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Virginia health advocates are pleased to offer the following, *Estimating the Cost of Introducing Comprehensive Adult Medicaid Dental Benefits in Virginia*, a Virginia-specific report from the American Dental Association's Health Policy Institute.

The Health Policy Institute (HPI) is a trusted national resource concerning key issues related to access to dental care, dental care utilization, and dental benefits. Dr. Marko Vujicic, HPI Chief Economist and Vice President and his team completed the attached analysis and research brief in consultation with the Virginia Department of Medical Assistance Services, using Virginia data where possible and data compiled from other states who have implemented a dental benefit for adults when necessary.

Health care stakeholders, including providers and community members from across Virginia, have overwhelmingly endorsed a budget amendment to fund a comprehensive adult dental benefit. This will ensure all Virginians enrolled in Medicaid have access to oral health care services. Doing so will improve health outcomes, support safety-net clinics, and lower costs for Virginia's government.

The report does not separate costs by general funds and non-general funds. The breakdown for year one and year two are below.

**Year One Costs for an Adult Dental Benefit in Medicaid**

- \$17,486,839 – General Funds
- \$46,803,011 – Non-General Funds

**Year Two Costs for an Adult Dental Benefit in Medicaid**

- \$25,304,935 – General Funds
- \$67,727,915 – Non-General Funds

**For additional questions, contact Virginia Health Catalyst CEO Sarah Bedard Holland at [sholland@vahealthcatalyst.org](mailto:sholland@vahealthcatalyst.org).**

## Research Brief

The Health Policy Institute (HPI) is a thought leader and trusted source for policy knowledge on critical issues affecting the U.S. dental care system. HPI strives to generate, synthesize, and disseminate innovative research for policy makers, oral health advocates, and dental care providers.

### Who We Are

HPI's interdisciplinary team of health economists, statisticians, and analysts has extensive expertise in health systems policy research. HPI staff routinely collaborates with researchers in academia and policy think tanks.

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# Estimating the Cost of Introducing Comprehensive Adult Medicaid Dental Benefits in Virginia

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## Key Findings

- *The estimated total cost of implementing a comprehensive adult dental benefit in Medicaid is \$64.3 million in year one under the most likely scenario. The upper-bound estimate is \$81.5 million. Total costs are estimated to increase in years two and three.*
- *Medical care cost savings associated with improved oral health are anticipated to begin in year two. The estimated savings range from \$5.6 million per year to \$17.6 million.*
- *Under the most likely scenario, and taking into account anticipated medical care cost savings, the per enrollee per month cost of introducing comprehensive adult dental benefits in Medicaid is \$8.00 in year one, rising to \$13.45 by year three.*

## Introduction

Medicaid provides health insurance coverage for some of the nation's most vulnerable populations, including low-income children and adults, pregnant women, seniors and individuals with disabilities.<sup>1</sup> All states are required to comply with the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit,<sup>2</sup> which provides comprehensive and preventive health care services for children under age 21 that are enrolled in Medicaid, including dental care services.

However, there is no corresponding dental care requirement for adult Medicaid beneficiaries. Instead, adult dental benefits are an optional benefit for Medicaid programs. According to the most recent analysis, Virginia is one of 16 states that provide limited adult dental coverage.<sup>3</sup> While comprehensive dental benefits are provided for pregnant women covered by Medicaid, the program covers only emergency extractions for all other adults. There are 19 states that provide comprehensive dental coverage and another 16 that provide either no coverage or emergency dental services only.

Evidence shows that providing adult dental benefits through Medicaid has a significant impact on access to and utilization of dental care among low-income adults.<sup>4</sup> Providing comprehensive dental benefits to Medicaid-enrolled adults has shown to reduce costly emergency department (ED) visits for dental conditions.<sup>5</sup>

Recent analysis suggests that providing dental care to pregnant women, as Virginia does, can lead to cost savings. Furthermore, extending dental coverage to patients with chronic conditions such as diabetes and heart disease can lead to savings in other areas of health care spending.<sup>6,7,8</sup> Thus, investing in a comprehensive dental benefit for Medicaid-enrolled adults will, in the long term, lead to reductions in medical care costs financed by Medicaid. In Virginia, more than one in three low-income adults indicate that the condition of their mouth and teeth affects their ability to interview for a job,<sup>9</sup> suggesting that Medicaid dental coverage could have economic benefits as well.

In this research brief, we estimate the cost of introducing a comprehensive adult dental benefit in the Medicaid program in Virginia. We estimate potential medical care cost savings attributable to a reduction in ED visits for dental conditions and reduced medical care costs among Medicaid beneficiaries with diabetes and coronary artery disease (CAD).

## Results

We model two scenarios, which are outlined in detail in the Data & Methods section. Both scenarios mirror the coverage currently offered to pregnant women and assume average per person spending for adults will be the same as for pregnant women. Scenario 1 is based on average utilization rates across states that provide comprehensive dental coverage for Medicaid-enrolled adults. We feel this is the most likely scenario. Scenario 2 assumes above average utilization and, in

our view, should be interpreted as a high-end, upper-bound estimate.

Our results are summarized in Table 1. The estimated total cost of providing Medicaid adult dental benefits in Virginia under Scenario 1 is \$64.3 million in year one, \$93.0 million in year two, and \$121.8 million in year three. Estimated reductions in spending on dental-related ED visits and medical care costs related to diabetes and CAD are zero in year one, \$5.6 million in year two, and \$13.6 million in year three. Thus, the net additional cost of introducing a comprehensive adult dental benefit in Medicaid is \$64.3 million in year one, \$87.5 million in year two, and \$108.3 million in year three. This translates to a cost of \$8.00, \$10.88, and \$13.45 per enrollee per month for year one, two, and three, respectively.

The estimated total cost of providing Medicaid adult dental benefits in Virginia under Scenario 2 is \$81.5 million in year one, \$121.8 million in year two, and \$167.8 million in year three. Estimated reductions in spending on dental-related ED visits and medical care costs related to diabetes and CAD are zero in year one, \$6.8 million in year two, and \$17.6 million in year three. Thus, the net additional cost of introducing a comprehensive adult dental benefit in Medicaid is \$81.5 million in year one, \$115.0 million in year two, and \$150.1 million in year three. This translates to a cost of \$10.14, \$14.30 and \$18.67 per enrollee per month for year one, two, and three, respectively.

Our analysis estimates total additional costs for the program and does not account for cost sharing under the Federal Medicaid Assistance Program (FMAP).

## Discussion

In this research brief, we estimate the cost of introducing a comprehensive Medicaid adult dental benefit in Virginia. This analysis required making

several key assumptions that, although guided by the best available evidence and data, are still assumptions and subject to uncertainty. Nevertheless, we feel we have incorporated the best available evidence and data to guide our modeling.

This analysis is meant to assist policymakers in Virginia in assessing the fiscal impact of introducing a comprehensive adult dental benefit into the state Medicaid program. The Health Policy Institute is happy to work with policymakers in Virginia on other research initiatives related to the dental care sector.

**Table 1:** Estimated Annual Cost of Adding a Comprehensive Adult Dental Benefit in Medicaid in Virginia

	Scenario 1			Scenario 2		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Medicaid enrollment, adults	670,000	670,000	670,000	670,000	670,000	670,000
Dental care utilization rate, baseline	11.1%	11.1%	11.1%	11.1%	11.1%	11.1%
Dental care utilization rate, post reform	15.0%	20.0%	25.0%	18.0%	25.0%	33.0%
Additional enrollees with a dental visit	26,130	59,630	93,130	46,230	93,130	146,730
Average dental care spending per year per dental patient	\$858	\$858	\$858	\$858	\$858	\$858
Additional costs for new dental patients	\$22,419,540	\$51,162,540	\$79,905,540	\$39,665,340	\$79,905,540	\$125,894,340
Additional costs for existing dental patients	\$41,870,310	\$41,870,310	\$41,870,310	\$41,870,310	\$41,870,310	\$41,870,310
<b>Total additional dental care costs</b>	<b>\$64,289,850</b>	<b>\$93,032,850</b>	<b>\$121,775,850</b>	<b>\$81,535,650</b>	<b>\$121,775,850</b>	<b>\$167,764,650</b>
<b>Per enrollee per month</b>	<b>\$8.00</b>	<b>\$11.57</b>	<b>\$15.15</b>	<b>\$10.14</b>	<b>\$15.15</b>	<b>\$20.87</b>
Estimated reduction in medical care costs for those with...						
Diabetes	\$0	\$2,189,614	\$6,839,467	\$0	\$3,419,734	\$10,775,851
Coronary artery disease	\$0	\$46,798	\$146,177	\$0	\$73,088	\$230,307
Emergency room visit for dental conditions	\$0	\$3,316,776	\$6,633,553	\$0	\$3,316,776	\$6,633,553
<b>Total additional medical care costs savings</b>	<b>\$0</b>	<b>\$5,553,188</b>	<b>\$13,619,197</b>	<b>\$0</b>	<b>\$6,809,598</b>	<b>\$17,639,711</b>
<b>Per enrollee per month</b>	<b>\$0.00</b>	<b>\$0.69</b>	<b>\$1.69</b>	<b>\$0.00</b>	<b>\$0.85</b>	<b>\$2.19</b>
<b>Net total cost of adult dental benefit</b>	<b>\$64,289,850</b>	<b>\$87,479,662</b>	<b>\$108,156,653</b>	<b>\$81,535,650</b>	<b>\$114,966,252</b>	<b>\$150,124,939</b>
<b>Per enrollee per month</b>	<b>\$8.00</b>	<b>\$10.88</b>	<b>\$13.45</b>	<b>\$10.14</b>	<b>\$14.30</b>	<b>\$18.67</b>

Note: See Data & Methods section for detailed methodology, including modeling assumptions. Based on analysis of data from the Health Policy Institute and data provided by the Virginia Department of Medicaid Assistance Services.

## Data & Methods

We worked closely with the Virginia Health Catalyst, who facilitated access to data from the Virginia Department of Medical Assistance Services. We received the data necessary for our analysis in January 2020. The data included Medicaid enrollment, current dental spending, percent of Medicaid enrollees with a dental visit, number of Medicaid enrollees with a dental-related emergency department visit, current emergency department spending for dental care services, and number of Medicaid enrollees diagnosed with diabetes and coronary artery disease.

We previously developed a methodology for estimating the cost of introducing a Medicaid adult dental benefit in a particular state.<sup>10</sup> We modified this methodology to be specific to Virginia and refined predicted dental spending estimates to account for the specific plan design being considered in Virginia. We also accounted for estimated medical care cost savings.

The proposed Medicaid adult dental benefit is very comprehensive, providing preventive and restorative dental care. The proposed dental benefit would mirror what is currently provided to pregnant women enrolled in Medicaid, including having no annual dollar limit, which is very rare.

We first estimated the increase in dental care use resulting from adding a comprehensive adult dental benefit in Medicaid. In 2018, 11 percent of adults enrolled in Medicaid in Virginia received some type of dental care service. Across states that provide comprehensive dental benefits to adults in Medicaid for which we have data, the average dental care use rate is 25 percent,<sup>10</sup> and the highest value is 33 percent (in Minnesota). In Virginia, the Medicaid program provides comprehensive dental coverage for pregnant women, with no dollar limit. In 2018, 14 percent of Medicaid-enrolled pregnant women used dental care services.

Based on these data, we chose two scenarios to model. Scenario 1 assumes that the dental care use rate for Medicaid-enrolled adults in Virginia will be 25 percent once a benefit is introduced, which is the average across states that currently provide comprehensive adult benefits in Medicaid. Scenario 2 assumes the rate will be 33 percent, the highest value based on state experiences.

Next, we estimated dental spending among adult Medicaid enrollees who use dental care services. We had three data sources to draw from. A crude estimate of average annual dental spending per Medicaid-enrolled adult patient across all states with comprehensive adult dental benefits in Medicaid was \$556 in 2012, or \$619 in current 2020 dollars.<sup>10</sup> We also had access to more refined data for a smaller number of states provided directly to us by their Medicaid agencies (Illinois, Minnesota, North Carolina and Wyoming). Adjusting for differences in Medicaid fee schedules in these states compared to Virginia, we calculated an average of \$452 spent per Medicaid-enrolled adult per year who uses dental care services. A third source is the current spending level among pregnant women covered by Medicaid in Virginia, where the average amount spent in 2018 among those with a dental service was \$858. Given that the proposed dental benefit for adults in Virginia is very similar to the current benefit for pregnant women, we chose \$858 for our modeling. We assumed that the 11 percent of adults who currently use dental care services would also spend this amount after the new enhanced dental benefit is introduced. Currently, they spend \$295 per year on average, a significantly lower amount.

We assumed 670,000 adults are enrolled in Medicaid in Virginia, excluding pregnant women enrollees, based on the most recent data.

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In summary, the total additional cost of introducing a comprehensive Medicaid adult dental benefit is estimated using the following formula:

$$\text{New Expenditure} = \text{Enrollment} * \text{Change in Utilization Rate} * \text{Dental Spending per User}$$

We modeled increased dental care costs and offsetting medical care savings over a three-year timeframe. This accounts for the fact that the impact of introducing adult dental coverage in Medicaid is not immediate. Awareness among enrollees takes time, providers need time to adjust, and medical care cost reductions are not seen immediately. Given there is very little research to draw on, we simply assumed that the dental care utilization rate will increase linearly and will reach its “steady state” value by year three.

We assumed no medical care costs savings in year one. We assumed year two will bring half of the expected medical care costs savings, and then in year three the “steady state” level of cost savings will be reached. Again, there is little evidence to draw on, but the best available evidence suggests that medical cost savings start to appear as early as year two,<sup>7</sup> consistent with our assumptions.

In 2018, there were 19,000 dental-related ED visits paid for by Medicaid in Virginia, 64 percent of which were among non-elderly adults. Data on costs were not provided to us, but nationally the average dental-related ED visit costs \$1,091.<sup>11</sup> We used this cost estimate in our modeling.

The available evidence suggests that up to 78 percent of ED visits for dental conditions nationwide could be diverted to a dentist office or other ambulatory setting.<sup>12</sup> A recent study found a 14 percent reduction in dental-related ED visits one year after expanding adult dental benefits via Medicaid expansion under the Affordable Care Act.<sup>13</sup> Data from Missouri shows a 9 percent reduction in dental-related ED visits one year

after introducing dental benefits to adults in Medicaid. By year two, the reduction was 18 percent and by year three it was 63 percent.<sup>14</sup>

Based on these studies, and taking a very conservative approach, our model assumed no reduction in emergency room visits for dental conditions one year after introducing an adult dental benefit in Medicaid, a 25 percent reduction by year two, and a 50 percent reduction by year three.

In 2018, 13.6 percent of adults enrolled in Medicaid in Virginia were diagnosed with diabetes. For our purposes, we defined this as having at least one diabetes-related diagnosis in the year (ICD-10 codes: E11.8, E11.9, E08.42, E09.42, E10.42, E11.42, E13.42, E08.42, E09.42, E10.42, E11.42, E13.42, E08.36, E09.36, E10.36, E11.36, E13.36, H35.9, O24.319). We assumed adults with diabetes will behave similarly in terms of their dental care seeking behavior when a dental benefit for adults is introduced into Medicaid. In other words, their dental care utilization rate will increase by the same amount as adult beneficiaries in general. Based on the available evidence, estimated medical costs would be reduced between \$900<sup>6</sup> to \$2,400<sup>7</sup> per year per patient with diabetes who receive periodontal treatment. We believed the most accurate estimate is toward the lower end of this range. Thus, we assumed a medical care cost reduction of \$900 per year for each new dental patient with diabetes in “steady state.” As noted, in year one we assumed no cost savings, and in year two we assumed half the “steady state” amount.

In 2018, 0.2 percent of adults enrolled in Medicaid in Virginia were diagnosed with some form of coronary artery disease (CAD). For our purposes, we defined this as having at least one CAD-related diagnosis in the year (ICD-10 codes: I24.1, I20.8, I25.10). We assumed patients with CAD will behave similarly in terms of their dental care seeking behavior when a

dental benefit for adults is introduced into Medicaid. In other words, their dental care utilization rate will increase by the same amount as adult beneficiaries in general. The available evidence suggests that medical cost savings among adults with CAD who receive periodontal treatment are \$1,090 per year.<sup>7</sup> As noted, in year one we assumed no cost savings, and in year two we assumed half of this amount, while in year three we assumed the full amount.

We assumed that 60 percent of adult Medicaid enrollees in Virginia have some form of periodontal disease. This estimate is based on the most recent national data on the prevalence of periodontal disease among low-income adults in the United States.<sup>15</sup> We know of no such data source at the state level. We assumed the same periodontal disease prevalence rate for those that visit the dentist and those that do not.

There are numerous limitations to our analysis, which have been outlined in our original modeling work.<sup>10</sup> For example, we assumed some gradual scaling up of dental care utilization, based on our expert opinion as there is little research on this issue. However, there could be pent-up demand for dental care among low-income adults that could produce higher expenditures in early years and a subsequent decline. Medical care cost savings estimates are subject to a high degree of uncertainty. This is partly because the evidence base is still relatively weak on exactly how much medical

costs decline when patients with chronic conditions like diabetes have increased access to dental care. Still, we have taken a very conservative approach to modeling medical care cost savings, taking the lower end of the estimates from the research. We also assumed that Medicaid enrollees with diabetes and cardiovascular disease will use dental care at the same rate as the adult Medicaid-enrolled population.

In addition, the nature of the Medicaid adult dental benefit being proposed in Virginia adds another layer of challenges because there is no state that we know of that has implemented something similar in terms of no annual dollar limit. Thus, experiences from other states that we draw on may be less relevant. We have taken a very conservative approach to ensure that one of our scenarios errs on the side of high dental care costs. We feel this scenario represents an upper bound in terms of the cost of implementing an adult dental benefit in Medicaid.

## Acknowledgments

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## References

- <sup>1</sup> Centers for Medicare & Medicaid Services. Medicaid and CHIP overview. June 2018. Available from: <http://www.medicaid.gov/medicaid-chip-program-information/medicaid-and-chip-program-information.html>. Accessed January 23, 2020.
- <sup>2</sup> Medicaid.Gov. Early and periodic screening, diagnostic, and treatment. Centers for Medicare & Medicaid Services. Available from: <https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/index.html>. Accessed January 23, 2020.
- <sup>3</sup> Center for Health Care Strategies, Inc. Medicaid adult dental benefits: An overview. September 2019. Available from: <https://www.chcs.org/resource/medicaid-adult-dental-benefits-overview/>. Accessed January 23, 2020.
- <sup>4</sup> Choi MK. The impact of Medicaid insurance on dental service use. *J Health Econ*. 2011;30: 1020-1031.
- <sup>5</sup> Singhal A, Caplan D, Jones M, et. Al. Eliminating Medicaid adult dental coverage in California led to increased dental emergency visits and associated costs. *Health Aff*. 2015;34(5): 749-756.
- <sup>6</sup> Nasseh K, Vujicic M, Glick M. The relationship between periodontal interventions and healthcare costs and utilization. *Health Econ*. 2016. doi: 10.1002/hec.3316.
- <sup>7</sup> Jeffcoat MK, Jeffcoat RL, Gladowski PA, et al. Impact of periodontal therapy on periodontal health: Evidence from insurance data for five systemic conditions. *Am J of Prev Med*. 2014;47(2): 166-174.
- <sup>8</sup> Nasseh K, Vujicic M, Romaine D. Diverting emergency department dental visits could save Maryland's Medicaid program \$4 million per year. Health Policy Institute Research Brief. American Dental Association. November 2014. Available from: [http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief\\_1114\\_2.ashx](http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_1114_2.ashx). Accessed January 23, 2020.
- <sup>9</sup> American Dental Association. Virginia's Oral Health and Well-Being. Health Policy Institute Infographic. Available from: <https://www.ada.org/en/science-research/health-policy-institute/oral-health-and-well-being/Virginia-facts>. Accessed January 23, 2020.
- <sup>10</sup> Yarbrough C, Vujicic M, Nasseh K. Estimating the cost of introducing a Medicaid adult dental benefit in 22 states. Health Policy Institute Research Brief. American Dental Association. March 2016. Available from: [http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief\\_0316\\_1.ashx](http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_0316_1.ashx). Accessed July 18, 2016.
- <sup>11</sup> American Dental Association. Emergency department visits for dental conditions – a snapshot. Health Policy Institute Infographic. August 2019. Available from: [https://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIgraphic\\_0819\\_1.pdf?la=en](https://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIgraphic_0819_1.pdf?la=en). Accessed January 23, 2020.
- <sup>12</sup> Wall T, Nasseh K, Vujicic M. Majority of dental-related emergency department visits lack urgency and can be diverted to dental offices. Health Policy Institute Research Brief. American Dental Association. August 2014. Available from: [http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief\\_0814\\_1.ashx](http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_0814_1.ashx)
- <sup>13</sup> Elani HW, Kawachi I, Sommers BD. Changes in emergency department visits after Medicaid expansion. *Health Ser Res*. 2020. doi.org/10.1111/1475-6773.13261.
- <sup>14</sup> Oral Health Progress and Equity Network. Available from: <http://www.oralhealth.network/p/cm/ld/fid=1>. January 23, 2020.
- <sup>15</sup> Eke PI, Thornton-Evans GO, Wei L, et al. Periodontitis in US adults. *JADA*. 2018. 149(7): 576-588.