HPI Health Policy Institute
ADA American Dental Association®

Research Brief

Estimating the Cost of Introducing Comprehensive Medicaid Adult Dental Benefits in Hawaii

Authors: Marko Vujicic, Ph.D.; Ranjani R. Starr, Ph.D., M.P.H.; Dan F. Fujii, D.D.S., M.P.H.; Rebecca Starkel Weninger, Ph.D.; Brittany Harrison, M.A.

Key Messages

- *We estimate the additional net cost of implementing an adult Medicaid dental benefit in Hawaii, including additional dental care costs and reduced medical care costs. We do this for three different levels of dental benefits.*
- *We estimate the additional net cost on a per-enrollee per-month basis to be $3.32, $8.45,and $15.37 for the three different levels of dental benefits.*
- *We estimate the additional net cost for Oahu and for neighboring islands separately and for all adults; aged, blind, and disabled; and pregnant women.*

Introduction

Medicaid provides health insurance coverage for some of the nation's most vulnerable populations, including children, low-income adults, pregnant women, the elderly and individuals with disabilities.[1] While states have great flexibility in how they administer their Medicaid programs, all states are required to comply with the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit.[2] The EPSDT benefit 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, Hawaii is one of 16 states that provide either no coverage or emergency dental services.[3] There are 19 states that provide comprehensive adult dental coverage and another 16 that provide limited adult dental coverage.

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.[4] Providing comprehensive dental benefits to Medicaid-enrolled adults has shown to reduce costly

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.

Contact Us

Contact the Health Policy Institute for more information on products and services at **hpi@ada.org** or call 312.440.2928.

emergency department (ED) visits for dental conditions.[5,6]

Recent analysis suggests that providing dental care to pregnant women can lead to health care 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.[7,8,9,10] Thus, investing in a comprehensive dental benefit for Medicaid-enrolled adults will, in the long term, lead to reductions in medical costs financed by Medicaid. In Hawaii, 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,[11] 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 Hawaii with three possible levels of coverage. Option 1 covers a basic package of diagnostic, preventive and restorative services. Option 2 covers the basic package plus core prosthodontic services. Option 3 is a further expansion to a more robust set of prosthodontic services. All three options cover periodontal services. 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) as well as pregnant women.

Results

The estimated additional, incremental net cost of providing Medicaid adult dental benefits in Hawaii is $7.8 million per year under Option 1, $19.9 million per year under Option 2, and $36.2 million per year under Option 3 (Appendix 1 Table 1). This translates to an additional $3.32, $8.45, and $15.37 per enrollee per month in spending, respectively.

These estimates include additional spending on dental care as well as anticipated reductions in medical care costs. Additional dental care costs alone (assuming medical care cost reductions do not come to pass) are estimated to be $9.7 million per year under Option 1, $23.5 million under Option 2, and $41.5 million under Option 3.

Additional medical care cost savings estimates range from $1.9 million per year to $5.3 million. In general, the largest offsetting medical cost reductions are for pregnant women. In several scenarios we estimate that the additional dental care costs are fully offset by reduced medical care costs. In such cases, the dental benefit “pays for itself.”

Adding the additional net cost of implementing a comprehensive dental benefit to current spending levels gives an estimate of the total resources needed to fund dental benefits for adults in Hawaii. On a per enrollee per month basis, we estimate this to be $5.62, $10.62, and $17.41 for Option 1, Option 2, and Option 3, respectively.

These estimates are for total additional net spending and do not account for cost sharing between the federal and state government.

Appendix 2 Tables 2, 3, and 4 summarize more detailed modeling results for Options 1, 2, and 3 and break out the results separately for Oahu and neighboring islands.

Based on our modeling approach, our results should be interpreted as “steady state” estimates. In other words, they should not be interpreted as year one

costs, but rather medium- to long-term (e.g., 2 to 5 year horizon). Dental are utilization is likely to increase gradually when a dental benefit is introduced and medical care cost reductions, including reduced emergency department visits for dental conditions, take time to accrue.

Discussion

In this research brief, we estimate the cost of introducing a comprehensive Medicaid adult dental benefit in Hawaii. 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 policy makers in Hawaii 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 Hawaii on further research related to the dental care sector, including evaluating the impact of expanded dental benefits in Medicaid.

Data & Methods

To obtain data for our analyses, we submitted a data request to Hawaii MedQuest and received the data in February 2019. Data used for analysis include Medicaid enrollment, current dental spending, percent of Medicaid enrollees with a dental visit, numbers of Medicaid enrollees with a dental-related emergency department visit, current emergency department spending for dental care services, number of Medicaid enrollees diagnosed with diabetes and coronary artery disease, and number of pregnant women who are covered by Medicaid.

We previously developed a methodology for estimating the cost of introducing a Medicaid adult dental benefit in a particular state.[12] We modified this methodology to be specific to Hawaii and refined estimates to account for the specific plan design options being considered in Hawaii. We also accounted for estimated medical care cost savings.

Officials in Hawaii indicated that Wyoming, Illinois and Minnesota are states where the adult dental benefit in Medicaid corresponds, respectively, to Option 1, Option 2, and Option 3 being considered in Hawaii. Appendix 3 Table 5 lists the dental procedures that would be covered under each of the three options in Hawaii. We reached out to the Medicaid offices in these three states to request detailed data on their dental Medicaid program. Upon further analysis, the benefit package in Illinois is closer to Option 1.

We first estimate the percent of adults enrolled in Medicaid who would use dental care services if a dental benefit is introduced. In 2018, 8.3 percent of adults enrolled in Medicaid in Hawaii had a dental visit. For Oahu and the neighboring islands, it was 7.6 percent and 9.6 percent, respectively. We have these utilization data for each subgroup, including pregnant women and aged, blind, and disabled (ABD). We also have enrollment data separately for subgroups.

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.[10] In Wyoming, it is 16 percent; in Illinois, it is 17 percent; and in Minnesota, it is 33 percent (the highest value).

Taking these data points into consideration, if adult dental benefits were introduced in the Hawaii

Medicaid program, we assumed dental care use would increase by 7 percent points, 15 percentage points, and 23 percentage points under Option 1, Option 2, and Option 3, respectively. We assumed dental care use rates will increase by the same percentage point for all sub-populations according to medical condition (e.g., those with diabetes, coronary artery disease, and pregnant women).

Next, we estimated what average annual dental spending among adult Medicaid enrollees would be under a Medicaid dental benefit. The average annual dental spending per adult patient across states with extensive adult dental benefits in Medicaid was $556[12] in 2012 or $608 in 2018 dollars. In Wyoming, Illinois and Minnesota, it was $259, $225 and $388, respectively in 2018. We adjusted these values to account for differences in Medicaid reimbursement levels across states. We assumed that Medicaid will reimburse dental care providers for services to adults at the same level as services to children in Hawaii. However, fee schedules are different in every state. Our analysis of current Medicaid fee-for-service reimbursement rates for dental care services in all states shows that Medicaid reimbursement rates in Hawaii (for child dental care services) are very similar to those in Illinois, much higher than those in Minnesota, lower than those in Wyoming, and similar to the average across states. After adjusting for fee differences, the annual per patient dental spending ranges from $196 to $660 in the three states in "Hawaii Medicaid dollar terms." Currently in Hawaii, average annual dental spending per Medicaid enrolled adult patient who accesses dental care services is $300. In our view, this is a lower bound for what dental spending per patient would be once a comprehensive dental benefit is introduced. In our view, it is more realistic to expect increases in spending per patient; thus, we choose $660 as our upper limit under Option 3, with $540 for Option 2, and $420 for Option 1. To adjust for higher fees in the Hawaii Medicaid program for neighboring islands for most procedures, we increased these amounts by 35 percent, the current average fee difference. Thus, for neighboring islands we assumed spending per patient will be $890 under Option 3, $730 under Option 2, and $567 under Option 1.

We modeled costs separately for all adults, ABD adults, and pregnant women. These subgroups have slightly different dental care use rates as well as different spending levels. We took all of this into consideration in our model. But we assumed the impact of introducing adult dental benefits will be the same for each of the subgroups. In other words, the increase in dental care use in percentage point terms is the same for all subgroups and is independent of medical condition. We modeled additional costs derived from existing dental care patients spending an increased amount on dental care once the adult dental benefit is introduced in Medicaid. We did this by applying the increased per patient spending level to the existing volume of dental patients pre-reform.

We modeled costs for Oahu and neighboring islands separately. We have enrollment data specific to Oahu and neighboring islands, and we also have separate data on dental care use, dental spending, emergency room use and spending, and prevalence of medical conditions.

In summary, the total additional dental expenditure of implementing an expanded Medicaid adult dental benefit was estimated using the following formula:

*New Expenditure = Enrollment * Change in Utilization Rate * Dental Spending per User*

+

*Increase in Dental Spending per User*Number of Existing Dental Care Patients*

We modeled offsetting medical care cost savings. It is important to note that it is unlikely that these cost savings occur immediately. The best available evidence suggests that medical cost savings start to appear as early as year two.[8] Our model is not dynamic. Thus, it is best viewed as what is likely to occur in "steady state", not one year or even two years after adult dental benefits are introduced. It is possible to model costs over time, but given policy makers were interested more in gaining estimates for Oahu versus neighboring islands as well as three different benefit options, we made trade-offs to make the modeling manageable.

In 2018, there were 839 dental-related ED visits in Oahu and 832 in neighboring islands among adults that were paid for by Medicaid. For our purposes, we define dental emergencies as ICD-10 codes K00 - K08 and T18.0. The average cost per person per year for these ED visits was $512 in Oahu and $486 in neighboring islands.

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.[9] A recent study found a 14 percent reduction in dental-related ED visits one year after expanding adult dental benefits in Medicaid via Medicaid expansion under the Affordable Care Act.[13] Data from one state (Missouri) showed 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 63 percent by year three.[14]

Based on these studies, our model assumed a 50 percent reduction in ED visits for dental conditions after introducing an adult dental benefit in Medicaid.

In 2018, 15 percent of adults enrolled in Medicaid in Oahu and 9 percent in neighboring islands were diagnosed with diabetes. For our purposes, we defined this as having at least one diabetes-related diagnosis in the year (ICD-10 codes: E08 - E13, O24.1, O24.3, O24.9, Z79.4, Z79.84). We assumed that 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 cost savings are between $900[7] and $2,400[8] per year per patient with diabetes receiving periodontal treatment. We believe 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 who has diabetes in "steady state."

In 2018, 4 percent of adults enrolled in Medicaid in Oahu and 3 percent in neighboring islands were diagnosed with some form of coronary artery disease. For our purposes, we define this as having at least one CAD-related diagnosis in the year (ICD-10 codes: I20 - I25). We assumed that adults with coronary artery disease 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 cost savings are $1,090 per year per patient with CAD receiving periodontal treatment.[8]

In 2018, there were 5,416 pregnant women enrolled in Medicaid at some point in the year in Oahu and 3,273 in neighboring islands. At any given point in time, enrollment of pregnant women is 1,941 for Oahu and 1,136 in neighboring islands. We assumed that pregnant women 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, the estimated medical cost savings are between $1,500 (second pregnancy) and $2,400 (first pregnancy) per year per pregnant woman receiving periodontal treatement.[8] For our modeling, we choose the low end of this range and assume a medical cost reduction of $1,500 per year per pregnant women.

We assumed that 60 percent of adult Medicaid enrollees in Hawaii have some form of periodontal disease and are in need of periodontal treatment. This estimate is based on the most recent national data on the prevalence of periodontal disease among low-income adults in the United States.[15] We know of no source of such data at the state level.

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

There are numerous limitations to our analysis, which have been outlined in our original modeling work.[12] For example, the 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 assumed medical are cost savings for ABD adults will accrue to the Medicaid budget, when in fact some portion will accrue to Medicare due to dual eligibility. We assumed that Medicaid enrollees with diabetes and cardiovascular disease will use dental care at the same rate as the adult Medicaid-enrolled population.

The nature of the Medicaid adult dental benefit being proposed in Hawaii adds another layer of challenges because it does not mirror exactly the situation in states three states we drew on and is modeled separately for sub-populations of enrollees. We have drawn on the best available data and we feel our approach represents a reasonable approach. Still, it is subject to uncertainty.

Appendix 1

Table 1: Estimated Cost of Adding a Comprehensive Dental Benefit in Medicaid in Hawaii

		Oahu			Neighboring Islands			Total
		All Adults	ABD	Pregnant Women	All Adults	ABD	Pregnant Women	All Adults
Option 1	Dental care costs	$4,790,199	$1,374,598	$72,343	$4,942,233	$1,134,073	$65,373	$9,732,432
	Per enrollee per month	$3.31	$3.58	$3.11	$5.45	$5.79	$4.80	$4.13
	Medical care cost savings	$1,248,072	$603,398	$130,975	$657,463	$247,778	$77,783	$1,905,535
	Per enrollee per month	$0.86	$1.57	$5.62	$0.73	$1.26	$5.71	$0.81
	Total net cost	**$3,542,127**	**$771,199**	**($58,632)**	**$4,284,770**	**$886,295**	**($12,410)**	**$7,826,897**
	Per enrollee per month	$2.45	$2.01	($2.52)	$4.73	$4.52	($0.91)	$3.32
Option 2	Dental care costs	$12,113,183	$3,372,241	$183,312	$11,394,329	$2,578,228	$155,144	$23,507,513
	Per enrollee per month	$8.36	$8.78	$7.87	$12.58	$13.16	$11.38	$9.98
	Medical care cost savings	$2,428,824	$1,243,536	$275,859	$1,177,526	$489,893	$162,782	$3,606,350
	Per enrollee per month	$1.68	$3.24	$11.84	$1.30	$2.50	$11.94	$1.53
	Total net cost	**$9,684,359**	**$2,128,705**	**($92,548)**	**$10,216,804**	**$2,088,335**	**($7,638)**	**$19,901,163**
	Per enrollee per month	$6.69	$5.55	($3.97)	$11.28	$10.66	($0.56)	$8.45
Option 3	Dental care costs	$21,753,492	$5,968,821	$330,048	$19,741,866	$4,431,244	$273,564	$41,495,359
	Per enrollee per month	$15.02	$15.55	$14.17	$21.79	$22.62	$20.07	$17.62
	Medical care cost savings	$3,609,576	$1,883,675	$420,744	$1,697,588	$732,008	$247,780	$5,307,165
	Per enrollee per month	$2.49	$4.91	$18.06	$1.87	$3.74	$18.18	$2.25
	Total net cost	**$18,143,916**	**$4,085,146**	**($90,696)**	**$18,044,278**	**$3,699,236**	**$25,784**	**$36,188,194**
	Per enrollee per month	$12.53	$10.64	($3.89)	$19.91	$18.88	$1.89	$15.37

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 MedQuest Division of the Hawaii Department of Human Services.

Appendix 2

Table 2: Estimated Cost of Adding a Comprehensive Dental Benefit in Medicaid in Hawaii, Option 1

	Oahu			Neighboring Islands		
	All Adults	ABD	Pregnant Women	All Adults	ABD	Pregnant Women
Medicaid Enrollment, Adults	120,694	31,986	1,941	75,509	16,324	1,136
Dental care utilization rate, baseline	7.6%	8.8%	4.3%	9.6%	11.4%	5.7%
Dental care utilization rate, post reform	14.6%	15.8%	11.3%	16.6%	18.4%	12.7%
Additional enrollees with a dental visit	8,449	2,239	136	5,286	1,143	80
Average dental care costs per year per dental patient	$420	$420	$420	$567	$567	$567
Additional costs for new dental patients	$3,548,404	$940,477	$57,065	$2,996,952	$647,900	$45,088
Additional costs for existing dental patients	$1,241,795	$434,121	$15,277	$1,945,281	$486,173	$20,285
Estimated total additional dental care costs	**$4,790,199**	**$1,374,598**	**$72,343**	**$4,942,233**	**$1,134,073**	**$65,373**
Per enrollee per month	**$3.31**	**$3.58**	**$3.11**	**$5.45**	**$5.79**	**$4.80**
Estimated reduction in medical care cost for those with…						
Diabetes	$684,335	$399,031	$4,402	$266,008	$133,248	$2,742
Coronary artery disease	$226,540	$161,090	$89	$117,479	$78,603	$64
Pregnancy	$122,283	$0	$122,283	$71,568	$0	$71,568
Emergency department visits for dental conditions	$214,914	$43,277	$4,201	$202,408	$35,927	$3,410
Estimated total medical care cost savings	**$1,248,072**	**$603,398**	**$130,975**	**$657,463**	**$247,778**	**$77,783**
Per enrollee per month	**$0.86**	**$1.57**	**$5.62**	**$0.73**	**$1.26**	**$5.71**
Net cost of adult dental benefit	**$3,542,127**	**$771,199**	**($58,632)**	**$4,284,770**	**$886,295**	**($12,410)**
Per enrollee per month	**$2.45**	**$2.01**	**($2.52)**	**$4.73**	**$4.52**	**($0.91)**

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 MedQuest Division of the Hawaii Department of Human Services.

Table 3: Estimated Cost of Adding a Comprehensive Dental Benefit in Medicaid in Hawaii, Option 2

	Oahu			Neighboring Islands		
	All Adults	ABD	Pregnant Women	All Adults	ABD	Pregnant Women
Medicaid Enrollment, Adults	120,694	31,986	1,941	75,509	16,324	1,136
Dental care utilization rate, baseline	7.6%	8.8%	4.3%	9.6%	11.4%	5.7%
Dental care utilization rate, post reform	22.6%	23.8%	19.3%	24.6%	26.4%	20.7%
Additional enrollees with a dental visit	18,104	4,798	291	11,326	2,449	170
Average dental care costs per year per dental patient	$540	$540	$540	$730	$730	$730
Additional costs for new dental patients	$9,776,214	$2,595,907	$157,803	$8,268,236	$1,787,478	$124,392
Additional costs for existing dental patients	$2,336,969	$776,334	$25,508	$3,126,094	$790,750	$30,752
Estimated total additional dental care costs	**$12,113,183**	**$3,372,241**	**$183,312**	**$11,394,329**	**$2,578,228**	**$155,144**
Per enrollee per month	**$8.36**	**$8.78**	**$7.87**	**$12.58**	**$13.16**	**$11.38**
Estimated reduction in medical care cost for those with…						
Diabetes	$1,466,432	$855,066	$9,433	$570,017	$285,531	$5,876
Coronary artery disease	$485,443	$345,193	$190	$251,740	$168,435	$136
Pregnancy	$262,035	$0	$262,035	$153,360	$0	$153,360
Emergency department visits for dental conditions	$214,914	$43,277	$4,201	$202,408	$35,927	$3,410
Estimated total medical care cost savings	**$2,428,824**	**$1,243,536**	**$275,859**	**$1,177,526**	**$489,893**	**$162,782**
Per enrollee per month	**$1.68**	**$3.24**	**$11.84**	**$1.30**	**$2.50**	**$11.94**
Net cost of adult dental benefit	**$9,684,359**	**$2,128,705**	**($92,548)**	**$10,216,804**	**$2,088,335**	**($7,638)**
Per enrollee per month	**$6.69**	**$5.55**	**($3.97)**	**$11.28**	**$10.66**	**($0.56)**

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 MedQuest Division of the Hawaii Department of Human Services.

Table 4: Estimated Cost of Adding a Comprehensive Dental Benefit in Medicaid in Hawaii, Option 3

	Oahu			Neighboring Islands		
	All Adults	ABD	Pregnant Women	All Adults	ABD	Pregnant Women
Medicaid Enrollment, Adults	120,694	31,986	1,941	75,509	16,324	1,136
Dental care utilization rate, baseline	7.6%	8.8%	4.3%	9.6%	11.4%	5.7%
Dental care utilization rate, post reform	30.6%	31.8%	27.3%	32.6%	34.4%	28.7%
Additional enrollees with a dental visit	27,760	7,357	446	17,367	3,755	261
Average dental care costs per year per dental patient	$660	$660	$660	$890	$890	$890
Additional costs for new dental patients	$18,321,349	$4,855,930	$294,644	$15,456,692	$3,341,523	$232,539
Additional costs for existing dental patients	$3,432,143	$1,112,890	$35,404	$4,285,174	$1,089,721	$41,025
Estimated total additional dental care costs	**$21,753,492**	**$5,968,821**	**$330,048**	**$19,741,866**	**$4,431,244**	**$273,564**
Per enrollee per month	$15.02	$15.55	$14.17	$21.79	$22.62	$20.07
Estimated reduction in medical care cost for those with…						
Diabetes	$2,248,529	$1,311,101	$14,464	$874,026	$437,814	$9,009
Coronary artery disease	$744,346	$529,296	$292	$386,002	$258,267	$209
Pregnancy	$401,787	$0	$401,787	$235,152	$0	$235,152
Emergency department visits for dental conditions	$214,914	$43,277	$4,201	$202,408	$35,927	$3,410
Estimated total medical care cost savings	**$3,609,576**	**$1,883,675**	**$420,744**	**$1,697,588**	**$732,008**	**$247,780**
Per enrollee per month	**$2.49**	**$4.91**	**$18.06**	**$1.87**	**$3.74**	**$18.18**
Net cost of adult dental benefit	**$18,143,916**	**$4,085,146**	**($90,696)**	**$18,044,278**	**$3,699,236**	**$25,784**
Per enrollee per month	**$12.53**	**$10.64**	**($3.89)**	**$19.91**	**$18.88**	**$1.89**

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 MedQuest Division of the Hawaii Department of Human Services.

Appendix 3

Table 5: Summary of Dental Services Covered Under Option 1, Option 2, and Option 3

CDT	Procedure	Option 1	Option 2	Option 3
D0120	Periodic Oral Evaluation	x	x	x
D0140	Limited Oral Evaluation - Problem Focused	x	x	x
D0145	Oral Evaluation for a patient under 3 years of age	x	x	x
D0150	Comprehensive Oral Evaluation	x	x	x
D0210	Intraoral - Complete Series	x	x	x
D0220	Intraoral - Periapical First Radiographic Image	x	x	x
D0230	Intraoral - Periapical Each Additional Radiographic Image	x	x	x
D0240	Intraoral - Occlusal Radiographic Image	x	x	x
D0270	Bitewing - Single Radiographic Image	x	x	x
D0272	Bitewings - Two Radiographic Images	x	x	x
D0274	Bitewings - Four Radiographic Images	x	x	x
D0330	Panoramic Radiographic Image	x	x	x
D0364	Cone Beam CT with limited field of view- less than one whole jaw	x	x	x
D0365	Cone beam CT with field of view of one full dental arch-mandible	x	x	x
D0366	Cone beam CT with field of view of one full dental arch - maxilla	x	x	x
D0367	Cone Beam CT - Field of View of Both Jaws	x	x	x
D1110	Prophylaxis - Adult	x	x	x
D1206	Topical Application of Fluoride Varnish	x	x	x
D2140	Amalgam - One Surface - Permanent	x	x	x
D2150	Amalgam - Two Surfaces - Permanent	x	x	x
D2160	Amalqam - Three Surfaces - Permanent	x	x	x
D2161	Amalaam - Four or More Surfaces - Permanent	x	x	x
D2330	Resin - One Surface, Anterior - Permanent	x	x	x
D2331	Resin - Two Surfaces, Anterior - Permanent	x	x	x
D2332	Resin - Three Surfaces, Anterior - Permanent	x	x	x
D2335	Resin - Four or More Surfaces/Incisal Angle, Anterior - Permanent	x	x	x
D2391	Resin - One Surface, Posterior - Permanent	x	x	x
D2392	Resin - Two Surfaces, Posterior - Permanent	x	x	x
D2393	Resin - Three Surfaces, Posterior - Permanent	x	x	x
D2394	Resin - Four or More Surfaces, Posterior - Permanent	x	x	x
D2910	Re-cement/Re-bond PartialCoveraae Restoration	x	x	x
D2920	Re-cement/Re-bond Crown	x	x	x
D2931	Prefabricated Stainless Steel Crown - Permanent		x	x
D2950	Core Buildup, Including Anv Pins		x	x
D2951	Pin Retention - Per Tooth, In Addition to Restoration		x	x
D2952	Post and Core In Addition to Crown, Indirectly Fabricated		x	x

D2954	Prefabricated Post and Core In Addition to Crown		x	x
D3310	Endodontic therapy- Anterior			x
D3320	Endodontic therapy- Bicuspid			
D3330	Endodontic Theraov - Molar		x	x
D4341	Periodontal Scalina/Root Planina (4 or More Teeth per Quad)	x	x	x
D4342	Periodontal Scaling/Root Planing (1-3 Teeth)	x	x	x
D4355	Full Mouth Debridement	x	x	x
D4910	Periodontal Maintenance	x	x	x
D7111	Extraction, coronal remnants-deciduous tooth	x	x	x
D7140	Extraction, Erupted Tooth/Exposed Root - Permanent	x	x	x
D7140	Extraction, Erupted Tooth/Exposed Root - Primary	x	x	x
D7210	Surqical Removal of Erupted Tooth	x	x	x
D7220	Removal of Impacted Tooth - Soft Tissue	x	x	x
D7230	Removal of Impacted Tooth - Partially Bony	x	x	x
D7240	Removal of Impacted Tooth - Completely Bony	x	x	x
D7241	Removal of Impacted Tooth - Completely Bony, Complicated	x	x	x
D7250	Suraical Removal of Residual Tooth Roots	x	x	x
D7260	Oroanral Fistula Closure	x	x	x
D7270	Tooth Reimplantation/Stabilization of Evusled/Displaced Tooth	x	x	x
D7280	Suraical Access of an Unerupted Tooth	x	x	x
D7282	Mobilization of Erupted/Malpositioned Tooth to Aid Eruption	x	x	x
D7283	Placement of Device to Facilitate Eruption of Impacted Tooth	x	x	x
D7285	Biopsy of Oral Tissue - Hard (Bone, tooth)	x	x	x
D7286	Biopsy of Oral Tissue - Soft	x	x	x
D7310	Alveoloplasty with Extractions (4 or More Teeth per Quad)	x	x	x
D7311	Alveoloplasty with Extractions (1-3 Teeth)	x	x	x
D7320	Alveoloplasty without Extractions (4 or More Teeth per Quad)	x	x	x
D7321	Alveoloolasty without Extractions (1-3 Teeth)	x	x	x
D7410	Excision of Beniqn Lesion up to 1.25 cm	x	x	x
D7411	Excision of Benign Lesion greater than 1.25 cm	x	x	x
D7510	Incision and Drainaqe of Abscess, Intraoral	x	x	x
D7970	Excision of Hvperplastic Tissue - Per Arch	x	x	x
D7971	Excision of Pericoronal Gingiva	x	x	x
D9110	Palliative (Emerqencv) Treatment of Dental Pain	x	x	x
D9230	Inhalation of Nitrous Oxide/Analgesia, Anxiolysis	x	x	x
D9239	Intravenous Moderate (Conscious) Sedation/Analgesia - First 15 minutes	x	x	x
D9243	Intravenous Moderate (Conscious) Sedation/Analgesia - Each Subsequent 15 Minute increment	x	x	x
D9310	Consultation - DiaQnostic Service	x	x	x
D9420	Hospital/Ambulatory Surqical Center Call	x	x	x
D9440	Office Visit - After ReQularly Scheduled Office Hours	x	x	x
D9995	Teledentistrv-svnchronous; real-time encounter	x	x	x

D9996	Teledentistry-asynchronous; information stored and forwarded to dentist for subsequent review.	x	x	x
D5110	Complete Denture - Maxillarv		x	x
D5120	Complete Denture - Mandibular		x	x
D5130	Immediate Denture - Maxillary		x	x
D5140	Immediate Denture - Mandibular		x	x
D5213	Maxillary Partial Denture- Cast Metal Base			x
D5214	Mandibular Partial Denture- Cast Metal Base			x
D5410	Adiust Complete Denture - Maxillary		x	x
D5411	Adjust Complete Denture - Mandibular		x	x
D5421	Adjust Partial Denture - Maxillary		x	x
D5422	Adjust Partial Denture - Mandibular		x	x
D5511	Repair Broken Complete Denture Base, Mandibular		x	x
D5512	Repair Broken Complete Denture Base, Maxillary		x	x
D5520	Replace Missina/Broken tooth - Complete Denture		x	x
D5611	Repair broken partial denture base- mandibular		x	x
D5612	Repair broken partial denture base- maxillary		x	x
D5640	Replace Broken Teeth - Per Tooth		x	x
D5650	Add Tooth to Existina Partial Denture		x	x
D5660	Add Clasp to Existina Partial Denture		x	x
D5710	Rebase Complete Maxillary Denture		x	x
D5711	Rebase Complete Mandibular Denture		x	x
D5720	Rebase Maxillary Partial Denture		x	x
D5721	Rebase Mandibular Partial Denture		x	x
D5730	Reline Complete Maxillary Denture (Chairside)		x	x
D5731	Reline Complete Mandibular Denture (Chairside)		x	x
D5740	Reline Maxillary Partial Denture (Chairside)		x	x
D5741	Reline Mandibular Partial Denture (Chairside)		x	x
D5750	Reline Complete Maxillary Denture (Laboratory)		x	x
D5751	Reline Complete Mandibular Denture (Laboratory)		x	x
D5760	Reline Complete Maxillary Partial Denture (Laboratory)		x	x
D5761	Reline Complete Mandibular Partial Denture (Laboratory)		x	x
D2740	Crown - Porcelain Ceramic Substrate			x
D2750	Crown - Porcelain Fused to Hiah Noble Metal			x
D2751	Crown - Porcelain Fused to Predominantly Base Metal			x
D2752	Crown - Porcelain Fused to Noble Metal			x
D2790	Crown - Full Cast Hiah Noble Metal			x
D2791	Crown - Full Cast Predominantly Base Metal			x
D2792	Crown - Full Cast Noble Metal			x
D3310	Endodontic Therapv - Anterior			x
D5211	Maxillary Partial Denture - Resin Base			x
D5212	Mandibular Partial Denture - Resin Base			x

D5213	Maxillary Partial Denture - Cast Metal Base			x
D5214	Mandibular Partial Denture - Cast Metal Base			x
D5621	Repair Cast Framework - mandibular			x
D5622	Repair Cast Framework - maxillary			x
D5630	Repair or Replace Broken Retentive Clasping Materials - per tooth			x
D5820	Maxillary Interim Partial Denture		x	
D5821	Mandibular Interim Partial Denture		x	

Acknowledgments

We thank Dr. Mona Van Kanegan of the Division of Oral Health of the Illinois Department of Public Health, Dr. Linda Mayten of the Minnesota Department of Human Services, and Stacey Chazin of the American Network of Oral Health Coalitions for their quick turnaround time in providing data needed for our analysis, as well as Steve Geierman of the Council on Access, Prevention, and Interprofessional Relations at the American Dental Association for his assistance with making these contacts. Specific to Hawaii, we thank Nancy Partika of the Hawaii Coalition for Oral Health for proving input and Anming Tan of the MedQuest Division of the Hawaii Department of Human Services for providing necessary data in timely a manner and for input on methodology throughout our collaboration on this study.

This Research Brief was published by the American Dental Association's Health Policy Institute.

211 E. Chicago Avenue
Chicago, Illinois 60611
312.440.2928
hpi@ada.org

For more information on products and services, please visit our website, www.ada.org/hpi.

References

[1] 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.

[2] 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.

[3] 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.

[4] Choi MK. The impact of Medicaid insurance on dental service use. *J Health Econ*. 2011;30:1020-1031.

[5] 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 Affairs*. 2015;34(5):749-756.

[6] 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.

[7] Nasseh K, Vujicic M, Glick M. The relationship between periodontal interventions and healthcare costs and utilization. Health Econ. 2016 Jan 22. Doi: 10.1002/hec.3316.

[8] Jeffcoat M K, Jeffcoat R L, Gladowski P A, Bramson J B, Blum J J. 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.

[9] 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. Accessed January 23, 2020.

[10] Elani HW, Simon L, Ticku S, Bain PA, Barrow J, Riedy, CA. Does providing dental services reduce overall health care costs? A systematic review of the literature. *JADA.* 2018; 149(8): 696-703. doi.org/10.1016/j.adaj.2018.03.023

[11] American Dental Association. Hawaii'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/Hawaii-facts. Accessed January 23, 2020.

[12] 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. Accessed July 18, 2016.

[13] 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.

[14] Oral Health Progress and Equity Network. Available from: http://www.oralhealth.network/p/cm/ld/fid=1. Accessed January 23, 2020.

[15] Eke PI, Thornton-Evans GO, Wei L, et al. Periodontitis in US adults. *JADA*. 2019. 149(7): 576-589.