

The Impact of Dental Integration in Oregon's Medicaid Program

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Executive Summary

Federal authorities, researchers, and practitioners have recommended closer integration of dental care with other health care. Models of dental integration include delivery of basic dental services by doctors and other health care providers, enhanced communication and consultation between dental care and health care providers, and payment systems that integrate funding for medical and dental care. These models could improve access to dental care by expanding the number of providers delivering dental services, increase the detection of medical and dental problems before they escalate, and give medical and dental providers a financial stake in patients' overall health.

Oregon's effort to transform its Medicaid program through coordinated care organizations (CCOs) includes integration of funding for dental services and financial incentives for achieving dental quality goals:

- **CCOs' global budgets include funding for dental services:** CCOs receive a per capita global budget that includes funding for physical, behavioral, and dental care. State legislation required CCOs to contract with dental care organizations (DCOs) in CCOs' service areas to manage dental benefits beginning on July 1, 2014.
- **CCO incentive measures include two dental quality measures:** CCOs may receive bonus payments from a quality pool for their performance on incentive measures. The Oregon Health Authority (OHA) adopted two dental quality measures as CCO incentive measures starting in 2015: Mental, Physical, and Dental Health Assessments within 60 Days for Children in Department of Human Services Custody and Dental Sealants on Permanent Molars for Children Ages 6 – 14.

This report evaluates the effects of integrating funding for dental services into CCOs' global budgets. We compared dental outcomes in two time periods before and after this policy change:

- **Pre-integration period:** January 2012 – June 2013
- **Post-integration period:** July 2014 – December 2015

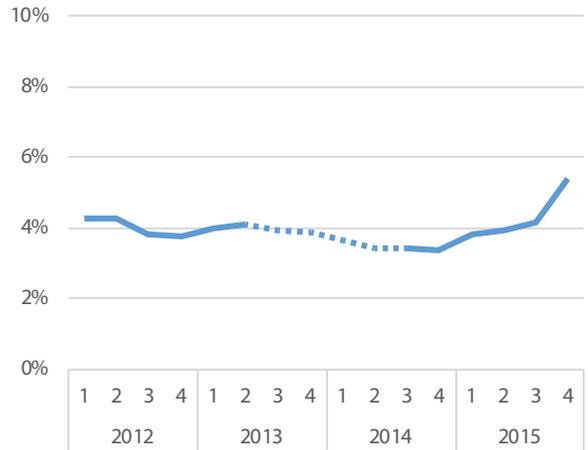
We used statistical analysis to control for observable factors aside from dental integration that may have affected outcomes.

Integration of funding for dental services into CCOs' global budgets was associated with moderate reductions in all dental outcomes from the pre-integration to the post-integration period:

- **Access to dental services decreased moderately.** The percentage of members with a visit for any dental procedure in a calendar quarter decreased by 0.6 percentage points compared with a rate of 18.3 percent in the pre-integration period.
- **Utilization of dental services decreased moderately.** The number of visits for any dental procedure in a calendar quarter decreased by 28.9 per 1,000 members compared to a rate of 267.8 visits per 1,000 members in the pre-integration period.
- **Emergency department (ED) visits for non-traumatic dental conditions decreased moderately.** The number of ED visits for non-traumatic dental conditions in a calendar quarter decreased by 0.2 visits per 1,000 members compared with a rate of 2.2 visits per 1,000 members in the pre-integration period.

- **Despite increased application of dental sealants in 2015, the percentage of children who received sealants decreased moderately between the pre-integration and post-integration periods.** The dental sealant rate increased in 2015, with a sharp increase in the last quarter. This most likely resulted from adoption of dental sealants as a CCO incentive measure. Despite this increase, the average sealant rate decreased by 0.3 percentage points compared to a rate of 4 percent in the pre-integration period. For evaluation purposes, we calculated this measure differently than OHA's CCO incentive measure: We calculated the measure *quarterly* for sealants on any teeth, while OHA calculates its measure *annually* for sealants on permanent molars.

Percentage of children ages 6 - 14 who received dental sealants



- **Spending on dental services decreased moderately.** Average spending on dental services decreased by \$2.54 per enrolled member per quarter compared with average spending of \$23.30 per enrolled member per quarter in the pre-integration period.

The following factors may explain these results:

- **CCOs may need additional time to integrate dental care into the delivery system.** This report reflects dental outcomes in the year and a half after integration of funding for dental services into CCOs' global budgets. CCOs may need additional time to integrate dental care into the delivery system in order to noticeably improve outcomes.
- **CCOs may be focused on priorities other than dental integration.** Faced with multiple priorities and limited capacity, CCOs may have chosen to focus on reforms other than dental integration in the three years following launch.
- **New Medicaid members may have "crowded out" other members.** Integration of funding for dental services into CCOs' global budgets occurred contemporaneously with expansion of Oregon's Medicaid program. New members who used Medicaid dental benefits may have reduced the overall availability of appointments with dental care providers.

OHA should continue to evaluate dental integration by monitoring dental outcomes, analyzing outcomes for different groups of Medicaid members, and assessing differences in dental integration among CCOs.

Introduction

The Importance of Dental Integration

Dental health is linked to overall physical health and health care costs. For example, gum disease has been associated with adverse pregnancy outcomes, respiratory disease, cardiovascular disease, and diabetes. Poor oral health may be associated with chronic pain, lost school days, and inappropriate use of the emergency department (ED).¹ In Oregon, recent research identified ED visits for non-traumatic dental problems as a significant and costly public health problem for low-income, socioeconomically vulnerable people.² More broadly, oral health affects speech, nutrition, growth and function, social development, and quality of life.¹

Despite the link between dental health and overall health, dental and medical services have traditionally been delivered by separate systems. Outside some public and community health centers, dentists rarely interact with primary care physicians and other health care providers. The traditional divide between medical and dental care “has essentially separated the mouth from the rest of the body.”³

Federal authorities, researchers, and practitioners have recommended closer integration of dental care with other health care. In a 2011 report for the federal Health Resources and Services Administration and the California Health Foundation, the Institutes of Medicine concluded that separation of oral health care from overall health care contributes to limited access to oral health care for many Americans and advocated for providing oral health services in variety of settings.¹ A 2012 convention of grantmakers, researchers, and practitioners concluded that integration of primary care and dental care could improve access to dental care, reduce avoidable dental conditions, and provide significant cost savings to the health care system.³ A 2014 editorial in the *New England Journal of Medicine* called for a national effort to integrate oral health care and medical care, particularly at the primary care level.⁴

A variety of models exist for integrating dental care and other health care^{3,5}:

- **Financial integration:** Health care payment systems could be designed to give medical and dental providers a financial stake in patients’ overall health outcomes. At a basic level, this could include reimbursing medical providers for providing basic dental services. At a more advanced level, this could include paying provider organizations one global budget that covers all medical and dental care for a group of patients. It could also include paying bonus payments to provider organizations for achieving dental quality goals. Financial integration could support other forms of dental integration described below.
- **Cross-provision of services:** Physicians and other health care providers could screen patients for dental problems and provide basic dental services, such as fluoride varnish. Similarly, dentists and other dental care providers could screen patients for general health issues. Cross-provision of services could improve access to dental services, since many patients visit health care providers more frequently than dental providers. It could also increase the likelihood that dental and medical problems are detected early and prevented from worsening.
- **Co-location and consultation:** Dental providers and health care providers could work from the same location, improving communication and patient referrals between providers. This model could be enhanced with regular consultation to coordinate medical and dental care, and with virtual integration, in which dentists consult and assist with treatment remotely. Co-location and consultation could help ensure that patients receive needed dental and medical services as soon

as problems are detected.

- **Enhanced communication and referral:** Systems for patient referrals, patient tracking, and follow-up between medical and dental providers could be implemented or enhanced. This could be achieved through health information technology, such as electronic health records that medical and dental providers can view and edit. Like colocation and consultation, enhanced communication and referral could help ensure that dental and medical providers have pertinent information about patients, and that patients receive needed services.

Such models could improve access to dental services; reduce avoidable health care problems, such as chronic pain, adverse pregnancy outcomes, and a range of chronic diseases linked to dental conditions; and reduce spending on costly dental and other health care services, including ED visits for non-traumatic dental problems.

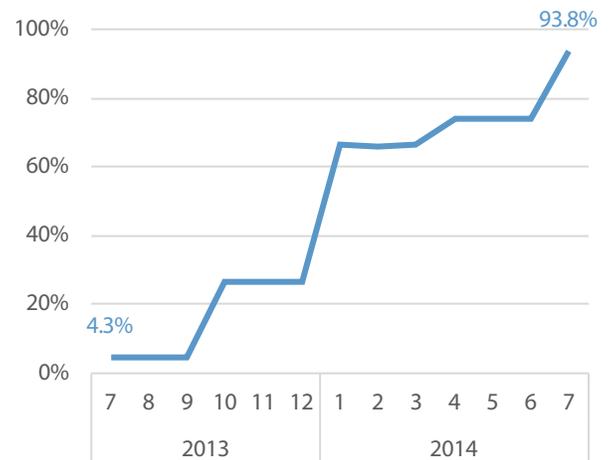
Dental Integration and Oregon's Medicaid Transformation

In 2012, Oregon launched coordinated care organizations (CCOs) to manage physical, behavioral, and dental health benefits for Medicaid members. CCOs are geographically defined organizations governed by health care providers, Medicaid beneficiaries, and community representatives. They represent a single point of accountability for quality of health care and access to care for their members.

Oregon's effort to transform health care delivery for Medicaid members includes integration of funding for dental services and financial incentives for achieving dental quality goals:

- **CCOs' global budgets include funding for dental services:** CCOs receive a per capita global budget that includes funding for physical, behavioral, and dental services. State legislation required CCOs to contract with dental care organizations (DCOs) to manage dental benefits beginning July 1, 2014.⁶ Most CCOs started contracting with DCOs earlier: Three CCOs began in July 2013 and 11 more CCOs began in January 2014. The share of Medicaid members with dental coverage who received dental coverage through a CCO increased from four percent in July 2013 to 94 percent in July 2014 (Figure 1). A small percentage of Medicaid members continue to receive dental coverage through managed care contracts with DCOs or on a fee-for-service basis, meaning that providers bill the State directly for services rendered.⁷
- **CCO incentive measures include two dental quality measures:** CCOs may receive bonus payments from a quality pool for their performance on measures of health care quality and access, called incentive measures. In 2014, OHA adopted two dental quality measures as incentive measures: Mental, Physical, and Dental Health Assessments within 60 Days for Children in Department of Human Services Custody and Dental Sealants on Permanent Molars for Children Ages 6 – 14. Beginning in 2015, CCOs' performance on these measures began to affect bonus payments they received from the quality pool.

Figure 1: Percentage of Medicaid members with dental coverage who received dental coverage through a CCO, July 2013 - July 2014



Source: Oregon Health Authority

Contracting between CCOs and DCOs

There are nine dental care organizations (DCOs) in Oregon. DCOs work with individual dentists and other dental care providers in different ways: Some use a staff model, in which they employ individual providers and pay them a salary, while others contract with individual providers.

Before the launch of CCOs, OHA contracted directly with DCOs to provide dental coverage for Medicaid members. Under these contracts, DCOs functioned as managed care organizations and dental provider organizations. They had specific care management responsibilities, including case management, outreach, and communication with Medicaid members whom they covered.

State legislation required CCOs to contract with any DCOs in the CCOs' service area starting July 1, 2014.⁶ This provision was meant to ensure continuity of dental care for Medicaid members whose physical and dental health care would be covered by CCOs. CCOs may contract with DCOs as provider organizations or continue to delegate care management functions to DCOs; however, CCOs are ultimately accountable to OHA for the dental care members receive.

OHA continues to contract directly with DCOs to provide dental coverage for some Medicaid members, such as members whose physical health care is paid for on a fee-for-service basis (not covered by a CCO).

Dental Coverage and the Affordable Care Act

Integration of funding for dental services into CCOs' global budgets occurred contemporaneously with Medicaid expansion under the Affordable Care Act (ACA). Starting in January 2014, Oregon expanded eligibility for Medicaid under the ACA. Medicaid enrollment increased by almost 436,000 members between January 2014 and June 2015.⁸

As part of Medicaid expansion, Oregon extended comprehensive dental benefits to new Medicaid members and some previously enrolled Medicaid members. Before expansion, Oregon's Medicaid program included two benefit packages: OHP Plus, available to people categorically eligible for Medicaid, such as children and pregnant women; and OHP Standard, comprising adults not eligible for OHP Plus. OHP Plus covered a more comprehensive set of dental services than OHP Standard, which covered only emergency dental services. Under Medicaid expansion, Oregon moved OHP Standard members into new ACA beneficiary groups. Oregon provided OHP Plus benefits to the new beneficiary groups, which included former OHP Standard members and newly eligible Medicaid members. As a result, all Medicaid members had relatively comprehensive dental benefits starting in January 2014.

The influx of new Medicaid members and the expansion of dental benefits for former OHP Standard members in 2014 may have affected the use of dental services and spending on dental care for the Medicaid population as a whole. For example, if new Medicaid members tended to use dental services more or less frequently than previously enrolled members, then Medicaid expansion may have resulted in increased or decreased use of dental services for Medicaid members overall. Similarly, providing former OHP Standard members with more comprehensive dental benefits may have incentivized them to use more dental services, increasing the use of services by Medicaid members overall. Since Medicaid expansion occurred at the same time as integration of funding for dental services into CCOs' global budgets—with CCOs ramping up dental coverage from July 2013 through June 2014—subsequent changes in the use of dental services may have been attributable to the ACA and unrelated to financial integration. As a result, the ACA presents a challenge for evaluating the effects of dental integration in Oregon.

Financial Integration and Delivery System Integration

Integration of funding for dental services into CCOs' global budgets and the addition of dental quality measures to the CCO incentive measures may support integration of dental care into the health care delivery system. For example, they may encourage CCOs to work with providers on making preventive dental services available in primary care clinics, or on increasing coordination between medical and dental providers, to improve access to dental services and reduce ED visits for avoidable dental conditions. This could reduce CCO spending on ED care, freeing funding in CCOs' global budgets for other uses.

CCOs have flexibility to integrate dental care into the delivery system according to local needs and priorities. Under its federal Medicaid waiver, Oregon committed to integrate physical, behavioral, and dental health care in the delivery system in order to generate savings and quality improvements.⁹ Accordingly, OHA requires CCOs to submit a transformation plan that describes activities they will undertake to integrate physical, behavioral, and dental health care. However, OHA does not prescribe how CCOs will accomplish delivery system integration.

Anecdotal evidence indicates CCOs have started work on integrating dental care into the delivery system. As of mid-2016, OHA reported that eight CCOs included specific oral health strategies in their transformation plans.⁷ OHA also reports that CCOs have several dental integration pilot projects underway. These include diverting members from the emergency room through early intervention and dental care, integrating dental hygienists into primary care settings, providing enhanced dental services to members with diabetes, and increasing the use of teledentistry.¹⁰ One CCO reported plans to place care coordinators in dental offices and integrate dental health into its care planning software.¹¹

About this Report

This report evaluates the effect of financial integration on access to dental care, use of dental services, measures of dental quality, and spending on dental care. We compare these outcomes before and after the integration of funding for dental services into CCOs' global budgets. The next section describes our methodology for evaluating this policy change.

Methodology

Dental Outcomes

To evaluate the integration of funding for dental services into CCO's global budgets, we compared the following outcomes before and after July 1, 2014, when all CCOs were required to provide dental coverage:

- 1 Access to dental services:** Percentage of Medicaid members with at least one visit for a dental procedure in a calendar quarter. As described above, integration may increase access to dental services through delivery system changes such as cross-provision of services, co-location, and enhanced referrals. This outcome was calculated separately for any dental procedure, and for 14 “core” procedures listed in Table A2 (appendix).
- 2 Utilization of dental services:** Number of visits for dental procedures per 1,000 Medicaid members in a calendar quarter. By increasing access to dental services and helping ensure that patients receive needed dental services when problems are detected, integration may increase utilization of dental services. Like access to dental services, this outcome was calculated separately for any dental procedure and core procedures.
- 3 Application of dental sealants:** Percentage of children ages 6 to 14 who received dental sealants on permanent molars in a calendar quarter. Adoption of a CCO incentive measure for dental sealants may have increased the use of dental sealants starting in 2015. For evaluation purposes, we calculated this measure differently than OHA's dental sealants measure: We calculated the measure *quarterly* for sealants on any teeth, while OHA calculates its measure *annually* for sealants on permanent molars.
- 4 ED visits for non-traumatic dental conditions:** Number of ED visits for non-traumatic dental conditions per 1,000 Medicaid members in a calendar quarter. Integration may reduce such ED visits by increasing access to preventive dental services and improving coordination between medical and dental providers. The last quarter of 2015 was excluded from analysis due to a coding change that may have affected data completeness.
- 5 Spending on dental services:** Average spending on dental services, including ED visits for non-traumatic dental conditions, in a calendar quarter. The effect of integration on spending is difficult to predict: On one hand, increased access and utilization may result in increased spending. On the other hand, expected reductions in ED visits for dental conditions may reduce overall spending, even if utilization of lower-cost services increases.

Time Periods

We compared outcomes in two time periods:

- **Pre-integration period:** January 2012 – June 2013
- **Post-integration period:** July 2014 – December 2015

We excluded July 2013 – June 2014 from the analysis, as this was a transition period when CCOs were ramping up dental coverage.

In addition to comparing the entire pre-integration and post-integration periods, we split the post-integration period into three 6-month periods and compared the pre-integration period with each 6-month period. This step captured changes in the effect of integration over time.

Data and Population

We included data from members enrolled in Medicaid for at least 9 of 12 months in calendar years 2013, 2014, and 2015. This means members who gained Medicaid coverage as a result of Medicaid expansion in 2014 were excluded from the analysis. These members may have different characteristics than previously enrolled Medicaid members, and may use dental services differently. Excluding them from the analysis can help distinguish the effects of dental integration from the effects of Medicaid expansion, which occurred at the same time.

We excluded former OHP Standard members from the analysis. As described above, these members gained relatively comprehensive dental benefits in 2014, which may have incentivized them to use more dental services. Excluding OHP Standard members from the analysis can help to distinguish the effects of dental integration from the effects of other policy changes.

We used Medicaid enrollment, dental claims, and medical claims data from OHA's Health Systems Division to compare outcomes for members included in the study. These data contain information about dental and medical procedures that Medicaid members received. As described above, dental integration may include delivery of basic dental services by physicians and other health care providers. As a result, we included dental procedures delivered by health care providers, and spending on those procedures, in the analysis.

Statistical Analysis

We used regression analysis to control for factors aside from dental integration that may affect dental outcomes. These include a member's age, gender, race, county of residence, and health status. Results can be interpreted as the effect of integration on the "average" member, controlling for other observable factors.

The next section presents trends in dental outcomes from 2012 through 2015 and results from the statistical analysis.

Results

Trends in Dental Outcomes

To provide an overall picture of outcomes before and after integration of funding for dental services into CCOs' global budgets, we present outcomes graphically without controlling for other factors. We then present estimates for the effect of this policy change using regression analysis to control for member characteristics and calendar quarter.

Figure 2 shows the five outcome measures by calendar quarter from 2012 through 2015. See Table A3 (appendix) for data shown in Figure 2.

Generally, unadjusted outcomes for all measures decreased from the pre-integration to the post-integration period:

- **Overall, measures of access, utilization, and spending decreased moderately from the pre-integration to the post-integration period.** This may reflect regional and national trends toward lower use of health care services over the same time period.
- **The percentage of children who received sealants decreased moderately from 2012 through 2014 and increased in 2015, with a sharp increase in the last quarter.** This most likely resulted from adoption of dental sealants as a CCO incentive measure beginning in 2015.
- **The rate of ED visits for non-traumatic dental conditions decreased notably through 2012 and the first quarter of 2013, then remained relatively flat through 2015.** Like broader measures of utilization described above, this may reflect regional and national trends toward lower ED use over the same time period.

Figure 2: Quarterly Dental Outcome Measures

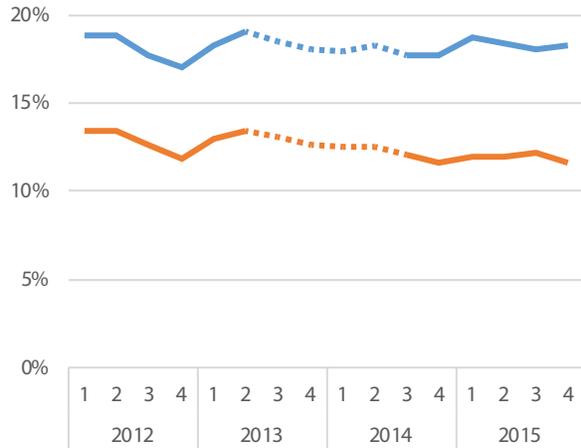
This page shows five outcome measures used to evaluate dental integration. The measures include data for all Medicaid members who were enrolled at least 9 of 12 months in the years 2013, 2014, and 2015, excluding former OHP Standard members. They are unadjusted for member characteristics.

The period from July 2013 through June 2014 (indicated by dotted lines) was a transition period when CCOs were ramping up contracting with dental care organizations.

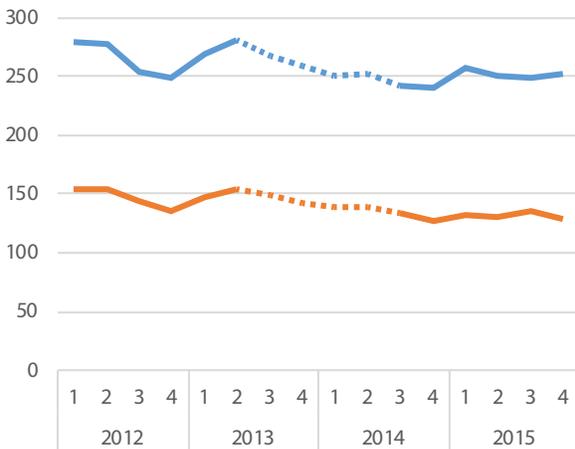
For Measure 4, the last quarter of 2015 was excluded from analysis due to a coding change that may have affected data completeness.

See appendix for measure definitions and data.

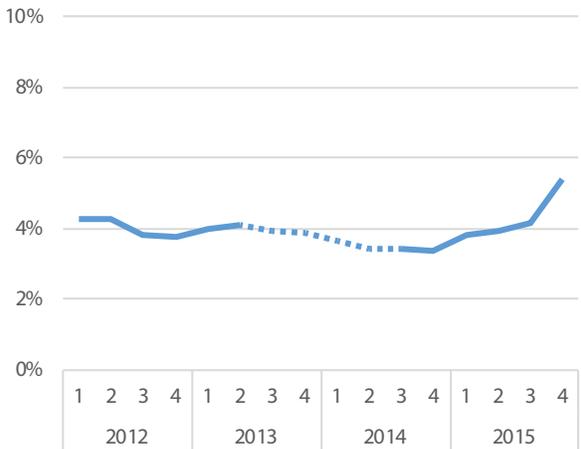
1. Percentage of members with at least one visit for any dental procedure and core dental procedures



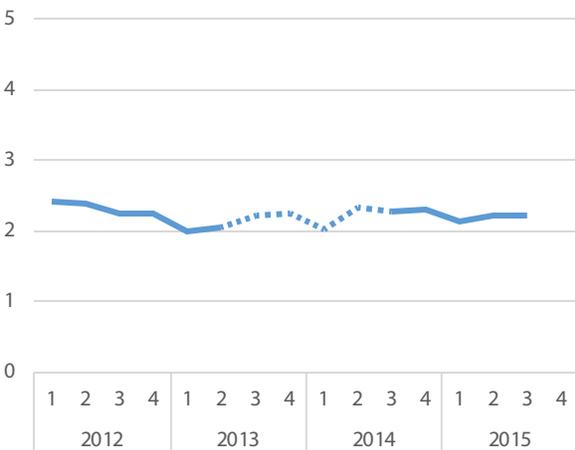
2. Number of visits for any dental procedure and core dental procedures per 1,000 members



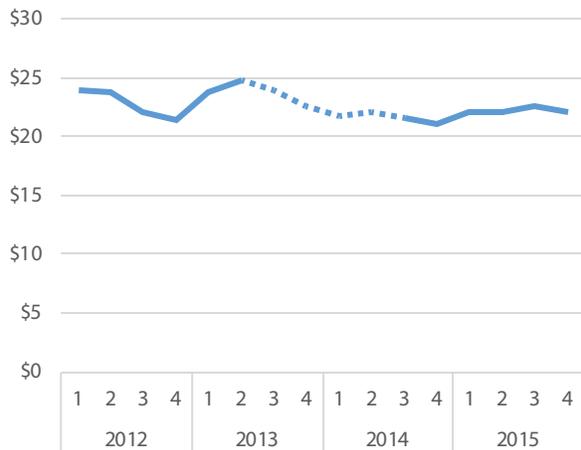
3. Percentage of children ages 6 - 14 who received dental sealants



4. Number of ED visits for non-traumatic dental conditions per 1,000 members



5. Spending on dental services per member



Results from Statistical Analysis

Table 1 presents average outcomes in the pre-integration and post-integration periods, the change between periods unadjusted for observable factors, and the change adjusted for observable factors using regression analysis. Table A4 (appendix) presents change between the pre-integration period and each 6-month period within the post-integration period. Statistically significant changes are shown in **bold**.

TABLE 1: QUARTERLY DENTAL OUTCOMES BEFORE AND AFTER DENTAL INTEGRATION*

Quarterly outcome	Pre-integration	Post-integration	Change, unadjusted	Change, adjusted
Access to dental services: percentage of members with a visit for <i>any</i> procedure	18.3%	18.2%	-0.1%	-0.6%
Access to dental services: percentage of members with a visit for <i>core</i> procedures	13.0%	11.9%	-1.0%	-1.4%
Utilization of dental services: visits for <i>any</i> procedure per 1,000 members	267.8	248.0	-19.7	-28.9
Utilization of dental services: visits for <i>core</i> procedures per 1,000 members	147.9	131.2	-16.7	-20.8
Application of dental sealants: percentage of children 6 – 14 who received sealants	4.0%	4.0%	0.0	-0.3%
ED visits for non-traumatic dental conditions per 1,000 members†	2.2	2.1	-0.1	-0.2
Spending on dental services per member (including members with no dental services)	\$23.30	\$21.89	-\$1.41	-\$2.54

* Statistically significant changes at P<0.05 in **bold**.

† Excludes the last quarter of 2015 due to a coding change that may have affected data completeness.

Regression analysis controlled for the effect of age on outcomes. Members included in the analysis were significantly older in the post-integration period than in the pre-integration period because the same group of members was included in both periods. Age was associated with more frequent use of dental services and higher dental spending, likely because children comprised the majority of members in the analysis and used services more frequently as they aged.

Integration of funding for dental services into CCOs' global budgets was associated with moderate reductions in all dental outcomes compared to the pre-integration period. Result were not substantially different when the post-integration period was split into three 6-month periods.

- **Access to dental services decreased slightly.** Controlling for observable factors, the share of members with a visit for any procedure and core procedures decreased by 0.6 percentage points and 1.4 percentage points, respectively. This represents a 3-percent reduction compared to a rate of 18.3 percent for access to any procedure in the pre-integration period, and an 11-percent reduction compared to a rate of 13.0 percent for access to core procedures in the pre-integration period.
- **Visits for any procedure and core procedures decreased moderately.** Controlling for observable factors, visits for any procedure and core procedures decreased by 28.9 per 1,000 members and 20.8 per 1,000 members, respectively. This represents an 11-percent reduction compared to a rate of 267.8 visits per 1,000 members for any procedure in the pre-integration period, and a 14-percent reduction compared to a rate of 147.9 visits per 1,000 members for core procedures in the pre-integration period.
- **Despite increased application of dental sealants in 2015, the percentage of children who received sealants decreased moderately.** Controlling for observable factors, the percentage of children

who received sealants decreased by 0.3 percentage points. This represents a 7-percent decrease compared to a rate of 4.0 percent in the pre-integration period. While the last 6 months of the post-integration period had a higher sealant rate than the pre-integration period, the first 12 months of the post-integration period had a slightly lower rate than the pre-integration period.

- **ED visits for non-traumatic dental conditions decreased moderately.** ED visits for non-traumatic dental conditions decreased by 0.2 visits per 1,000 members. This represents a 9-percent decrease compared with a rate of 2.2 visits per 1,000 members in the pre-integration period. The graph of unadjusted rates indicates that a downward trend in ED visits for non-traumatic dental conditions began before integration.
- **Spending on dental services decreased moderately.** Average spending on dental services decreased by \$2.54 per enrolled member. This represents an 11-percent reduction compared to average spending of \$23.30 per enrolled member in the pre-integration period.

The last section describes factors that may explain results from the analysis and possible next steps for evaluating dental integration in Oregon's Medicaid program.

Discussion

Explaining the Results

The integration of funding for dental services into CCOs' global budgets was associated with reductions in access, utilization, application of dental sealants, ED visits for non-traumatic dental conditions, and spending on dental services. Although ED visits for non-traumatic dental conditions decreased from the pre-integration to the post-integration period, the downward trend in ED visits for non-traumatic dental conditions appears to have preceded dental integration.

The following factors may explain these results:

- **CCOs may need additional time to integrate dental care into the delivery system.** This report reflects dental outcomes in the 18 months after financial integration. Financial integration may support the integration of dental care into the health care delivery system by giving one organization a financial stake in patient's physical and dental health. However, delivery system integration may require more time than financial integration, which involves changes in policies and payment systems: It may involve training physicians to provide basic dental services; hiring new personnel, such as dental therapists and care managers, and integrating them into clinic workflows and medical teams; and investing in new technologies, such as telehealth and integrated electronic health records. While some CCOs may have initiated dental integration pilot projects, they may need more time to bring these pilots to a scale that noticeably improves outcomes.
- **CCOs may be focused on priorities other than dental integration.** CCOs face multiple priorities under Oregon's Medicaid waiver. These include improving care coordination by supporting patient-centered primary care homes and health information technology, implementing alternative payment systems, integrating behavioral health care into the delivery system, providing health-related flexible services, and meeting performance goals on a wide variety of incentive measures. Faced with limited capacity, CCOs may have chosen to focus on reforms other than dental integration in the three years following launch.
- **New Medicaid members may have "crowded out" other members.** Medicaid enrollment increased by 436,000 between January 2014 and June 2015, a 71-percent increase since 2013.⁸ New Medicaid members and former OHP members gained relatively comprehensive dental benefits as a result of Medicaid expansion. New members who used these benefits to access dental care may have reduced the overall availability of appointments with dental care providers, "crowding out" other Medicaid members and contributing to reduced access and utilization.

Next Steps for Evaluating Dental Integration

OHA should continue to evaluate dental integration in Oregon's Medicaid program. The following steps could be used to extend the evaluation presented in this report:

- **Continue to monitor dental outcomes.** Outcomes may improve relative to the pre-integration period as CCOs integrate dental care into the delivery system level and scale up pilot projects.
- **Refine the evaluation by analyzing outcomes for different groups of Medicaid members.** Our analysis included a small number of members who receive dental coverage through a DCO or on a fee-for-service basis. Their physical health and dental care may be less integrated than care for members who receive physical health and dental benefits through a CCO. Evaluating outcomes

for different groups of members was outside the scope of this report, but may help to refine results.

- **Assess differences in dental integration and outcomes among CCOs with different levels of dental integration.** The extent of dental integration may differ across CCOs. Future analyses could identify indicators of dental integration in the delivery system, compare dental outcomes among CCOs, and analyze the relationship between the level of delivery system integration and outcomes. Indicators might include counts of dental services delivered by health care providers or implementation of integration projects as reported in surveys.

Appendix

Data

We used Medicaid enrollment, dental claims, and medical claims files from OHA’s Health Systems Division to compare dental outcomes in the pre-integration and post-integration periods. These files contain information about the medical diagnoses and procedures of Medicaid members, as well as demographic information used as controls for statistical analysis. We used claims from the dental and medical claims files to calculate measures of access, utilization, and application of dental sealants; claims from the medical claims file to calculate ED visits for non-traumatic dental conditions; and spending on dental procedures and ED visits for non-traumatic dental conditions from both files to calculate spending on dental procedures (see Dental Outcomes below).

Population

We included members enrolled in Medicaid for at least 9 of 12 months in calendar years 2013, 2014, and 2015. We excluded former OHP Standard members, as identified by PERC codes on the enrollment file. The number of unique people included in the analysis ranged from 364,195 in the first quarter of 2012 to 433,554 in the second quarter of 2014.

Data available in the Medicaid enrollment file suggests that most characteristics of the study population did not change substantially over time. Table A1 shows average characteristics of the population in the pre-integration and post-integration periods. Only age changed substantially, since the population aged over the study period. Our regression analysis controlled for the effect of age and other observable characteristics (see Statistical Analysis below).

TABLE A1: STUDY POPULATION DEMOGRAPHICS

Characteristic	Pre-integration	Post-integration
Average age	23	25
Percentage female	53.9%	54.0%
Percentage white	86.6%	86.7%
Percentage Asian or Pacific Islander	4.1%	4.1%
Percentage black or African American	5.2%	5.2%
Percentage American Indian or Alaska Native	2.6%	2.6%
Percentage children	63.5%	57.8%
Percentage residing in a rural zip code	40.2%	40.4%

Dental Outcomes

We calculated the following outcomes for each dental member in each calendar quarter from 2012 through 2015.

1 Access to dental services: Whether a member had at least one visit for a dental procedure in a calendar quarter. We calculated this outcome in two ways:

Visits for any procedure: Whether a member had a visit for any procedure with a procedure code from D0100 to D0999.

Visits for “core” procedures: Whether a member had a visit for any of 14 common dental procedures listed in Table A2.

2 Utilization of dental services: Number of visits for dental procedures in a calendar quarter. Like access to dental services, we calculated this outcome for any dental procedure and procedures listed in Table A2.

3 Application of dental sealants: Whether a member age 6 to 14 had at least one visit with procedure code D1351 in a calendar quarter. For evaluation purposes, we calculated this measure differently than OHA’s dental sealants measure: We calculated the measure *quarterly* for sealants on any teeth, while OHA calculates the CCO incentive measure *annually* for sealants on permanent molars.

4 ED visits for non-traumatic dental conditions: Number of ED visits in a calendar quarter with the following primary discharge diagnosis codes in a calendar quarter: 520.0-520.9, 521.0-521.9, 522.0-522.9, 523.0-523.9, 525.0-525.9, 526.4, 526.5, 526.61-526.69, and 528.3. These codes were drawn from a recent study of ED visits for non-traumatic dental conditions in Oregon,² and from the measure specifications from the Dental Quality Alliance.¹²

We excluded the last quarter of 2015 from the analysis. In October 2015, the federal government required health care payers and providers to switch from ICD-9 to ICD-10 codes for billing and payment. The coding change appears to have substantially affected the rate for the last quarter of 2015 that we calculated for this measure. We observed a 40-percent drop in ED visits for non-traumatic dental conditions from the third quarter of 2015 to the fourth quarter of 2015.

5 Spending on dental services: Spending on dental services in a calendar quarter. This included two components: Spending on dental procedures and spending on ED visits for non-traumatic dental conditions.

Spending on dental procedures: Spending on any dental procedures recorded in the dental or medical claims file. We used amounts paid for dental procedures by Oregon’s fee-for-service (FFS) program (not payment amounts on dental claims) to calculate this outcome. Most dental services are paid for using sub-capitation. In this payment system, CCOs make per-capita payments to dental care organizations covering all dental services for a group of patients; the dental care organizations, in turn, pay individual providers for services rendered. As a result, most dental claims have no payment amount because a CCO did not pay the provider for services on the basis of a claim. To evaluate spending on dental services, we used amounts paid for dental services by Oregon’s FFS program, which pays for services for some Medicaid members based on claims.

Spending on ED visits for non-traumatic dental conditions: Like spending on dental procedures, we calculated spending on ED visits for non-traumatic dental conditions using FFS amounts. This outcome excludes prescription drug spending that may have resulted from ED visits because pharmacy claims were not included in the analysis. A recent study of ED visits for non-traumatic dental conditions in Oregon indicated ED dental visitors often use the

TABLE A2: CORE DENTAL PROCEDURES

Procedure	Code
Periodic oral exam	D0120
Comprehensive oral exam	D0150
Complete X-rays	D0210
Bitewing X-rays	D0272
Panoramic X-rays	D0330
Child prophylaxis	D1120
Application of topical fluoride	D1203
Anterior tooth resin	D2331
Permanent tooth amalgam	D2150
Porcelain crown	D2751
Prefabricated steel crown	D2930
Therapeutic pulpotomy	D3220
Root canal	D3310
Extraction	D7110

ED to manage dental pain,² suggesting that prescription pain medication may be a substantial cost associated with such ED visits. As a result, spending on dental services used in this study may underestimate total spending associated with ED visits for non-traumatic dental conditions.

Table A3 shows rates for each measure without adjustment for observable characteristics.

TABLE A3: UNADJUSTED RATES FOR DENTAL OUTCOMES

Year	Quarter	Percentage of members with at least one visit for a dental procedure		Number of visits for a dental procedure per 1,000 members		Percentage of children age 6-14 who received sealants	Number of ED visits for non-traumatic dental conditions per 1,000 members*	Spending on dental services per enrolled member
		Any	Core	Any	Core			
2012	1	18.9%	13.4%	278.5	153.9	4.3%	2.4	\$23.91
	2	18.8%	13.4%	277.0	153.3	4.3%	2.4	\$23.85
	3	17.7%	12.7%	254.0	143.2	3.8%	2.2	\$22.06
	4	17.1%	11.9%	248.0	135.5	3.8%	2.3	\$21.40
2013	1	18.3%	13.0%	268.9	147.8	4.0%	2.0	\$23.72
	2	19.1%	13.5%	280.8	154.3	4.1%	2.0	\$24.81
	3	18.5%	13.1%	266.8	148.4	3.9%	2.2	\$23.91
	4	18.0%	12.6%	259.2	142.7	3.8%	2.2	\$22.66
2014	1	17.9%	12.5%	250.1	139.5	3.6%	2.0	\$21.69
	2	18.3%	12.5%	251.3	139.3	3.4%	2.3	\$22.07
	3	17.8%	12.1%	241.5	133.5	3.4%	2.3	\$21.51
	4	17.7%	11.6%	239.6	127.8	3.4%	2.3	\$21.03
2015	1	18.7%	12.0%	256.6	132.3	3.8%	2.1	\$22.03
	2	18.4%	11.9%	249.7	130.9	3.9%	2.2	\$22.12
	3	18.1%	12.2%	248.4	134.6	4.1%	2.2	\$22.54
	4	18.3%	11.6%	252.5	128.1	5.4%	-	\$22.10

* The final quarter of 2015 is excluded due to the switch from ICD-9 to ICD-10 codes for billing and payment.

Statistical Analysis

We used two regression models to evaluate changes in outcomes between the pre-integration and post-integration periods.

Model 1: The first model compares outcomes in a single pre-integration and post-integration period:

$$Y_{it} = f(b_0 + b_1 * PostIntegration_t + a * X_{it} + e_{it})$$

Y_{it} is the outcome of interest for member i in quarter t . For access, application of dental sealants, and ED visits for non-traumatic dental conditions, $Y_{it} = 1$ if a member had at least one visit and 0 if the member did not have a visit. For utilization and spending, Y_{it} = number of visits or dollars spent on dental services, respectively. f is a general function representing the relationship between the outcome Y and the independent variables. $PostIntegration_t = 1$ if the observation occurs in the post-integration period (July 1, 2014 to December 31, 2015) and 0 otherwise. X_{it} is a vector of demographic covariates, including age, gender, race, rural residence, and comorbidities as defined by the Chronic Illness and Disability Payment System (CDPS) risk adjustment methodology. Age was adjusted using continuous linear and squared terms within age categories. The coefficient b_1 is

the primary coefficient of interest: it represents change in the outcome associated with the post-integration period, controlling for observable factors.

Model 2: The second model splits the post-integration period into three 6-month periods and compares the pre-integration period with each 6-month period. This step captures changes in the effect of integration over time.

$$Y_{it} = f(b_0 + b_1 * Post1_t + b_2 * Post2_t + b_3 * Post3_t + a * X_{it} + e_{it})$$

$Post1_t = 1$ if an observation occurs in the first post-integration period (July 1, 2014 – December 31, 2014) and 0 otherwise; $Post2_t = 1$ if an observation occurs in the second post-integration period (January 1, 2015 – June 30, 2015) and 0 otherwise; and $Post3_t = 1$ if an observation occurs in the third post-integration period (July 1, 2015 – December 31, 2015) and 0 otherwise.

We used linear regression models for the results presented in this report. In addition, we estimated the models using logistic regression models for binary outcomes (i.e., access and application of dental sealants), two-part models for continuous outcomes (i.e., spending), and negative binomial models for count variables (i.e., utilization and ED visits for non-traumatic dental conditions). Results were not substantially different using these alternative specifications.

Table 1 presents results for Model 1. Table A4 presents results for Model 2. Results were not substantially different when the post-integration period was split into three 6-month periods.

TABLE A4: EFFECT OF DENTAL INTEGRATION IN THREE POST-INTEGRATION PERIODS*

Quarterly outcome	Post-integration 1 (Jul 2014 – Dec 2014)	Post-integration 2 (Jan 2015 – Jun 2015)	Post-integration 3 (Jul 2015 – Dec 2015)
Access to dental services: percentage of members with a visit for any procedure	-0.4%	-0.8%	-0.1%
Access to dental services: percentage of members with a visit for core procedures	-0.9%	-1.8%	-0.9%
Utilization of dental services: visits for any procedure per 1,000 members	-23.1	-34.9	-18.7
Utilization of dental services: visits for core procedures per 1,000 members	-14.8	-26.0	-14.4
Application of dental sealants: percentage of children 6 – 14 who received sealants	-0.4%	-0.3%	0.2%
ED visits for non-traumatic dental conditions per 1,000 members [†]	-0.2	-0.2	-0.3
Spending on dental services per member (including members with no dental services)	-\$1.83	-\$3.33	-\$1.11

* Statistically significant changes at P<0.05 in **bold**.

† Excludes the last quarter of 2015 due to a coding change that may have affected data completeness.

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