-in-differences policy estimates would come from using comparison group 1 as the reference category.

All changes are measured with respect to the pre-reform period, which spanned from the first half of 2010 through the first half of 2013. Open enrollment under the ACA began on October 1, 2013, which corresponds to the start of the post-reform period (Vargas 2013). The pre-reform period was defined through the third quarter of 2013 in previous research (Sommers et al. 2014). Since we analyze the data at half-year intervals, we consider the second half of 2013 as post-reform. Between October 1, 2013 and December 31, 2013, the Centers for Medicare and Medicaid Services (CMS) determined that 6.3 million individuals were newly eligible for Medicaid and CHIP (Kaiser Family Foundation 2014). For ease of interpretability, we estimate the following linear probability model:

$$\begin{aligned}
 \text{Dental Visit} = & \beta_0 + \beta_{1_j}\text{SecondHalf_2013}_t * \text{Policy}_{stj} \\
 & + \beta_{2_j}\text{FirstHalf_2014}_t * \text{Policy}_{stj} \\
 & + \beta_{3_j}\text{SecondHalf_2014}_t \\
 & * \text{Policy}_{stj} + \gamma_{0s} + \gamma_{1s}t + \theta_t + X_i\delta + \varepsilon_{ist}
 \end{aligned}
 \tag{1}$$

where i represents an individual, t represents time, and s represents state. The vector, X_i , includes age, sex, race/ethnicity, and employment status. Our model includes state fixed-effects, γ_{0s} , half-year fixed-effects, θ_t , and state-specific linear time trends, γ_{1s} . The linear trend term measures the number of periods from the beginning of the study (first half of 2010 is 1; second half of 2014 is 10). The term, Policy_{stj} , is a four-level categorical variable equal to 1 if an

individual lives in one of the four categories of states specified in Table 1. The coefficients $\beta_{1,j} - \beta_{3,j}$ ($j = 1, 2, 3$) are the relevant policy parameters of interest that measure the impact of the ACA on dental care use over and above any change in utilization in the set of states chosen as the comparison group. We cluster all estimated standard errors at the state level. To account for nonresponse bias in the survey, we utilize the sampling weights provided by Gallup. We use a multivariate regression model to impute income. For more details, please see the Supplementary Appendix.

We perform sensitivity analysis by using unimputed income as opposed to imputed income. We also assess the impact of the ACA on dental care use among higher income adults (FPL 139–400% and FPL >400%). We hypothesize that Medicaid expansion should have little to no impact on dental care use among higher income adults.

In the four categories of states defined in Table 1, we assess differences in pre-reform trends. Different pre-reform trends may suggest that changes in dental care use may have occurred in the absence of any reform. For the pre-reform period, we test for differences in pre-reform trends by regressing the dental visit indicator variable on a half-year linear trend variable, the Policy_{stj} categorical variable, and the interaction term between the linear trend variable and Policy_{stj} . The interaction term measures the difference in trend between states that have an adult Medicaid dental benefit or expanded Medicaid and the comparison group. This regression includes the vector of control variables, \mathbf{X}_s , specified in equation (1).

We also examine the extent to which Medicaid coverage increased among poor adults in states with different dental and Medicaid expansion policies. We constructed a Medicaid coverage indicator variable based on the insurance coverage questions in the Gallup WBI survey. We then estimate equation (1), but with a Medicaid coverage dependent variable replacing the dental visit dependent variable.

Limitations

We cannot determine whether a respondent visited a dentist in the past 3, 6, or 18 months. This limits our ability to determine whether a dental visit occurred after an individual became eligible for Medicaid as a result of the ACA. Because of the 12-month look-back period, any effects of Medicaid coverage on dental care use could be understated.

STUDY RESULTS

In the Supplementary Appendix (Table A1), we present summary statistics for our sample. Figure A1 shows trends in dental care use among poor adults in the four defined categories of states.

In Table 2, we compare changes in dental care use among poor adults in Medicaid expansion states that provide adult dental benefits versus three comparison groups: nonexpansion states that do not provide adult dental benefits, nonexpansion states that provide adult dental benefits, and expansion states that do not provide adult dental benefits. Pre-reform, 48.5 percent of poor adults had a dental visit in the past year in Medicaid expansion states that provide adult dental benefits. Dental care use was lower in our first comparison group, nonexpansion states that do not provide adult dental benefits, with 39.8 percent of poor adults having a dental visit. Post-reform, dental care use in expansion states with adult dental benefits increased to 50.5 percent by the second half of 2014. In nonexpansion states without adult dental benefits, dental care use held steady through the second half of 2014 (39.8 percent). According to our difference-in-differences policy estimates, relative to the pre-reform period and this first comparison group of states, dental care use among poor adults increased 2.9 percentage points in the second half of 2014 in expansion states with adult dental benefits, but this change was not statistically significant ($p = .083$).

Dental care use among poor adults in the second comparison group, nonexpansion states with adult dental benefits, declined from 49.3 percent in the pre-reform period to 46.2 percent in the second half of 2014. Relative to the pre-reform period and this second comparison group, dental care use in expansion states with adult dental benefits increased by 6.2 percentage points in the second half of 2014 ($p = .043$).

Finally, in the third comparison group, expansion states with no adult dental benefits, 42.6 percent of poor adults had a dental visit pre-reform compared to 43.1 percent in the second half of 2014. Relative to the pre-reform period and this third comparison group, dental care use in expansion states with adult dental benefits increased by 1.2 percentage points in the second half of 2014, but this change was not statistically significant ($p = .763$).

Medicaid coverage among poor adults increased significantly by the second half of 2014, particularly in Medicaid expansion states with adult dental benefits (Table A2). Relative to the pre-reform period and nonexpansion states without adult dental benefits, Medicaid coverage increased by 8.9

Table 2: Dental Care Use among Adults with Income Less Than or Equal to 138 Percent of the Federal Poverty Level: Pre- and Post-ACA Reform

Classification	Pre-ACA Reform		Post-ACA Reform	
	First Half 2010–First Half 2013	Second Half 2013	First Half 2014	Second Half 2014
Adult Medicaid Dental and Expansion of Medicaid Comparison Group #1	48.5%	48.7%	48.6%	50.5%
No Adult Medicaid Dental and No Expansion of Medicaid Comparison Group #1	39.8%	38.5%	39.9%	39.8%
Adjusted Difference-in-Difference Estimates (in Percentage Points)	–	1.9 (–0.9, 4.8) [0.172]	0.6 (–2.2, 3.4) [0.666]	2.9 (–0.4, 6.1) [0.083]
Comparison Group #2	49.3%	46.7%	46.1%	46.2%
Adult Medicaid Dental and No Expansion of Medicaid Comparison Group #2	–	2.5 (–1.4, 6.5) [0.205]	3.7 (–2.2, 9.6) [0.218]	6.2 (0.2, 12.1) [0.043]
Adjusted Difference-in-Difference Estimates (in Percentage Points)	–	–	–	–
Comparison Group #3	42.6%	44.7%	42.0%	43.1%
No Adult Medicaid Dental but Expansion of Medicaid Comparison Group #3	–	–2.0 (–8.2, 4.3) [0.534]	0.3 (–3.9, 4.5) [0.901]	1.2 (–7.0, 9.5) [0.763]
Adjusted Difference-in-Difference Estimates (in Percentage Points)	–	–	–	–

Notes: Adjusted differences-in-differences estimates derive from regression that controls for age, sex, employment status, and race/ethnicity. Regression includes state fixed-effects, half-year fixed-effects, and state-specific linear time trends. Calculated standard errors from regression clustered by state. 95% confidence intervals in parentheses. *p*-values in brackets. All estimates are weighted using Gallup sampling weights. Number of observations: 166,077.

Source: 2010–2014 Gallup-Healthways Wellbeing Index Survey.

percentage points by the second half of 2014 ($p < .01$). Compared to nonexpansion states without adult dental benefits, Medicaid coverage did not change by a statistically significant amount in nonexpansion states with adult dental benefits. In expansion states without adult dental benefits, Medicaid coverage increased 5–7 percent points in 2014.

Differences-in-differences policy estimates are very similar when unimputed as opposed to imputed income is used to identify poor adults (Table A3). Relative to the three possible comparison groups, dental care use among higher income adults (FPL 139–400% and FPL >400%) did not increase by a statistically significant margin in Medicaid expansion states with adult dental benefits (Table A4 and A5). Pre-reform trends in dental care use among poor adults in the four categories of states were also not statistically different from one another (Table A6).

DISCUSSION

Among poor adults, we measured changes in dental care use in expansion states with adult Medicaid dental benefits relative to states that did not expand Medicaid and/or do not have adult Medicaid dental benefits. Expansion states with adult dental benefits experienced the largest increase in the percentage of poor adults with Medicaid coverage in 2014. This increase was larger in magnitude than in other categories of states.

When measured against changes in dental care use in the three comparison groups, dental care use in expansion states with adult dental benefits increased anywhere from 2 to 6 percent points in the second half of 2014, but most of the changes were not statistically significant. In our view, this suggests that the ACA is not having a substantial impact on dental care use among poor adults, either through a direct effect in Medicaid expansion states with adult dental benefits, or the “woodwork effect” in nonexpansion states with adult dental benefits, or the “spillover effect” in expansion states without adult dental benefits. We also recognize that it may also simply be too early to assess the impact from the ACA on dental care use among poor adults. We also found that in nonexpansion states that provide adult dental benefits, dental care use declined in the post-reform period. We find this result surprising, and we do not have a good explanation. Dental care use in these states may have declined due to factors beyond our analysis, such as changes in administrative arrangements within the dental component of the Medicaid program.

We caution that our analysis only provides an early view of the impact of the ACA on dental care use. The full effect of the ACA cannot be fully assessed until more national and state-level data become available. In the coming years, many states still have the option to expand Medicaid eligibility and to include adult dental benefits in their Medicaid program. Future research ought to explore the implications of such policy changes.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Figure A1. Unadjusted Trends in Dental Care Use in Past 12 Months among Poor Adults (First Half 2010 through Second Half 2014).

Table A1. Summary Statistics. Low-Income Respondents. Individuals with Household Income at or below 138 Percent of the Federal Poverty Level.

Table A2. Adjusted Differences-in-Differences Policy Estimates (in Percentage Points). Impact of ACA on Receipt of Medicaid Benefits among Adults with Income Less Than or Equal to 138 Percent of the Federal Poverty Level.

Table A3. Adjusted Differences-in-Differences Policy Estimates (in Percentage Points). Impact of ACA on Dental Care Use in Medicaid Expansion States with Adult Medicaid Benefits. Adults with Income Less Than or Equal

to 138 Percent of the Federal Poverty Level. Un-Imputed Income Used to Identify Poor Adults.

Table A4. Adjusted Differences-in-Differences Policy Estimates (in Percentage Points). Impact of ACA on Dental Care Use in Medicaid Expansion States with Adult Medicaid Benefits. Adults with Income 139–400 Percent of the Federal Poverty Level.

Table A5. Adjusted Differences-in-Differences Policy Estimates (in Percentage Points). Impact of ACA on Dental Care Use in Medicaid Expansion States with Adult Medicaid Benefits. Adults with Income Greater than 400 Percent of the Federal Poverty Level.

Table A6. Regression Estimates Determining Any Differences in Pre-ACA Reform Trends between States with Different Medicaid Expansion and Adult Dental Benefit Policies.