CareQuest Institute for Oral Health

MDAC Maryland Dental Action Coalition

RESEARCH REPORT

Financial Impact of Emergency Department Visits for Dental Conditions in Maryland:

An Update

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Glossary

ED – emergency department
NTDC – non-traumatic dental condition
FY – fiscal year
DEA – dual-eligible adult

Executive Summary

This report updates findings from a 2017 report by the DentaQuest Institute (now known as CareQuest Institute for Oral Health) that examined trends in emergency department (ED) visits by Maryland adults over a four-year period. The current report uses inpatient and outpatient revisit databases from the Health Services Cost Review Commission to examine the scope of hospital utilization and the financial impact of ED visits for non-traumatic dental conditions (NTDCs) from FY2013 through FY2019. In addition to using updated data, this report also uses standards recently adopted by national organizations to measure ED visits for non-traumatic dental conditions.

Our analysis finds that there were 35,300 ED visits for non-traumatic dental conditions among all adults in Maryland in FY2019, at a cost to all payers of $25.7 million. The number of visits has fallen substantially in recent years, declining 8% between FY2018 and FY2019. However, Maryland continues to have rates of adult ED visits for NTDCs that exceed the national average. Moreover, average charges for these visits are increasing over time, from $486 in FY2013 to $728 in FY2019. This increase is more than double the rate of increase in ED visits for other reasons.

The state's Medicaid program pays a disproportionate share of the cost for these visits. Although Medicaid members comprise only 17% of Maryland adults, they account for 54% of all the state's ED visits for non-traumatic dental conditions and 46% of total cost.

In 2018, Maryland established a pilot program providing dental benefits for Maryland adults between the ages of 21 and 64 who are dually eligible for Medicare and Medicaid. The oral health services covered by this pilot program include diagnostic, preventive, and restorative services and are subject to an $800 per person maximum benefit per calendar year. While ED visits among Maryland's dual-eligible adult population dropped by 10% in FY2019, the cause of this decline is outside the time-scope of the analyses in this study. We will continue to monitor the trends in this population over time as more data become available.

The analysis demonstrates that expanding dental benefits to adult Medicaid participants is an opportunity for policy change aimed at reducing ED visits for non-traumatic dental conditions in Maryland.

EDs Are No Place for Dental Care

More than 1 in 4 US adults have untreated tooth decay. Nearly half (46%) of all adults aged 30 years or older show signs of periodontal (gum) disease. Untreated oral disease can negatively affect overall health, such as by making it tougher for people with diabetes to manage their blood sugar. For all these reasons, it is crucial for Americans to have regular access to dental care.

Many states have seen a widening gap between low-income and high-income non-elderly adults' use of dental care. People who lack public or private insurance for routine dental services are more likely to forgo regular care and seek treatment in hospital EDs when an oral health problem causes pain or other complications. In addition, adults are more likely than children to be admitted to EDs for dental-related needs. The vast majority of dental-related visits to hospital EDs are made for NTDCs that typically can be treated in a dental office. These ED visits are costly and rarely address the root cause because most EDs are not equipped with the clinicians, instruments, or supplies to perform procedures to fully address oral diseases. In Maryland, one exception is the University of Maryland Medical Center in Baltimore, which includes clinicians and students from the School of Dentistry and Dental Hygiene.

Over 74 million Americans lack access to dental coverage — three times the number of people without medical insurance. This is especially important for individuals with Medicaid, as it is optional for states to offer coverage for adults, and thus dental coverage for Medicaid members varies widely by state and over time. As of January 2021, three states provide no adult dental benefit, and nine states cover emergency services only.[1] Even when state Medicaid programs offer extensive coverage, the benefits are subject to cuts in difficult budget cycles and may be at significant risk due to COVID-19 shortfalls. Additionally, nearly half of seniors lack dental insurance, as traditional Medicare does not cover dental services.

For states, the financial implications of ED visits are profound. Although state Medicaid programs are not required to cover dental services, all states are required to reimburse hospitals for ED visits by their adult Medicaid members. The costs to state Medicaid programs are significant because the number of dental-related visits is substantial, particularly when members cannot access dental services in dental offices because there is no coverage available.

[1] States define emergency services differently, although most include emergency treatment for pain and infection.

Can providing Medicaid-enrolled adults with dental coverage for routine and restorative services reduce the rate at which adults seek care in hospital EDs for NTDCs? Recent reports suggest that it can. For example, researchers have linked a decline in dental-related ED visits by young adults to a federal policy change that improved their coverage. In 2016, Missouri restored Medicaid dental benefits to about 350,000 of its adult members. Two years later, the state reported that the rate of ED visits for NTDCs had dropped by 38% since 2015.

CareQuest Institute for Oral Health and the Maryland Dental Action Coalition (MDAC) are deeply interested in learning more about the association between dental coverage and ED visits. This report examines hospital visits for dental conditions in the context of ongoing policy changes by Maryland's Medicaid program. This report updates previous reports on hospital visits for dental conditions in Maryland and serves as a baseline for tracking trends in hospital visits across insurance types. It also shares data on the dual-eligible population — adults who are both Medicaid and Medicare members. CareQuest Institute and MDAC will continue monitoring these trends to explore how improvements in Medicaid adult dental benefits might be connected to reductions in the rate of dental-related ED visits.

Maryland's Policy Change

A 2017 report by the DentaQuest Institute (now CareQuest Institute) examined the trend of ED visits by Maryland adults over a four-year period, culminating in 2016. While managed care organizations that contract with the state's Medicaid program may voluntarily offer limited dental benefits to Medicaid-enrolled adults, this is clearly not enough. This report showed that dental ED visits among all adults cost nearly $1 billion over a four-year period. By the final year of this analysis, 53% of these Maryland ED visits were paid for by the state's Medicaid program. Although the rate of Maryland's dental ED visits per 10,000 adults declined over the four-year period that was studied, the state's rate was significantly higher than national rates of ED visits for non-traumatic dental conditions.

Supported by these and other data related to the unmet oral health needs of adults, MDAC and its allies cited the 2017 report as they campaigned to expand Medicaid dental benefits for adults. In 2018, Governor Larry Hogan signed legislation that established a pilot program providing dental benefits to Maryland adults between the ages of 21 and 64 who are dually eligible for Medicare and Medicaid. Taking effect in June 2019, the pilot program provides an estimated 38,000 adults with dental coverage.

The oral health services covered by this pilot program include diagnostic, preventive, and restorative services. Thus far, these benefits are subject to an $800 per person maximum benefit per calendar year. In 2020, more than 4,000 adults received dental services under this pilot program, amounting to more than $1.2 million. This is notable, especially as dental office closures associated with the COVID-19 pandemic likely limited patient's ability to get care in 2020.

Methodology

To update the findings from the prior report, this report uses data from the Health Services Cost Review Commission for FY2013 through FY2019. Inpatient and outpatient revisit databases were used to examine the scope of hospital utilization for NTDCs. The study received institutional review board (IRB) approval from the Western Institutional Review Board. The analysis was restricted to adults, defined as Maryland residents who were aged 20 or older at the time of admission to the hospital.

To identify ED visits for NTDCs, we defined a health care encounter as an ED visit using measure specifications recommended by the Dental Quality Alliance (DQA). Furthermore, we defined NTDCs based on listed diagnoses using the ICD-9-CM or ICD-10-CM codes as recommended by the Association of State and Territorial Dental Directors, a validated approach to identify NTDC ED visits (see Appendix 1). Comparisons of alternative measure specifications for ED visits for dental conditions can be found in Appendix 2.

For inpatient data, we identified an encounter as an inpatient visit if the patient was admitted to the hospital for an emergency and was in the care of the medical or surgical department. We defined an encounter as an inpatient visit for an NTDC if:

- Any of the ICD-9-CM or ICD-10-CM diagnosis codes as recommended by the DQA measure was presented as a first-listed diagnosis (see Appendix 1); and
- The patient had an additional listed diagnosis code for cellulitis and abscess of face/neck or swelling mass or lump in head or neck (ICD-9-CM: 682.0, 682.1 or 784.2; ICD-10-CM: L03.211 - L03.213, L03.221 - L03.222, R22.0 or R22.1). Note that all additional listed diagnosis codes were accompanied by a first-listed diagnosis code.

Population rates were calculated using population estimates from the U.S. Census Bureau. Rates in the Medicaid population and the dual-eligible population were calculated using information on average monthly enrollment in Medicaid provided by the Hilltop Institute. Payers for hospital visits were grouped into the following categories: commercial insurance, Medicaid, Medicare, uninsured/self-pay, and other payers. The Medicaid category combines the managed care and fee-for-service plans. In order to better understand demographic differences in ED visits for NTDCs, the results were stratified by sex, age, and race/ethnicity. Race and ethnicity were categorized as non-Hispanic white, non-Hispanic Black, non-Hispanic other racial group, and Hispanic. Sex was defined as either female or male. Age was categorized into the following age groups: 20–24, 25–34, 35–44, 45–54, 55–64, 65–74, and 75 and over. The overall outpatient revisit rate; revisit rate within 30 days; and consecutive visit rate for NTDCs were calculated using a unique patient ID and the time elapsed between visits. The financial impact of ED or inpatient visits for NTDCs was estimated using inflation-adjusted total charges and average charge per visit.

Declining ED Visits, but Rising Costs, for Dental Conditions in Maryland

ED visits and inpatient admissions, measured collectively among all Maryland adults, fell by 32% to 35,300 visits in FY2019, from a high of 52,248 visits in FY2013 (Exhibit 1). These visits fell by 8% between FY2018 and FY2019. The declines in raw numbers are accompanied by a decline in the population rates, declining from 118 visits per 10,000 adults in

FY2013 to 77 visits per 10,000 adults in FY2019, a 35% decrease. While these declines are substantial, Maryland continues to have rates of ED visits for NTDCs that exceed the national average. In FY2018, Maryland had 83 visits per 10,000 adults, while nationally there were 66 visits per 10,000 adults (Exhibit 2).[2]

On average, annual costs in Maryland are $26 million in inflation-adjusted charges for ED visits and inpatient admissions for dental conditions (Exhibit 1). Average charges for ED visits for dental conditions are increasing over time, from $486 in FY2013 to $728 in FY2019. This increase is growing significantly faster than average charges are increasing for non-dental ED visits. Between FY2013 and FY2019, charges for ED visits for dental conditions increased at more than double the rate of increase of average charges for non-dental ED visits (58% for dental conditions, compared to 27% for ED visits for other reasons). The annual average growth rate for ED visits for dental conditions is 8%, compared to 4% for ED visits for other reasons (Exhibit 3).

Exhibit 1: Emergency Department and Inpatient Admissions for Non-Traumatic Dental Conditions Among Adults in Maryland

	Count						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	51,585	50,852	48,313	45,152	41,126	37,835	34,830
Inpatient Admissions	663	661	589	528	497	519	470
Total	**52,248**	**51,513**	**48,902**	**45,680**	**41,623**	**38,354**	**35,300**
	Rate Per 10,000 Adult Population						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	116.8	114.2	107.7	100.2	90.9	83.3	76.4
Inpatient Admissions	1.5	1.5	1.3	1.2	1.1	1.1	1.0
Total	**118.3**	**115.7**	**109.0**	**101.4**	**92.0**	**84.4**	**77.4**
	Inflation-Adjusted Total Charges						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$19,637,070	$20,975,993	$21,804,310	$22,625,638	$21,860,843	$20,836,440	$20,916,488
Inpatient Admissions	$5,749,325	$5,566,510	$6,031,652	$5,336,545	$4,287,356	$4,513,330	$4,792,091
Total	**$25,386,395**	**$26,542,503**	**$27,835,962**	**$27,962,183**	**$26,148,198**	**$25,349,769**	**$25,708,579**
	Inflation-Adjusted Average Charges Per Visit						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$381	$412	$451	$501	$532	$551	$601
Inpatient Admissions	$8,672	$8,421	$10,240	$10,107	$8,626	$8,696	$10,196
Total	**$486**	**$515**	**$569**	**$612**	**$628**	**$661**	**$728**

[2] Data for national rates were obtained from the Nationwide Emergency Department Sample (NEDS) for the years 2013–2018. NEDS is the largest, all-payer U.S. ED database and provides appropriate weights to determine national-level estimates of all hospital-based ED visits.

Exhibit 2: Rates for ED Visits for Non-Traumatic Dental Conditions Among Adults in Maryland and Nationally

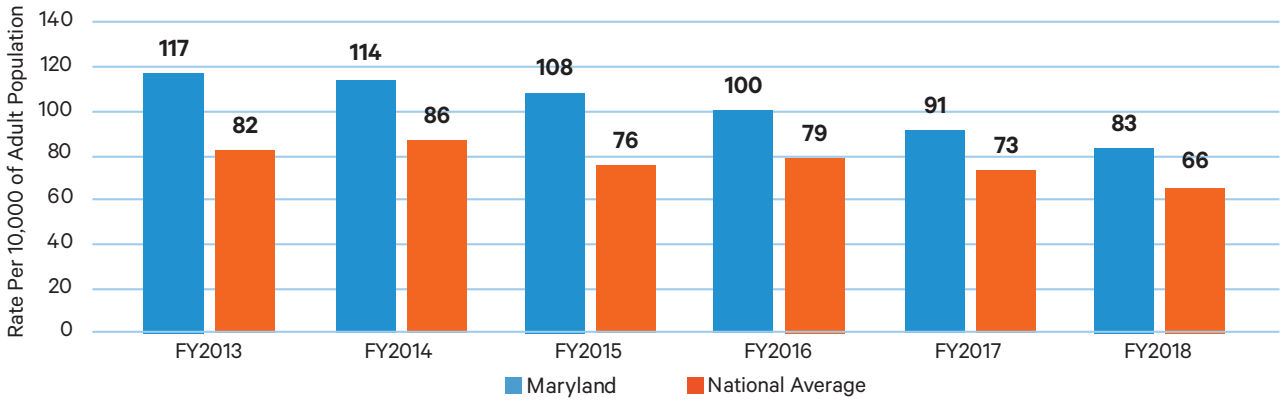
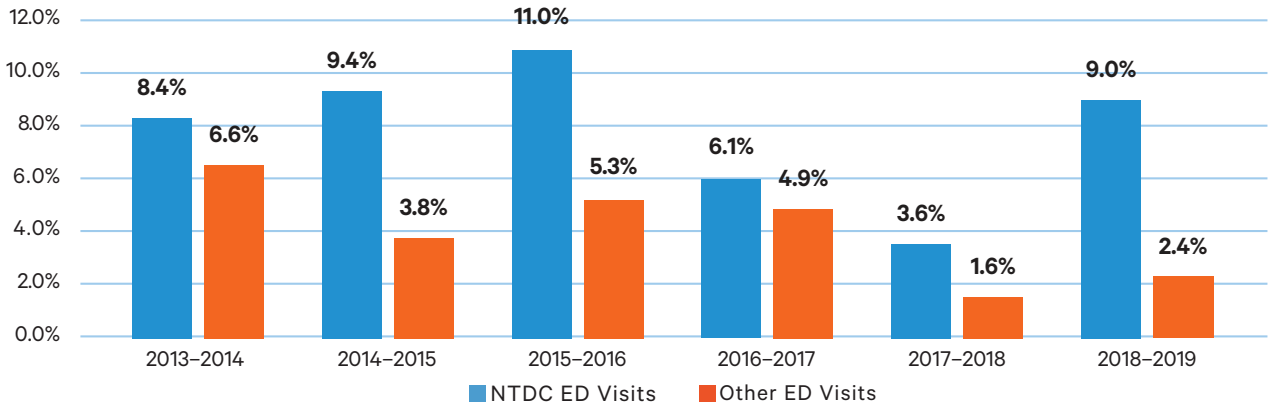


Exhibit 3: Annual Percent Increase in Average Charges Per Visit Among Adults in Maryland by ED Visit Type

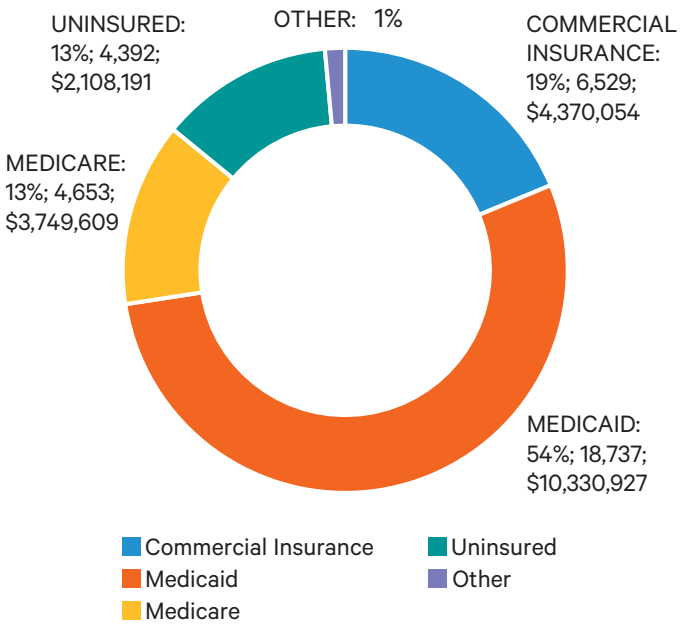


This increase may be partially associated with an increase in the incidence of acute periapical abscess, which often requires additional services, including draining of the abscess. Diagnoses of periapical abscess have risen from being present in 11% of all ED visits for dental conditions in FY2013 to 17% of all ED visits for dental conditions in FY2019. Periapical abscesses are preventable conditions caused by bacterial infection and, if left untreated, can spread to other parts of the body and lead to additional infections or even death.

The payers for ED visits for NTDCs in FY2019 were Medicaid (54%), commercial insurers (19%), Medicare (13%), uninsured/self-pay (13%) ,and other sources (1%) (Exhibit 4). Roughly two-thirds of the costs for all ED visits by Maryland adults in 2019 were paid by Medicaid ($10.2 million) or Medicare ($3.7 million).

EDs are not equipped to provide definitive dental care, instead typically offering prescriptions for antibiotics and opioids. If adults are not able to get care at a dental office due to an inability to pay out of pocket, this may lead to a cycle of ED visits for ongoing dental conditions or expensive inpatient admission if their condition worsens. In FY2019, 31% of all visits were among patients who returned to the ED more than once for a dental condition, and 20% of all patients returned within 30 days of their initial visit.

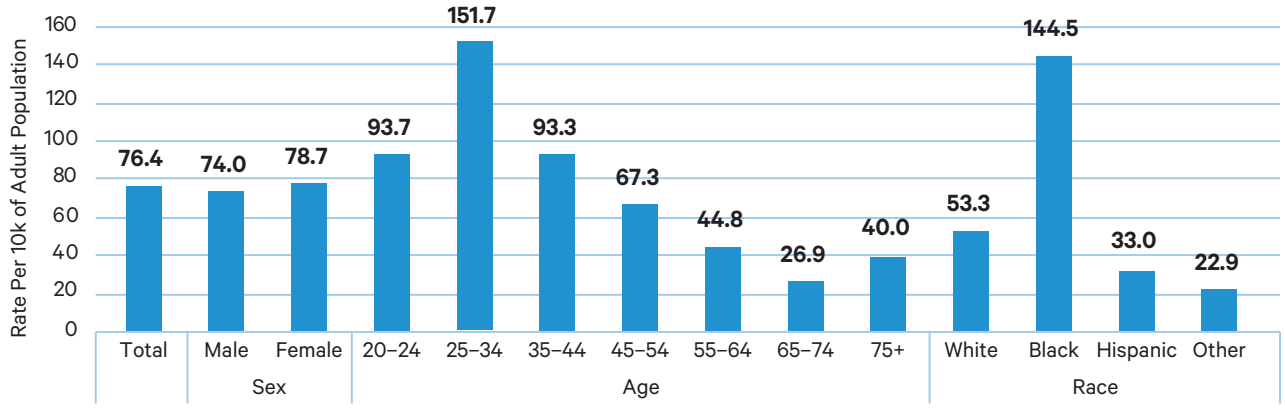
Exhibit 4: Distribution of Payers of ED Visits for Non-Traumatic Dental Conditions among Adults in Maryland, FY2019



Disparities in ED Visits

ED visits are not equally distributed across the population. Adults aged 25–34 have the highest rates of ED visits for NTDCs, at 152 visits per 10,000 adults. Rates steadily decrease with age; those aged 65–74 have the lowest rates, at 27 visits per 10,000 adults (Exhibit 5). Black adults have the highest rates among racial groups of ED visits, at 145 visits per 10,000 adults — nearly three times the rate of other racial/ethnic groups. Hispanic adults and adults who identify their race as "other" have the lowest rates, at 33 and 23 visits per 10,000 adults, respectively.

Exhibit 5: Rate of ED Visits for Non-Traumatic Dental Conditions among Adults, by Age, Sex, and Race in FY 2019



Medicaid Pays Disproportionate Share of Cost

There were 18,904 NTDC ED visits and inpatient admissions among adult Medicaid participants in Maryland in FY2019 (Exhibit 6). The number of ED visits fell 11% between FY2018 and FY2019 alone. This 1-year drop represents a larger percentage decline than the 8% reduction over the previous 5-year period (2013-18). While these declines are substantial, adult Medicaid participants in Maryland have rates of ED visits for NTDCs that exceed both the Maryland average and national average. Overall, in Maryland there were 76 NTDC ED visits for every 10,000 adults, but there were 253 such visits for every 10,000 Medicaid-enrolled adults. In FY2018, there were 283 visits per 10,000 adults among adults enrolled in Medicaid in Maryland, while nationally there were 172 visits per 10,000 adults (Exhibit 7).

Medicaid clearly pays for a disproportionately large number of ED visits for NTDCs in Maryland. Since Medicaid expansion in FY2014, between 15% and 17% of the total adult population has been enrolled in Medicaid (Exhibit 8) and one-third (33%) of all ED visits among adults for any reason are by Medicaid participants. However, more than half (54%) of ED visits for NTDCs are by Medicaid participants. There are large numbers of repeat visits as well, with nearly 4 in 10 ED visits for NTDCs being among those who have gone more than once.

Exhibit 6: Emergency Department and Inpatient Admissions for Non-Traumatic Dental Conditions Among Medicaid-Enrolled Adults in Maryland

	Count						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	23,010	25,765	26,514	23,403	22,884	21,138	18,737
Inpatient Admissions	148	174	173	178	192	203	167
Total	**23,158**	**25,939**	**26,687**	**23,581**	**23,076**	**21,341**	**18,904**
	Rate Per 10,000 Adult Population						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	465.3	386.1	404.4	337.4	311.4	282.7	252.9
Inpatient Admissions	3.0	2.6	2.6	2.6	2.6	2.7	2.3
Total	**468.3**	**388.8**	**407.0**	**339.9**	**314.0**	**285.4**	**255.1**
	Inflation-Adjusted Total Charges						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$8,507,745	$10,178,310	$11,276,766	$10,772,958	$11,448,346	$10,795,391	$10,330,927
Inpatient Admissions	$1,423,753	$1,523,128	$1,942,609	$1,885,462	$1,684,053	$1,943,166	$1,465,914
Total	**$9,931,499**	**$11,701,438**	**$13,219,375**	**$12,658,420**	**$13,132,399**	**$12,738,558**	**$11,796,841**
	Inflation-Adjusted Average Charges Per Visit						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$370	$395	$425	$460	$500	$511	$551
Inpatient Admissions	$9,620	$8,754	$11,229	$10,592	$8,771	$9,572	$8,778
Total	**$429**	**$451**	**$495**	**$537**	**$569**	**$597**	**$624**

Exhibit 7: Rates for ED Visits for Non-Traumatic Dental Conditions among Medicaid-Enrolled Adults in Maryland and Nationally

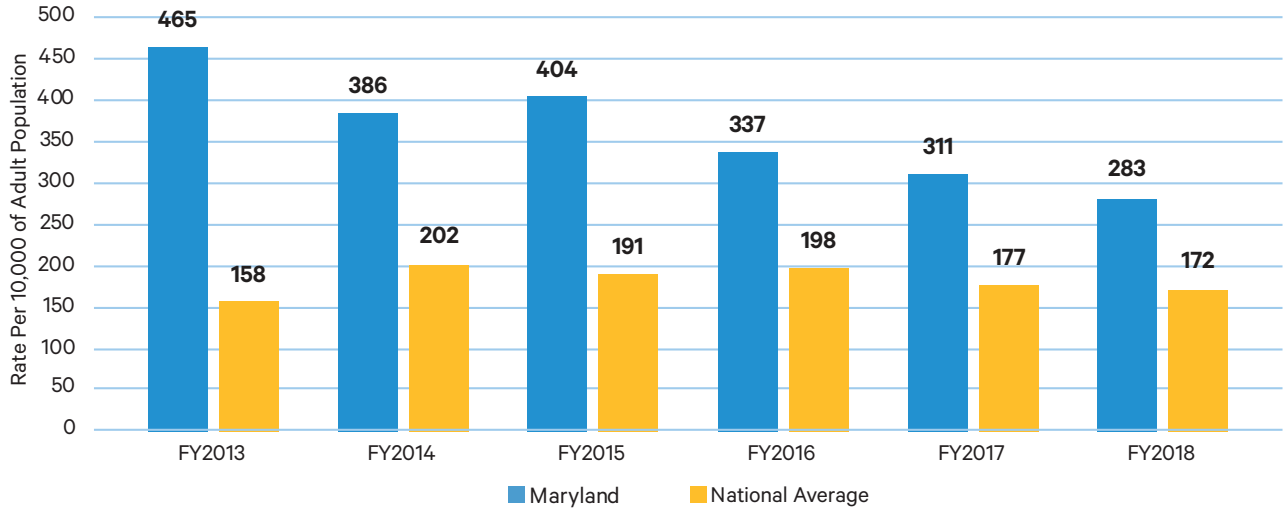
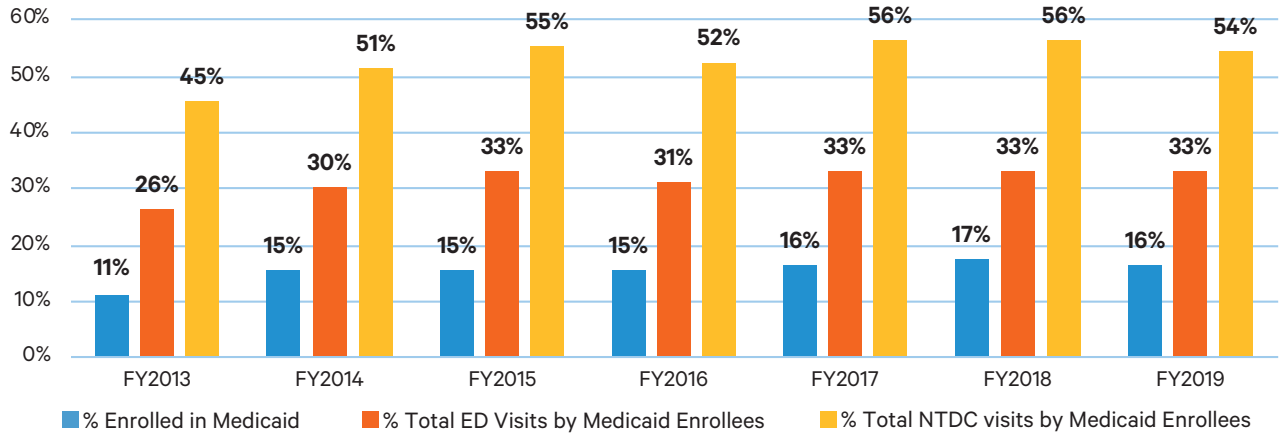


Exhibit 8: Disproportionate Burden of ED Visits for Non-Traumatic Dental Conditions by Medicaid-Enrolled Adults in Maryland



ED Visits by Dual-Eligible Adults, Age 21–64

In 2019, there were 1,674 NTDC ED visits among Maryland's dual-eligible adults (DEAs) between the ages of 21 and 64, a decline of 10% from the prior year (Exhibit 9).[3] Rate information, which is only available for FY2018 and FY2019, also demonstrates a drop between those years, from 297 to 271 visits per 10,000 adults. These population rates are slightly higher than those for adults enrolled only in Medicaid and significantly higher than the adult population as a whole. The total cost in 2019 for ED visits and inpatient admissions among DEAs was $1,288,762, which represents a decline of more than $215,000 from the previous year.

Rates of inpatient admissions for DEAs are double the rate of the adult Medicaid population and six times the overall rate.

This high rate makes sense, given the high rate of chronic diseases in the DEA population. In fact, DEAs are three times more likely to report having "poor" health than other Medicare members.

The decline in overall ED visits mirrors the broader trend toward lower rates of ED visits for NTDCs in Maryland and nationally. While we plan to collect and analyze data from future fiscal years, we recognize that data from 2020 could be challenging to interpret because of how dental office closures (and guidance to avoid EDs for any non-COVID reason) due to the COVID-19 pandemic might have affected people's ability to get dental care in any location.

Exhibit 9: Emergency Department and Inpatient Admissions for Non-Traumatic Dental Conditions Among Dual-Eliigible Adults Aged 21–64 in Maryland

	Count						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	2,377	2,259	2,259	2,144	2,005	1,856	1,674
Inpatient Admissions	44	40	43	33	36	38	29
Total	**2,421**	**2,299**	**2,302**	**2,177**	**2,041**	**1,894**	**1,703**
	Rate Per 10,000 Adult (21-64) Dual-Eligible Population						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	--	--	--	--	--	291.3	266.2
Inpatient Admissions	--	--	--	--	--	6.0	4.6
Total	**--**	**--**	**--**	**--**	**--**	**297.3**	**270.8**
	Inflation-Adjusted Total Charges						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$945,054	$1,073,448	$1,191,808	$1,175,775	$1,089,198	$1,147,057	$991,459
Inpatient Admissions	$441,768	$381,730	$477,886	$338,695	$349,575	$357,226	$297,303
Total	**$1,386,822**	**$1,455,178**	**$1,669,694**	**$1,514,470**	**$1,438,773**	**$1,504,283**	**$1,288,762**
	Inflation-Adjusted Average Cost Per Visit						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$398	$475	$528	$548	$543	$618	$592
Inpatient Admissions	$10,040	$9,543	$11,114	$10,263	$9,710	$9,401	$10,252
Total	**$573**	**$633**	**$725**	**$696**	**$705**	**$794**	**$757**

[3] The analysis of dual-eligible adults (Exhibit 8) is focused on adults between 21 to 64 years of age, because the pilot program grants dental benefits to this group. Information for the entire adult dual-eligible population is available in Appendix 3.

Implications for Policymakers

Our analysis underscores why expanding dental benefits to Medicaid participants is an opportunity for policy change to reduce ED visits for NTDCs. Although Medicaid members comprise only 17% of Maryland adults, they account for 54% of all the state's ED visits for NTDCs and 46% of total cost. Clearly, the Medicaid program pays a disproportionate share of the cost of ED visits for dental conditions.

Maryland's pilot program offers basic dental benefits for DEAs — adults who are members of both Medicaid and Medicare. As this report indicates, ED visits for NTDCs among all Maryland adults fell in the first year of the pilot that expanded dental benefits. These visits also dropped among DEAs, and this decline is particularly encouraging because this group has higher rates of chronic disease than the overall adult population. However, there is not yet sufficient evidence that this drop was associated with the expansion of dental benefits to this population, and we will continue to monitor the trends over time.

Regardless, improving the quality of dental coverage for DEAs and/or other adults offers them a much less costly option for care that can prevent oral diseases or treat these infections before they become more serious or even life-threatening. Improving the range of covered dental services may well be one factor lowering the rate of ED visits by Maryland adults, improving health outcomes and leading to significant cost savings for the state Medicaid program.

Maryland ED statistics reflect what other states' data tend to show: younger adults are much more likely to visit hospital EDs for NTDCs than older adults. In 2019, the rate of visits among adults aged 20-34 was more than double the rate among those aged 45 or older. This suggests that states seeking to reduce ED visits could make greater progress toward reducing costs associated with ED visits for NTDCs by improving the quality of Medicaid dental benefits for all eligible members, as opposed to focusing on subgroups that are older or that have a higher prevalence of chronic diseases. Considering that Maryland's ED rate for NTDCs remains much higher than the national rate, state policymakers might need to implement broader improvements in adult dental coverage to close this gap.

As states adopt changes in adult dental coverage, additional research can strengthen our knowledge of the link that seems to exist between improvements in adult benefits and a reduction in ED visits. Legislators and other state policymakers should monitor reports of these and similar data, recognizing that curbing ED visits for NTDCs is one way to reduce an unnecessary drain on state Medicaid budgets.

Appendix 1: Non-Traumatic Dental Condition Diagnosis Codes

ASTDD Measure

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
5200	Anodontia	**K000**	
5201	Supernumerary teeth	**K001**	
5202	Abnormalities of size and form of teeth	**K002**	
5203	Mottled teeth	**K003**	
5204	Disturbances of tooth formation	**K004**	
5205	Hereditary disturbances in tooth structure, not elsewhere classified	**K005**	
5206	Disturbances in tooth eruption	**K006**	Disturbances in tooth eruption
		K01	Embedded and impacted teeth
		K010	Embedded teeth
		K011	Impacted teeth
5207	Teething syndrome	**K007**	
5208	Other specified disorders of tooth development and eruption	**K008**	Other disorders of tooth development
		K00	Disorders of tooth development and eruption
5209	Unspecified disorder of tooth development and eruption	**K009**	
52100	Dental caries, unspecified	**K02**	Dental caries
52109	Other dental caries	**K029**	Dental caries, unspecified
52106	Dental caries pit and fissure	**K025**	
52101	Dental caries limited to enamel	**K0251**	Dental caries on pit and fissure surface limited to enamel
52102	Dental caries extending into dentine	**K0252**	Dental caries on pit and fissure surface penetrating into dentin
52103	Dental caries extending into pulp	**K0253**	Dental caries on pit and fissure surface penetrating into pulp
52104	Arrested dental caries	**K023**	
52105	Odontoclasia	**K0389**	Other specified diseases of hard tissues of teeth
52107	Dental caries of smooth surface	**K026**	Dental caries on smooth surface
		K0261	Dental caries on smooth surface limited to enamel
		K0262	Dental caries on smooth surface penetrating into dentin
		K0263	Dental caries on smooth surface penetrating into pulp
52108	Dental caries of root surface	**K027**	Dental root caries
		K03	Other diseases of hard tissues of teeth
52110	Excessive dental attrition, unspecified	**K030**	Excessive attrition of teeth
52111	Excessive attrition, limited to enamel		
52112	Excessive attrition, extending into dentine		
52113	Excessive attrition, extending into pulp		
52114	Excessive attrition, localized		
52115	Excessive attrition, generalized		

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
52120	Abrasion of teeth, unspecified	**K031**	Abrasion of teeth
52121	Abrasion, limited to enamel		
52122	Abrasion, extending into dentine		
52123	Abrasion, extending into pulp		
52124	Abrasion, localized		
52125	Abrasion, generalized		
52130	Erosion, unspecified	**K032**	Erosion of teeth
52131	Erosion, limited to enamel		
52132	Erosion, extending into dentine		
52133	Erosion, extending into pulp		
52134	Erosion, localized		
52135	Erosion, generalized		
52140	Pathological resorption, unspecified	**K033**	Pathological resorption of teeth
52141	Pathological resorption, internal		
52142	Pathological resorption, external		
52149	Other pathological resorption		
5215	Hypercementosis	**K034**	
5216	Ankylosis of teeth	**K035**	
5217	Intrinsic post eruptive color changes of teeth	**K037**	
52181	Cracked tooth	**K0381**	
52189	Other specific diseases of hard tissues of teeth	**K038**	
		K0389	
5219	Unspecified disease of hard tissues of teeth	**K039**	Disease of hard tissues of teeth, unspecified
5220	Pulpitis	**K04**	Diseases of pulp and periapical tissues
		K040	Pulpitis
		K0401	Reversible pulpitis
		K0402	Irreversible pulpitis
5221	Necrosis of the pulp	**K041**	
5222	Pulp degeneration	**K042**	
5223	Abnormal hard tissue formation in pulp	**K043**	
5224	Acute apical periodontitis of pulpal origin	**K044**	
5226	Chronic apical periodontitis	**K045**	
5227	Periapical abscess with sinus	**K046**	
5225	Periapical abscess without sinus	**K047**	
5228	Radicular cyst	**K048**	
5229	Other and unspecified diseases of pulp and periapical tissues	**K049**	Other and unspecified diseases of pulp and periapical tissues
		K0490	Unspecified diseases of pulp and periapical tissues
		K0499	Other diseases of pulp and periapical tissues

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
		K05	Gingivitis and periodontal diseases
52300	Acute gingivitis, plaque induced	K050	Acute gingivitis
		K0500	Acute gingivitis, plaque induced
52301	Acute gingivitis, non-plaque induced	K0501	Acute gingivitis, non-plaque induced
52310	Chronic gingivitis, plaque induced	K051	Chronic gingivitis
		K0510	Chronic gingivitis, plaque induced
52311	Chronic gingivitis, non-plaque induced	K0511	Chronic gingivitis, non-plaque induced
		K06	Other disorders of gingiva and edentulous alveolar ridge
52320	Gingival recession, unspecified	K060	Gingival recession
		K06010	Localized gingival recession, unspecified
52321	Gingival recession, minimal	K06011	Localized gingival recession, minimal
52322	Gingival recession, moderate	K06012	Localized gingival recession, moderate
52323	Gingival recession, severe	K06013	Localized gingival recession, severe
52324	Gingival recession, localized	K0601	Gingival recession, localized
		K0602	Gingival recession, generalized
		K06020	Generalized gingival recession, unspecified
52325	Gingival recession, generalized	K06021	Generalized gingival recession, minimal
		K06022	Generalized gingival recession, moderate
		K06023	Generalized gingival recession, severe
52330	Aggressive periodontitis, unspecified	K052	Aggressive periodontitis
52333	Acute periodontitis	K0520	Aggressive periodontitis, unspecified
		K0521	Aggressive periodontitis, localized
		K05211	Aggressive periodontitis, localized, slight
52331	Aggressive periodontitis, localized	K05212	Aggressive periodontitis, localized, moderate
		K05213	Aggressive periodontitis, localized, severe
		K05219	Aggressive periodontitis, localized, unspecified severity
		K0522	Aggressive periodontitis, generalized
		K05221	Aggressive periodontitis, generalized, slight
52332	Aggressive periodontitis, generalized	K05222	Aggressive periodontitis, generalized, moderate
		K05223	Aggressive periodontitis, generalized, severe
		K05229	Aggressive periodontitis, generalized, unspecified severity
52340	Chronic periodontitis, unspecified	K053	Chronic periodontitis
		K0530	Chronic periodontitis, unspecified
		K0531	Chronic periodontitis, localized
		K05311	Chronic periodontitis, localized, slight
52341	Chronic periodontitis, localized	K05312	Chronic periodontitis, localized, moderate
		K05313	Chronic periodontitis, localized, severe
		K05319	Chronic periodontitis, localized, unspecified severity

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
52342	Chronic periodontitis, generalized	**K0532**	Chronic periodontitis, generalized
		K05321	Chronic periodontitis, generalized, slight
		K05322	Chronic periodontitis, generalized, moderate
		K05323	Chronic periodontitis, generalized, severe
		K05329	Chronic periodontitis, generalized, unspecified severity
5235	Periodontosis	**K054**	
		K0540	
5236	Accretions on teeth	**K036**	Deposits [accretions] on teeth
5238	Other specified periodontal diseases	**K055**	Other periodontal diseases
		K061	Gingival enlargement
		K063	Horizontal alveolar bone loss
		K068	Other specified disorders of gingiva and edentulous alveolar ridge
5239	Unspecified gingival and periodontal disease	**K056**	Periodontal disease, unspecified
		K069	Disorder of gingiva and edentulous alveolar ridge, unspecified
52400	Major anomalies of jaw size, unspecified anomaly	**M26**	Dentofacial anomalies [including malocclusion]
		M260	Major anomalies of jaw size
		M2600	Unspecified anomaly of jaw size
52401	Major anomalies of jaw size, maxillary hyperplasia	**M2601**	Maxillary hyperplasia
52402	Major anomalies of jaw size, mandibular hyperplasia	**M2603**	Mandibular hyperplasia
52403	Major anomalies of jaw size, maxillary hypoplasia	**M2602**	Maxillary hypoplasia
52404	Major anomalies of jaw size, mandibular hypoplasia	**M2604**	Mandibular hypoplasia
52405	Major anomalies of jaw size, macrogenia	**M2605**	Macrogenia
52406	Major anomalies of jaw size, microgenia	**M2606**	Microgenia
52407	Excessive tuberosity of jaw	**M2607**	Excessive tuberosity of jaw
52409	Major anomalies of jaw size, other specified anomaly	**M2609**	Other specified anomalies of jaw size
52410	Anomalies of relationship of jaw to cranial base, unspecified anomaly	**M261**	Anomalies of jaw-cranial base relationship
		M2610	Unspecified anomaly of jaw-cranial base relationship
52411	Anomalies of relationship of jaw to cranial base, maxillary asymmetry	**M2611**	Maxillary asymmetry
52412	Anomalies of relationship of jaw to cranial base, other jaw asymmetry	**M2612**	Other jaw asymmetry
52419	Anomalies of relationship of jaw to cranial base, other specified anomaly	**M2619**	Other specified anomalies of jaw-cranial base relationship
52420	Unspecified anomaly of dental arch relationship	**M262**	Anomalies of dental arch relationship
		M2620	Unspecified anomaly of dental arch relationship

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
52421	Malocclusion, Angle's class I	**M2621**	Malocclusion, Angle's class
		M26219	Malocclusion, Angle's class unspecified
		M26211	Malocclusion, Angle's class I
52422	Malocclusion, Angle's class II	**M26212**	
52423	Malocclusion, Angle's class III	**M26213**	
52424	Open anterior occlusal relationship	**M2622**	Open occlusal relationship
		M26220	Open anterior occlusal relationship
52425	Open posterior occlusal relationship	**M26221**	Open posterior occlusal relationship
52426	Excessive horizontal overlap	**M2623**	
52427	Reverse articulation	**M2624**	
52428	Anomalies of interarch distance	**M2625**	Anomalies of interarch distance
52429	Other anomalies of dental arch relationship	**M2629**	Other anomalies of dental arch relationship
52430	Unspecified anomaly of tooth position of fully erupted teeth	**M263**	Anomalies of tooth position of fully erupted tooth or teeth
		M2630	Unspecified anomaly of tooth position of fully erupted tooth/teeth
52431	Crowding of teeth	**M2631**	Crowding of fully erupted teeth
52432	Excessive spacing of teeth	**M2632**	Excessive spacing of fully erupted teeth
52433	Horizontal displacement of teeth	**M2633**	Horizontal displacement of fully erupted tooth or teeth
52434	Vertical displacement of teeth	**M2634**	Vertical displacement of fully erupted tooth or teeth
52435	Rotation of tooth/teeth	**M2635**	Rotation of fully erupted tooth or teeth
52436	Insufficient interocclusal distance of teeth (ridge)	**M2636**	Insufficient interocclusal distance of fully erupted teeth
52437	Excessive interocclusal distance of teeth	**M2637**	Excessive interocclusal distance of fully erupted teeth
52439	Other anomalies of tooth position	**M2639**	Other anomalies of tooth position of fully erupted tooth/teeth
5244	Malocclusion, unspecified	**M264**	Malocclusion, unspecified
52450	Dentofacial functional abnormality, unspecified	**M265**	Dentofacial functional abnormalities
		M2650	Dentofacial function abnormalities, unspecified
52451	Abnormal jaw closure	**M2651**	Abnormal jaw closure
52452	Limited mandibular range of motion	**M2652**	Limited mandibular range of motion
52453	Deviation in opening and closing of the mandible	**M2653**	Deviation in opening and closing of the mandible
52454	Insufficient anterior guidance	**M2654**	Insufficient anterior guidance
52455	Centric occlusion maximum intercuspation discrepancy	**M2655**	Centric occlusion maximum intercuspation discrepancy
52456	Non-working side interference	**M2656**	Non-working side interference
52457	Lack of posterior occlusal support	**M2657**	Lack of posterior occlusal support
52459	Other dentofacial functional abnormalities	**M2659**	Other dentofacial functional abnormalities

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
52460	Temporomandibular joint disorders, unspecified	**M266**	Temporomandibular joint disorders
		M2660	Temporomandibular joint disorder, unspecified
		M26601	Right temporomandibular joint disorder, unspecified
		M26602	Left temporomandibular joint disorder, unspecified
		M26603	Bilateral temporomandibular joint disorder, unspecified
		M26609	Unspecified TMJ joint disorder, unspecified side
52461	Temporomandibular joint disorders, adhesions and ankylosis (bony or fibrous)	**M2661**	Adhesions and ankylosis of temporomandibular joint
		M26611	Adhesions and ankylosis of right temporomandibular joint
		M26612	Adhesions and ankylosis of left temporomandibular joint
		M26613	Adhesions and ankylosis of bilateral temporomandibular joint
		M26619	Adhesions and ankylosis of TMJ joint, unspecified side
52462	Temporomandibular joint disorders, arthralgia of temporomandibular joint	**M2662**	Arthralgia of temporomandibular joint
		M26621	Arthralgia of right temporomandibular joint
		M26622	Arthralgia of left temporomandibular joint
		M26623	Arthralgia of bilateral temporomandibular joint
		M26629	Arthralgia of temporomandibular joint, unspecified side
52463	Temporomandibular joint disorders, articular disc disorder (reducing or non-reducing)	**M2663**	Articular disc disorder of temporomandibular joint
		M26631	Articular disc disorder of right temporomandibular joint
		M26632	Articular disc disorder of left temporomandibular joint
		M26633	Articular disc disorder of bilateral temporomandibular joint
		M26639	Articular disc disorder of TMJ joint, unspecified side
52464	Temporomandibular joint sounds on opening and/or closing the jaw	**M2669**	Other specified disorders of temporomandibular joint
52469	Other specified temporomandibular joint disorders		
52470	Dental alveolar anomalies, unspecified alveolar anomaly	**M267**	Dental alveolar anomalies
		M2670	Unspecified alveolar anomaly
52471	Alveolar maxillary hyperplasia	**M2671**	
52472	Alveolar mandibular hyperplasia	**M2672**	
52473	Alveolar maxillary hypoplasia	**M2673**	
52474	Alveolar mandibular hypoplasia	**M2674**	
52475	Vertical displacement of alveolus and teeth	**M2679**	Other specified alveolar anomalies
52476	Occlusal plane deviation		
52479	Other specified alveolar anomaly		
52481	Anterior soft tissue impingement	**M2681**	
52482	Posterior soft tissue impingement	**M2682**	
52489	Other specified dentofacial anomalies	**M268**	Other dentofacial anomalies
		M2689	Other dentofacial anomalies
5249	Unspecified dentofacial anomalies	**M269**	Dentofacial anomaly, unspecified

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
5250	Exfoliation of teeth due to systemic causes	**K080**	Exfoliation of teeth due to systemic causes
52510	Acquired absence of teeth, unspecified	**K08109**	Complete loss of teeth, unspecified cause, unspecified class
52512	Loss of teeth due to periodontal disease	**K0812**	Complete loss of teeth due to periodontal diseases
		K08121	Complete loss of teeth due to periodontal disease, class I
		K08122	Complete loss of teeth due to periodontal disease, class II
		K08123	Complete loss of teeth due to periodontal disease, class III
		K08124	Complete loss of teeth due to periodontal disease, class IV
		K08129	Complete loss of teeth due to periodontal disease, unspecified class
		K0842	Partial loss of teeth due to periodontal diseases
		K08421	Partial loss of teeth due to periodontal diseases, class I
		K08422	Partial loss of teeth due to periodontal diseases, class II
		K08423	Partial loss of teeth due to periodontal diseases, class III
		K08424	Partial loss of teeth due to periodontal diseases, class IV
		K08429	Partial loss of teeth due to periodontal disease, unspecified class
52513	Loss of teeth due to caries	**K0813**	Complete loss of teeth due to caries
		K08131	Complete loss of teeth due to caries, class I
		K08132	Complete loss of teeth due to caries, class II
		K08133	Complete loss of teeth due to caries, class III
		K08134	Complete loss of teeth due to caries, class IV
		K08139	Complete loss of teeth due to caries, unspecified class
		K0843	Partial loss of teeth due to caries
		K08431	Partial loss of teeth due to caries, class I
		K08432	Partial loss of teeth due to caries, class II
		K08433	Partial loss of teeth due to caries, class II
		K08434	Partial loss of teeth due to caries, class III
		K08439	Partial loss of teeth due to caries, unspecified class
52519	Other loss of teeth	**K0819**	Complete loss of teeth due to other specified cause
		K08191	Complete loss of teeth due to other specified cause, class I
		K08192	Complete loss of teeth due to other specified cause, class II
		K08193	Complete loss of teeth due to other specified cause, class III
		K08194	Complete loss of teeth due to other specified cause, class IV
		K08199	Complete loss of teeth due to other specified cause, unspecified class
		K0849	Partial loss of teeth due to other specified cause
		K08491	Partial loss of teeth due to other specified cause, class I

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
		K08492	Partial loss of teeth due to other specified cause, class II
		K08493	Partial loss of teeth due to other specified cause, class III
		K08494	Partial loss of teeth due to other specified cause, class IV
		K08499	Partial loss of teeth due to other cause, unspecified class
52520	Unspecified atrophy of edentulous alveolar ridge	**K082**	Atrophy of edentulous alveolar ridge
		K0820	Unspecified atrophy of edentulous alveolar ridge
52521	Minimal atrophy of the mandible	**K0821**	
52522	Moderate atrophy of the mandible	**K0822**	
52523	Severe atrophy of the mandible	**K0823**	
52524	Minimal atrophy of the maxilla	**K0824**	
52525	Moderate atrophy of the maxilla	**K0825**	
52526	Severe atrophy of the maxilla	**K0826**	
5253	Retained dental root	**K083**	
52540	Complete edentulism, unspecified	**K081**	Complete loss of teeth
		K0810	Complete loss of teeth, unspecified cause
52541	Complete edentulism, class I	**K08101**	Complete loss of teeth, unspecified cause, class I
52542	Complete edentulism, class II	**K08102**	Complete loss of teeth, unspecified cause, class II
52543	Complete edentulism, class III	**K08103**	Complete loss of teeth, unspecified cause, class III
52544	Complete edentulism, class IV	**K08104**	Complete loss of teeth, unspecified cause, class IV
52550	Partial edentulism, unspecified	**K084**	Partial loss of teeth
		K0840	Partial loss of teeth, unspecified cause
		K08409	Partial loss of teeth, unspecified cause, unspecified class
52551	Partial edentulism, class I	**K08401**	Partial loss of teeth, unspecified, class I
52552	Partial edentulism, class II	**K08402**	Partial loss of teeth, unspecified, class II
52553	Partial edentulism, class III	**K08403**	Partial loss of teeth, unspecified, class II
52554	Partial edentulism, class IV	**K08404**	Partial loss of teeth, unspecified, class IV
52560	Unspecified unsatisfactory restoration of tooth	**K0850**	Unsatisfactory restoration of tooth, unspecified
52561	Open restoration margins	**K0851**	Open restoration margins of tooth
52562	Unrepairable overhanging of dental restorative materials	**K0852**	
52563	Fractured dental restorative material without loss of material	**K0853**	Fractured dental restorative material
		K08530	Fractured dental restorative material without loss of material
52564	Fractured dental restorative material with loss of material	**K08531**	
52565	Contour of existing restoration of tooth biologically incompatible with oral health	**K0854**	
52566	Allergy to existing dental restorative material	**K0855**	
52567	Poor aesthetics of existing restoration	**K0856**	

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
52569	Other unsatisfactory restoration of existing tooth	**K08539**	Fracture dental restorative material, unspecified
		K0859	Other unsatisfactory restoration of tooth
52571	Osseointegration failure of dental implant	**M276**	Endosseous dental implant failure
		M2761	
52572	Post-osseointegration biological failure of dental implant	**M2762**	
52573	Post-osseointegration mechanical failure of dental implant	**M2763**	
52579	Other endosseous dental implant failure	**M2769**	
	Other specified disorders of the teeth and supporting structures	**K088**	Other specified disorders of teeth and supporting structures
		K0889	Other specified disorders of teeth and supporting structures
5259	Unspecified disorder of the teeth and supporting structures	**K089**	Disorder of teeth and supporting structures, unspecified
5260	Developmental odontogenic cysts	**K09**	Cysts of oral region, not elsewhere classified
		K090	Developmental odontogenic cysts
5261	Fissural cysts of jaw	**K091**	Developmental (nonodontogenic) cysts of oral region
5262	Other cysts of jaws	**M274**	Other and unspecified cysts of jaw
		M2740	Unspecified cyst of jaw
		M2749	Other cyst s of jaw
5263	Central giant cell (reparative) granuloma	**M271**	Giant cell granuloma, central
5264	Inflammatory conditions of jaw	**M272**	Inflammatory conditions of jaws
5265	Alveolitis of jaw	**M273**	Alveolitis of jaws
52661	Perforation of root canal space	**M275**	Periradicular pathology associated with previous endodontic treatment
		M2751	
52662	Endodontic overfill	**M2752**	
52663	Endodontic underfill	**M2753**	
52669	Other periradicular pathology associated with previous endodontic treatment	**M2759**	Other periradicular pathology associated with preventive endodontic treatment
52681	Exostosis of jaw	**M278**	Other specified diseases of jaws
52689	Other specified diseases of the jaws	**M27**	Other diseases of jaws
		M270	Developmental disorders of jaws
		M278	Other specified diseases of jaws
5269	Unspecified disease of the jaws	**M279**	Disease of jaws, unspecified
		M7911	Myalgia of mastication muscle
5270	Atrophy of salivary gland	**K11**	Diseases of salivary glands
		K110	Atrophy of salivary gland
5271	Hypertrophy of salivary gland	**K111**	Hypertrophy of salivary gland

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
5272	Sialoadenitis	K112	Sialoadenitis
		K1120	Sialodenitis, unspecified
		K1121	Acute sialoadenitis
		K1122	Acute recurrent sialoadenitis
		K1123	Chronic sialoadenitis
5273	Abscess of salivary gland	K113	
5274	Fistula of salivary gland	K114	
5275	Sialolithiasis	K115	
5276	Mucocele of salivary gland	K116	
5277	Disturbance of salivary secretion	K117	
5278	Other specified diseases of the salivary glands	R682	Dry mouth, unspecified
		K118	Other diseases of salivary glands
5279	Unspecified disease of the salivary glands	K119	Disease of salivary gland, unspecified
52800	Stomatitis and mucositis, unspecified	K12	Stomatitis and related lesions
		K123	Oral mucositis (ulcerative)
		K1230	Oral mucositis (ulcerative), unspecified
52801	Mucositis (ulcerative) due to antineoplastic therapy	K1231	Oral mucositis (ulcerative), due to antineoplastic therapy
52801	Mucositis (ulcerative) due to antineoplastic therapy	K1233	Oral mucositis (ulcerative), due to radiation
52802	Mucositis (ulcerative) due to other drugs	K1232	Oral mucositis (ulcerative), due to other drugs
52809	Other stomatitis and mucositis (ulcerative)	K121	Other forms of stomatitis
		K1239	Other oral mucositis (ulcerative)
5281	Cancrum oris	A690	Necrotizing ulcerative stomatitis
5282	Oral aphthae	K120	Recurrent oral aphtae
5283	Cellulitis and abscess of oral soft tissues	K122	Cellultis and abscess of mouth
5284	Cysts of oral soft tissues	K098	Other cyst of oral region, not elsewhere classified
		K099	Cyst of oral region, unspecified
5285	Diseases of lips	K130	Disease of lips
5286	Leukoplakia of oral mucosa, including tongue	K132	
		K1321	Leukoplakia and other disturbances of oral epithelium, including tongue
52871	Minimal keratinized residual ridge mucosa	K1322	Minimal keratinized residual ridge mucosa
52872	Excessive keratinized residual ridge mucosa	K1323	Excessive keratinized residual ridge mucosa
52879	Other disturbances of oral epithelium, including tongue	K1329	Other disturbances of oral epithelium, including tongue
		K1324	Leukokeratosis nicotina palati
5288	Oral submucosal fibrosis, including of tongue	K135	Oral submucous fibrosis

ICD-9 Code	ICD- 9 Description	ICD-10 Code	ICD-10 Description
5289	Other and unspecified diseases of the oral soft tissues	**K13**	Other diseases of lip and oral mucosa
		K131	Cheek and lip biting
		K133	Hairy leukoplakia
		K134	Granuloma and granuloma-like lesions of oral mucosa
		K136	Irritative hyperplasia of oral mucosa
		K137	Other and unspecified lesions of oral mucosa
		K1370	Unspecified lesions of oral mucosa
		K1379	Other lesions of oral mucosa
5290	Glossitis	**K14**	Glossitis
		K140	Glossitis
5291	Geographic tongue	**K141**	Geographic tongue
5292	Median rhomboid glossitis	**K142**	Median rhomboid glossitis
5293	Hypertrophy of tongue papillae	**K143**	Hypertrophy of tongue papillae
5294	Atrophy of tongue papillae	**K144**	Atrophy of tongue papillae
5295	Plicated tongue	**K145**	Plicated tongue
5296	Glossodynia	**K146**	Glossodynia
5298	Other specified conditions of the tongue	**K148**	Other diseases of tongue
5299	Unspecified condition of the tongue	**K149**	Disease of tongue, unspecified
78492	Jaw pain	**R6884**	Jaw pain
7924	Nonspecific abnormal findings in saliva	**R859**	Unspecified abnormal finding in specimens from digestive organs and abdominal cavity
V523	Fitting and adjustment of dental prosthetic device	**Z463**	Encounter for fitting and adjustment of dental prosthetic device
V534	Fitting and adjustment of orthodontic devices	**Z464**	Encounter for fitting and adjustment of orthodontic device
V585	Orthodontics aftercare		
	Dental examination	**Z012**	Encounter for dental examination and cleaning
V722		**Z0120**	Encounter for dental examination and cleaning without abnormal findings
V723		**Z0121**	Encounter for dental examination and cleaning with abnormal findings

DQA Measure

Ambulatory Care Sensitive Non-Traumatic Dental Condition ICD-9-CM and ICD-10-CM Diagnosis Codes

ICD9	ICD10
528.79	K13.29
528.8	K13.5
528.9	K13.70
	K13.79
	K13.1
	K13.6
	K13.4
529	K14.0
529.1	K14.1
529.2	K14.2
529.3	K14.3
529.4	K14.4
529.5	K14.5
529.6	K14.6
529.8	K14.8
529.9	K14.9
V52.3	Z46.3
V53.4	Z46.4
V58.5	Z46.4
V72.2	Z01.20
V72.3	Z01.21
784.92	R68.84
526.9	M27.0
527.0	K11.0
527.1	K11.1
527.2	K11.20
	K11.21
	K11.23
527.3	K11.3
527.4	K11.4
527.5	K11.5
527.6	K11.6
527.7	K11.7
	R68.2
527.8	K11.8
527.9	K11.9
528.00	K12.2
	K12.30
528.01	K12.31
	K12.33
528.02	K12.32
528.09	K12.1
	K12.39
528.1	A69.0
101	A69.0
	A69.1
528.2	K12.0
528.3	K12.2
528.4	K09.8
	K099
528.5	K13.0
528.6	K13.21
528.71	K13.22
528.72	K13.23
525.64	K08.531
525.65	K08.54
525.66	K08.55
525.67	K08.56
525.69	K08.59
525.71	M27.61

ICD9	ICD10
525.72	M27.62
525.73	M27.63
525.79	M27.69
525.8	K08.8
	K08.89
	M26.79
525.9	K08.9
526.0	K09.0
526.1	K09.1
526.2	M27.49
	M27.40
526.3	M27.1
526.4	M27.2
526.5	M27.3
526.61	M27.51
526.62	M27.52
526.63	M27.53
526.69	M27.59
526.81	M27.8
526.89	M27.8
526.9	M27.9
525.2	K08.20
525.21	K08.21
525.22	K08.22
525.23	K08.23
525.24	K08.24
525.25	K08.25
525.26	K08.26
525.3	K08.3
525.4	K08.109
	K08.139
	K08.199

ICD9	ICD10
525.41	K08.101
	K08.191
525.42	K08.102
525.43	K08.103
525.44	K08.104
525.5	K08.409
525.51	K08.401
	K08.431
525.52	K08.402
525.53	K08.403
525.54	K08.404
525.6	K08.50
525.61	K08.51
525.62	K08.52
525.63	K08.530
	M26.632
	M26.633
	M26.639
524.64	M26.69
524.69	M26.69
524.7	M26.70
524.71	M26.71
524.72	M26.72
524.73	M26.73
524.74	M26.74
524.75	M26.79
524.76	M26.79
524.79	M26.79
524.81	M26.81
524.82	M26.82
524.89	M26.4
	M26.89
524.9	M26.9

ICD9	ICD10
525.0	K08.0
525.1	K08.109
525.12	K08.429
525.13	K08.439
	K08.139
	K08.431
525.19	K08.499
	K08.191
	K08.199
524.37	M26.37
524.39	M26.39
524.4	M26.4
524.5	M26.50
524.51	M26.51
524.52	M26.52
524.53	M26.53
524.54	M26.54
524.55	M26.55
524.56	M26.56
524.57	M26.57
524.59	M26.59
524.6	M26.60
	M26.601
	M26.602
	M26.603
	M26.609
	M26.69
524.61	M26.61
	M26.621
	M26.622
	M26.623
	M26.629
524.62	M26.62
524.63	M26.63
	M26.631
524.02	M26.03
524.03	M26.02
524.04	M26.04
524.05	M26.05
524.06	M26.06
524.07	M26.07
524.09	M26.09
524.1	M26.10
524.11	M26.11
524.12	M26.12
524.19	M26.19
524.2	M26.20
524.21	M26.211
524.22	M26.212
524.23	M26.213
524.24	M26.220
524.25	M26.221
524.26	M26.23
524.27	M26.24
524.28	M26.25
524.29	M26.29
524.3	M26.30
524.31	M26.31
524.32	M26.32
524.33	M26.33
524.34	M26.34
524.35	M26.35
524.36	M26.36
523.31	K052.12
	K052.13
	K052.19

ICD9	ICD10
523.32	K05.22
	K052.21
	K052.22
	K052.23
	K052.29
523.33	K05.20
523.4	K05.30
523.41	K05.31
	K053.11
	K053.12
	K053.13
	K053.19
523.42	K05.32
	K053.21
	K053.22
	K053.23
	K053.29
523.5	K05.4
	K05.40
523.6	K03.6
523.8	K05.5
	K06.1
	K06.3
	K06.8
523.9	K05.6
	K06.9
524.00	M26.00
524.01	M26.01
521.9	K03.9
522.0	K04.0
	K04.01
	K04.02
522.1	K04.1
522.2	K04.2
522.3	K04.3
522.4	K04.4
522.5	K04.7
522.6	K04.5
522.7	K04.6
522.8	K04.8
522.9	K04.90
	K04.99
523.00	K05.00
523.01	K05.01
523.10	K05.10
523.11	K05.11
523.20	K06.0
	K060.10
	K060.20
523.21	K06.0
	K060.11
	K060.21
523.22	K06.0
	K060.12
	K060.22
523.23	K06.0
	K06013
	K06023
523.24	K06.0
	K060.10
523.25	K06.0
	K060.20
523.30	K05.20

ICD9	ICD10
523.31	K05.21
	K052.11
521.06	K02.52
	K02.53
521.07	K02.61
	K02.62
	K02.63
521.08	K02.7
521.09	K02.9
521.10	K03.0
521.11	
521.12	
521.13	
521.14	
521.15	
521.20	K03.1
521.21	
521.22	
521.23	
521.24	
521.25	
521.30	K03.2
521.31	
521.32	
521.33	
521.34	
521.35	
521.40	K03.3
521.41	
521.42	
521.49	
521.5	K03.4
521.6	K03.5

ICD9	ICD10
521.7	K03.7
521.81	K03.81
521.89	K03.89
520.0	K00.0
520.1	K00.1
520.2	K00.2
520.3	K00.3
520.4	K00.4
520.5	K00.5
520.6	K00.6
520.6	K01.0
520.6	K01.1
520.8	K00.8
520.9	K00.9
521.00	K02.9
521.01	K02.61
521.02	K02.52
521.02	K02.62
521.03	K02.53
521.03	K02.63
521.04	K02.3
521.05	K03.89
521.06	K02.51

Additional First-Listed ICD-9-CM/ICD-10-CM Diagnosis Codes to Identify Ambulatory Care Sensitive Non-Traumatic Dental Condition Visits when Paired with an Additional Listed Diagnosis Code from the Ambulatory Care Sensitive Non-Traumatic Dental Condition ICD-9-CM/ICD-10-CM Codes in Table 1

ICD9	ICD10
682.0	L03.211
	L03.212
	L03.213
682.1	L03.221
	L03.222
784.2	R22.0
	R22.1

Appendix 2: Comparing Measures of ED Visits for Dental Conditions

At the time of our earlier reports on ED visits for dental conditions in Maryland, there were no widely used or endorsed measures of ED visits for dental conditions. Therefore, the existing academic literature was used to create a measure of chronic dental conditions. In the time since those reports were released, two measures have been developed by national organizations: one by the Association of State and Territorial Dental Directors (ASTDD) that assesses non-traumatic dental conditions (NTDC) and another by the Dental Quality Alliance (DQA) that assesses Ambulatory Care Sensitive Emergency Department Visits. The ASTDD measure, in particular, has een widely adopted and is used in most recent publications on ED visits for dental conditions.

The three measures differ in the specific diagnosis codes included in the definition, the number of diagnosis codes used, and how ED visits are differentiated from visits to the hospital for other reasons (inpatient admissions, ambulatory surgeries, routine office visits, etc.). For example, the ASTDD measure uses a wide range of diagnosis codes, allows for the use of either the first listed or all diagnosis codes, and contains relatively little guidance on differentiating ED visits. On the other hand, the DQA measure uses a slightly more restrictive set of diagnosis codes, focuses on the first listed or primary diagnosis code, and contains clear guidance on differentiating ED visits from other types of hospital visits.

To ensure that the results presented in this report are substantively similar to prior reporting while, at the same time, ensuring that the results are in line with newly established scientific best practices and can be easily replicated with existing data, we adapted the measures as follows:

1. Used the DQA measure specifications to identify the encounter as an ED visit.
2. Used the diagnosis codes recommended by the ASTDD, as listed in Appendix 1.
3. Used the primary diagnosis and the first 15 listed secondary diagnosis codes, out of a possible 28.

There remains no broad consensus on how to measure inpatient admissions for dental conditions. Therefore, we combined the ASTDD NTDC measure and the DQA measure, including additional first listed diagnosis codes associated with cellulitis, lymphangitis, and abscess of face/neck or swelling mass or lump in head or neck, paired with either ASTDD- or DQA-recommended secondary diagnosis coded. The measure is similar to that used in our earlier report along with other reports that consider inpatient admissions.

Appendix 3: Emergency Department and Inpatient Admissions for Non-Traumatic Dental Conditions Among Dual-Eligible Adults Aged 21–64 in Maryland

	Count						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	2,629	2,542	2,586	2,509	2,378	2,246	2,133
Inpatient Admissions	53	52	56	45	45	51	36
Total	**2,682**	**2,594**	**2,642**	**2,554**	**2,423**	**2,297**	**2,169**
	Rate Per 10,000 Adult Dual-Eligible Population						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	211.9	193.9	189.2	175.7	164.0	153.0	143.8
Inpatient Admissions	4.3	4.0	4.1	3.2	3.1	3.5	2.4
Total	**216.2**	**197.9**	**193.3**	**178.8**	**167.1**	**156.5**	**146.2**
	Inflation-Adjusted Total Charges						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$1,093,061	$1,229,828	$1,457,719	$1,488,106	$1,387,111	$1,468,227	$1,376,121
Inpatient Admissions	$498,830	$527,497	$654,102	$478,798	$431,767	$475,238	$337,020
Total	**$1,591,891**	**$1,757,325**	**$2,111,821**	**$1,966,904**	**$1,818,878**	**$1,943,465**	**$1,713,141**
	Inflation-Adjusted Average Cost Per Visit						
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
ED Visits	$416	$484	$564	$593	$583	$654	$645
Inpatient Admissions	$9,412	$10,144	$11,680	$10,640	$9,595	$9,318	$9,362
Total	**$594**	**$677**	**$799**	**$770**	**$751**	**$846**	**$790**

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The Maryland Dental Action Coalition (MDAC), the state's leading non-governmental oral health policy and advocacy organization, works to improve the oral health of all Marylanders through increased oral health promotion, disease prevention, education, advocacy, and access to oral health care. MDAC leads the development of the five-year Maryland Oral Health Plan and partners with individuals and organizations working to develop and implement initiatives to improve the oral health of all Marylanders.
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