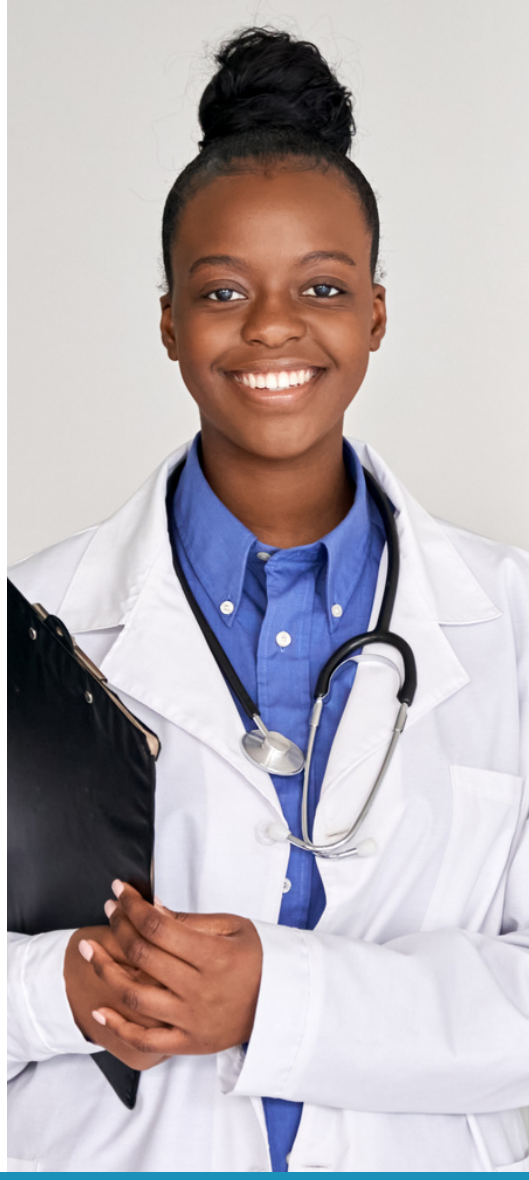

2022 VIRGINIA ORAL HEALTH REPORT CARD

Tracking Virginia's Performance on Key Oral Health Indicators

Virginia Health Catalyst
The Intersection of Overall Health and Oral Health

March 2023

www.vahealthcatalyst.org

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EXECUTIVE SUMMARY

Good oral health is essential to overall health and well-being for everyone across the lifespan. Poor oral health is linked to diabetes, heart disease, missed time at work and school – even premature birth. But not all people have equitable access to dental care or coverage. Virginia must address these oral health problems to become the healthiest state in the nation.

Virginia's overall grade for the 2022 *Oral Health Report Card*

The 2022 *Virginia Oral Health Report Card* compares Virginia's performance on nine key oral health indicators with national benchmarks, equipping advocates with a better understanding of where the Commonwealth thrives and needs improvement. The *Report Card* is a tool to track our progress, renew our focus, and spark innovations to improve oral health in Virginia.

When compared to national oral health data, Virginia earned a C+. The grades include the following:

The proportion of the population on fluoridated public water systems	A
The use of preventive dental services by children aged 3-20 in Medicaid The proportion of adults aged 18+ without dental coverage	B
The proportion of children aged 1-2 in Medicaid who received preventive dental services The proportion of people with live births who had their teeth cleaned during pregnancy The proportion of adults aged 45-64 who have lost at least one tooth because of tooth decay or gum disease	C
The proportion of Medicaid pediatric medical providers applying fluoride varnish **No national benchmark exists; therefore, Virginia receives an "NB" for no benchmark.*	NB*
The proportion of third graders who have experienced tooth decay The proportion of third graders who have dental sealants on permanent molars	*Coming soon*

Progress Since 2016

Virginia scored a C+ in the first *Oral Health Report Card* in 2016, but since then, there have been marked improvements to the Virginia oral health system. For example, in 2019, Virginia expanded enrollment eligibility for the Medicaid program, and a comprehensive adult dental benefit was added to Medicaid in 2021. Together, these statewide changes made health care, including oral health, more accessible and affordable for hundreds of thousands of Virginians and led to improvements in the rates of several *Report Card* indicators. Some of the data sources, however, do not account for these improvements since they were collected and reported on a lag (i.e. the latest information available is from 2019).

From Tool to Action

However, in order to make Virginia the healthiest state in the nation, **we must do better**. Systemic threats to health, like racism and unequal access to dental care or education, contribute to health inequities in Virginia. Data show differing oral health outcomes by race/ethnicity, income, education, disability, sexual orientation/gender identity, and geography in Virginia. Centering the communities facing oral health inequities will help us find realistic solutions to these inequities.

Together, equipped with the results of the 2022 *Report Card*, we can build upon existing work at the regional and state levels, grow stakeholder participation, and strategically allocate human and financial resources to create a more equitable public health care system and ultimately, a healthier Virginia.

2022 Virginia Oral Health REPORT CARD

Virginia earns a C+ when compared to the nation's performance on nine key oral health indicators. The good news? We can do better.

C+

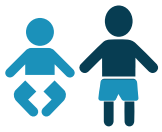
Oral health is overall health. Good oral health is important for a healthy body; poor oral health is linked to diabetes, heart disease, inability to learn and work, and even preterm birth. But dental disease is preventable. With renewed focus, investment, and innovation, Virginia can achieve the best oral health in the nation.

The table below outlines the nine key oral health indicators and Virginia's 2022 grade in green. See the reverse page for a comparison to the *2016 Report Card* and grading criteria.

27%

C

of children aged 1-2 had a preventive dental visit through Medicaid.



When children see the dentist by age one, it saves money and improves health outcomes.

59%

B

of children and teens aged 3-20 had a preventive dental visit through Medicaid.

Preventive dental visits are vital to maintaining healthy teeth and gums, laying the foundation for lifelong oral health.

Coming Soon

Third graders who experienced tooth decay.**

Tooth decay is the most common chronic disease of childhood - 5 times more prevalent than asthma.

Coming Soon

Third graders who have a dental sealant on their permanent molars.**

Sealants are among the most effective and inexpensive ways to prevent cavities.

3%

NB*

of Medicaid pediatric medical providers applied fluoride varnish last year.

The AAP recommends young children receive fluoride varnish as part of a well-child visit.

96%

A

of people on public water systems have fluoridated water.

Fluoridated water enables Virginians of all ages easy access to proven cavity prevention.

48%

C

of pregnant people had a cleaning during pregnancy.

Dental care is safe and necessary during pregnancy. Poor oral health can lead to negative birth outcomes, like low birth weight.

47%

C

of adults aged 45-64 lost at least one tooth because of tooth decay or gum disease.

Tooth loss can contribute to poor nutrition, lack of employment, and social isolation.

31%

B

of adults do not have dental coverage.

Adults with dental coverage are more likely to visit a dentist for preventive care and take their children to see a dentist.

*No national benchmark exists; therefore, Virginia receives an "NB" for no benchmark.
**Data collection delayed due to COVID-19 restrictions in schools.

Comparing 2016 and 2022 *Virginia Oral Health Report Card*

The table below identifies the rates and grades for the 2016 and 2022 indicators, and the change in rates between the two reporting periods.

Indicator	Change	2016 - 2022 (grade and rate)	Details
Medicaid children aged 1-2 with a preventive dental visit	Improvement	C 24% → C 27%	Higher rate of children with preventive dental visits
People on public water systems have fluoridated water	No change	A 96% → A 96%	Rate remained constant
Adults aged 45-64 with tooth loss	Improvement	C 50% → C 47%	Lower rate of adults with tooth loss
Adults without dental coverage	Improvement	C 38% → B 31%	Lower rate of adults without dental coverage
Third graders who have dental sealants on permanent molars	*Coming soon*	A 52%	Data collection delayed due to COVID-19 restrictions in schools
Third graders who experienced tooth decay	*Coming soon*	C 47%	Data collection delayed due to COVID-19 restrictions in schools

Changed Indicators

The three indicators in the table below cannot be compared due to methodological changes.

2016 Indicator	Grade Rate	2022 Indicator	Grade Rate	Details
Medicaid children and teens aged 1-20 with a preventive dental visit	C 53%	Medicaid children and teens aged 3-20 with a preventive dental visit	B 59%	Rates cannot be compared - age group changed from 2016 to 2022
Medicaid medical providers who applied fluoride varnish	NB 5%	Medicaid medical providers who applied fluoride varnish	NB 3%	Rates cannot be compared - data collection timeframe changed from 2016 to 2022
Pregnant people who visited the dentist	D 44%	Pregnant people who had a teeth cleaning	C 48%	Rates cannot be compared - survey item changed from 2016 to 2022

Technical Notes

Each indicator of the *Virginia Oral Health Report Card* is assigned a score based on how Virginia performs compared to a national benchmark. Letter grades are awarded for each indicator depending on how far above or below Virginia's percentage is relative to the national benchmark. The letter grades have certain point values associated with them, as described in the table to the right. Then, the overall grade for Virginia is calculated by averaging the points for all nine indicators.

Grade	Points	Criteria
A	4	≥20% better than national
B	3	10 to 20% better than national
C	2	0 to 10% change from national
D	1	10 to 20% worse than national
F	0	≥20% worse than national
NB	--	No national benchmark (NB); will monitor progress going forward

This project was funded by the Virginia Department of Health's Maternal and Child Health Services Block Grant.

INDICATORS

The *Report Card* indicators measure **prevention**, **coverage**, **collaboration**, and **health status**.

- **Prevention**: Preventive dental services, like teeth cleanings and dental sealants, help to maintain good oral health and prevent issues in the future.
- **Coverage**: Dental insurance is fundamental for sustaining good oral health because individuals without health coverage are more likely to forego or delay care due to concerns about cost.
- **Collaboration**: Because oral health plays a critical role in overall health, integrating oral health into medical care provides multiple opportunities for dental referrals and identifying oral health issues early.
- **Health Status**: Policymakers and advocates need to understand how healthy Virginians are now in order to make changes and track progress toward a healthier Commonwealth.

All indicators tie back to the 2015 Virginia Oral Health Plan, a roadmap developed by the Virginia Department of Health and other invested stakeholders to improve oral health in the Commonwealth. Though work group members chose the *Report Card* indicators through careful agreement during the development process, the correlation with the Virginia Oral Health Plan goals was intentional to ensure the *Report Card* activities support system-wide improvements and existing statewide initiatives.

The 2022 *Report Card* includes the following details for each indicator:

Background

Each indicator presents an important piece of the comprehensive picture of oral health in Virginia. The background sections explain their significance to health.

Grade & Trend

A diverse workgroup of invested stakeholders established the grading methodology. While robust, this method is subjective and is meant to raise awareness about oral health in the Commonwealth.

Where appropriate, the 2022 rates are compared to the 2016 rates, and any observable trend in relation to the national benchmarks are reported.

Focus on Equity

Oral health inequities must be considered when responding to the indicators in the *Report Card*. Any inequities in the available data are listed by demographic factors (race/ethnicity, income, geography, etc.).

Opportunities for Improvement

Progress is possible with so many active and engaged oral health advocates in Virginia. The opportunities for improvement listed for each indicator were gathered through stakeholder input in workgroup meetings, the 2022 Catalyst Annual Summit, and partner surveys. These are not exhaustive but are meant to spark innovative solutions.

Find detailed tables with indicator-specific data by year and demographic characteristics in **Appendix A**. Methodology (including grading), data sources, and other technical notes are provided in **Appendix B**.

Children aged 1-2 enrolled in Medicaid/FAMIS who received a preventive dental service

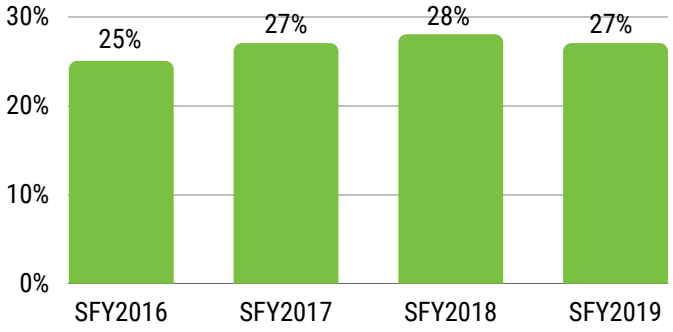
C

Background

Early childhood is critical for establishing a dental home and lifelong oral health; early dental care can also reduce care costs throughout childhood. The American Dental Association, American Public Health Association, American Academy of Pediatric Dentistry, and the American Academy of Pediatrics recommend that children receive their first dental visit within six months of their first tooth or no later than 12 months of age.

Grade & Trend

Virginia earned a C for this indicator. Just over a quarter (27%) of Virginia's children aged 1-2 in Medicaid/FAMIS received a preventive dental service, which is 2% higher than the national benchmark. The most recent data for this analysis is from the state fiscal year 2019. The graph at the right details the children aged 1-2 in Medicaid/FAMIS who received a preventive dental service in SFY 2016-2019.



2016 Report Card	2022 Report Card	Trend
24% (C)	27% (C)	Improvement

Focus on Equity

Children in Southwest Virginia (16%) had the lowest rates of preventive dental visits compared to other groups. It is notably lower than Virginia as a whole (27%) and the other four regions of the Commonwealth.

Opportunities for Improvement

- Remove deductible copay for preventive visits in place by some commercial insurance.
- Ensure Medicaid enrollees, providers, and community organizations know there are no copays with Medicaid dental coverage.
- Continue to strengthen screening services at early intervention organizations (e.g., Head Start sites).
- Engage primary care physicians to help parents understand the importance of early prevention; encourage education in oral health care as part of the well-child visit.
- Include information on the importance of dental homes for young children in prenatal education.
- Utilize local stakeholder organizations to promote the use of dental homes, Medicaid dental benefits, and oral health providers accepting patients in the area.

Children aged 3-20 enrolled in Medicaid/FAMIS who received a preventive dental service

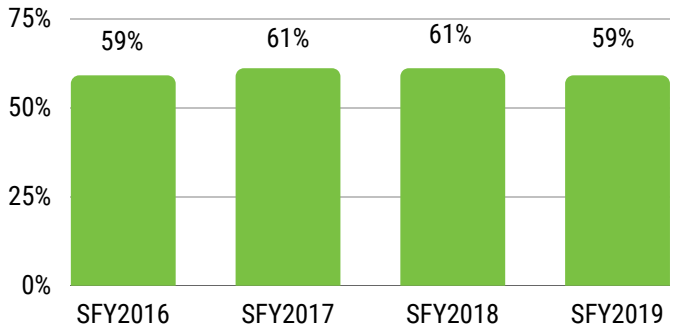
B

Background

Older children and adolescents' oral health risks can include a higher rate of cavities; poorer oral hygiene; poorer dietary habits; eating disorders and other unique behavioral health needs; higher propensity for traumatic injury and periodontal disease; fear of dental care; and potential substance use. Most children have all their adult teeth around age 12. Developing good oral health habits early on in life sets children up for healthier teeth, mouths, and bodies as they grow up.

Grade & Trend

Virginia earned a B for this indicator. Over half (59%) of Virginia's children aged 3-20 in Medicaid/FAMIS received a preventive dental service, which is 15% higher than the national benchmark. The most recent data for this analysis is from the state fiscal year 2019. The graph at the right details the children aged 3-20 in Medicaid/FAMIS who received a preventive dental visit in SFY 2016-2019.



2016 Report Card	2022 Report Card	Trend
53% (C)	59% (B)	Cannot be compared*

*These rates cannot be directly compared. The 2016 *Report Card* measured the rates for children aged 1-20, but the 2022 *Report Card* workgroup revised it to 3-20 to remove the overlap with the previous indicator.

Focus on Equity

Adolescents aged 19-20 (24%) had the lowest rates of preventive dental services, followed by those aged 15-18 (52%). Children living in Eastern or Southwest Virginia (54%) and Black/African American children (55%) also reported fewer dental services than other groups.

Opportunities for Improvement

- Integrate medical, behavioral, and oral health care clinics as the standard of care.
- Create incentive programs or rewards for coming to the dentist.
- Promote school-based oral health programs; identify diverse revenue streams to support them.
- Add a dental checkup to the medical clearance or vaccination forms that students must complete for school.
- Improve access to and availability of dental services for children with disabilities.

Pediatric medical providers in Medicaid who apply fluoride varnish

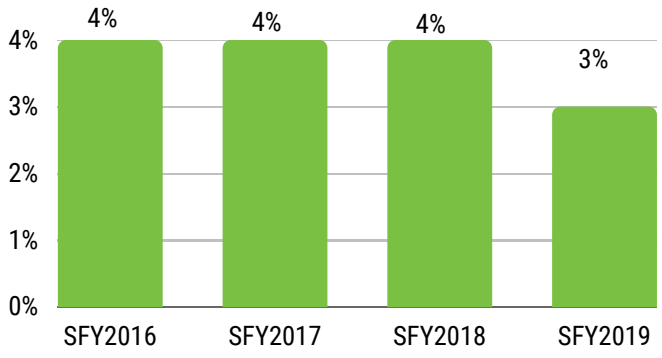
Background

Coordinated efforts between medical and dental providers across disciplines will bolster and accelerate improvements in the health of all Virginians. Routinely asking patients about oral or primary care issues creates awareness of the interconnected relationship between oral health and general health. Patient referrals to address dental or general health concerns will improve the utilization of services and reinforce the connection between oral health and overall health. One practical place to improve medical-dental collaboration is the application of fluoride varnish. The US Preventive Services Taskforce recommends that primary care clinicians apply fluoride varnish to the primary teeth of all infants and children starting as soon as primary teeth come in. Research shows that children who receive at least four fluoride varnish applications before age four have lower rates of tooth decay.

Grade & Trend

In state fiscal year (SFY) 2019, 3% of pediatric medical providers (nurse practitioners and pediatricians) billed Medicaid for fluoride varnish application. No national benchmark exists against which to compare Virginia's performance; therefore, Virginia received an "I" for "incomplete."

The graph at the right details the percentage of medical providers who billed for the application of fluoride varnish in SFY 2016-2019.



2016 Report Card	2022 Report Card	Trend
5% (I)	3% (I)	Cannot be compared*

*These rates cannot be directly compared. The data collection period changed from calendar year in 2016 to state fiscal year in 2022.

Focus on Equity

Children who were of Hispanic ethnicity or Asian were least likely to receive fluoride varnish applications from a medical provider (<1% and 1% respectively).

Opportunities for Improvement

- Integrate medical, behavioral, and oral health care.
- Educate medical providers on reimbursement opportunities using medical billing codes. The reimbursement exceeds the cost of obtaining the varnish. In high-need cases, the Virginia Department of Health could support medical providers obtain fluoride varnish supplies.
- Engage stakeholders (including the Virginia medical associations) in promoting Virginia Department of Health fluoride varnish training programs for medical providers.

Pregnant people who had a dental cleaning

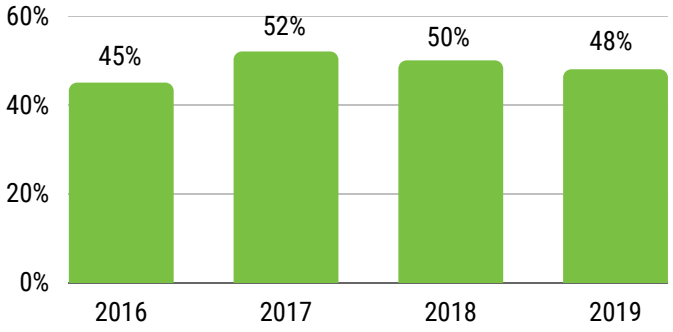
C

Background

Dental care is essential during pregnancy for multiple reasons, including an elevated risk of preterm or low-weight infants among people with periodontal disease. The hormones involved in pregnancy increase the chances of gingivitis, tooth decay, and even tooth loss for the pregnant person. Accordingly, the American Dental Association, the American Congress of Obstetricians and Gynecologists, and the American Academy of Pediatrics all encourage people to see the dentist while pregnant.

Grade & Trend

Virginia earned a C for this indicator. Almost half (48%) of people with live births in calendar year 2019 had at least one dental cleaning during pregnancy; this is 5% higher than the national rate. The graph at the right details the percentage of pregnant people who had their teeth cleaned during pregnancy in Virginia between 2016-2019.



2016 Report Card	2022 Report Card	Trend
44% (D)	48% (C)	Cannot be compared*

*Data reported in the 2016 *Report Card* (from 2010/2011) was based on the number of pregnant people who **visited the dentist**, while the recent survey instrument uses the number of pregnant people who had their **teeth cleaned**. Additionally, the 2016 *Report Card* analyzed data collected before March 2015, when Virginia added a comprehensive Medicaid dental benefit for pregnant enrollees.

Focus on Equity

The following groups had lower rates of dental cleaning during pregnancy:

- Non-White pregnant people: Asian (36%), Hispanic (33%), and Black/African American (41%), compared to White (56%)
- Uninsured or underinsured pregnant people: Medicaid (44%) and uninsured (33%), compared to those with private insurance (55%)
- Pregnant people without a high school diploma (24%) compared to those with a high school education (49%) or college education (52%)
- Pregnant people with incomes under $24,000 (36%) and between $24,000-$48,000 (45%) compared to pregnant people with incomes above $48,000 (60%)

Opportunities for Improvement

- Integrate medical, behavioral, and oral health care during prenatal visits.
- Develop and disseminate educational materials on oral health during pregnancy; Utilize community health workers to provide education on oral health to pregnant people.
- Educate medical providers on the safety and importance of oral health during pregnancy.
- Educate pregnant people with Medicaid on their oral health benefits during and after pregnancy.
- Promote programs that include oral health support for pregnant people (e.g., Virginia Department of Health's dental hygiene work with local Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC) programs).

Adults aged 45-64 with tooth loss

C

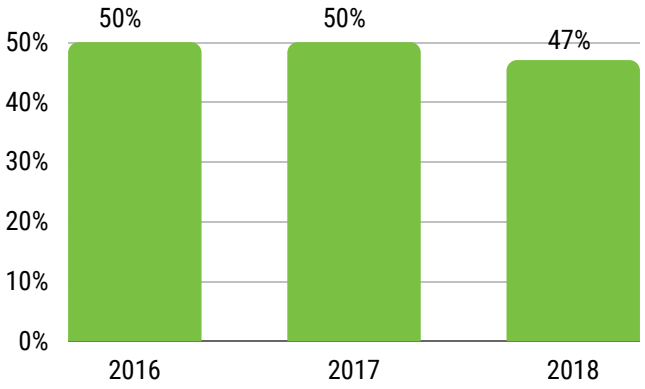
Background

Missing teeth due to dental disease are a widely recognized marker of poor oral health. This measure tends to increase with age and is affected by multiple factors, including access to dental coverage; access to services; nutrition; use of alcohol, drugs, or tobacco; and socioeconomic factors. According to the Centers for Disease Control, extensive tooth loss can lead to poor diet resulting in weight loss or obesity. It can also detract from physical appearance and impede speech, factors that can restrict social contact, inhibit intimacy, and lower self-esteem.

Grade & Trend

Virginia earned a C for this indicator. Almost half (47%) of adults aged 45-64 lost at least one tooth to decay or gum disease; this is 7% lower than the national rate. While Virginia collects this data annually, this item is measured at the national level only in even years; therefore, we analyzed 2018 data for this *Report Card*.

The graph at the right details the percentage of adults age 45-64 with tooth loss due to tooth decay or gum disease in Virginia from 2016-2018.



2016 Report Card	2022 Report Card	Trend
50% (D)	47% (C)	Improvement

Focus on Equity

The following groups of adults had higher rates of tooth loss:

- Uninsured adults (70%) compared to those with health coverage (45%);
- Black/African-Americans (61%) compared to White adults (44%);
- Residents of the Southwestern (61%), Eastern (51%), Northwestern (49%), and Central (49%) parts of Virginia compared to Northern Virginia residents (33%);
- Adults without higher educational attainment (40%) compared to adults with college degrees (23%);
- Adults with incomes <$25,000 (57%) and between $25,000-$50,000 (41%) compared to adults with higher incomes (16%); and
- Adults with a disability (45%) compared to adults without a disability (26%)

Opportunities for Improvement

- Encourage medical providers to conduct oral health screenings at annual check-ups for adults.
- Educate providers and the public about treating dental anxiety among adults.
- Utilize teledentistry to connect medical providers to dental providers as referrals.
- Integrate dental education into nursing/medical curriculum or requirements for accreditation.
- Partner with emergency and urgent care facilities to disseminate oral health education.

Adults aged 18 and older without dental coverage

B

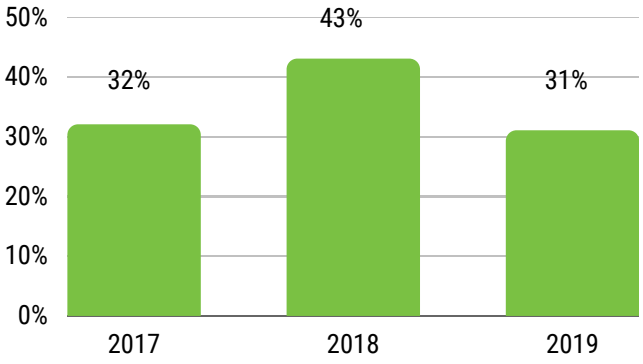
Background

Access to dental insurance coverage is fundamental for sustaining good oral health because individuals without health coverage are more likely to forego or delay care due to concerns about cost. Because dental coverage and medical insurance are typically separate, it is common for adults to have medical coverage but no dental coverage. In 2019, Virginia Medicaid enrollment eligibility was expanded to include individuals ages 19-64 with income at or below 138% of the federal poverty limit. This provided affordable health care coverage, including dental, to hundreds of thousands of Virginians.

Grade & Trend

Virginia earned a B for this indicator. Thirty-one percent of adults over the age of 18 lacked dental coverage in 2019; this is 18% lower than the national rate. In 2021, Virginia's Medicaid program added a comprehensive adult dental benefit. Its impact will not be reflected in the 2022 *Report Card* since 2019 data was the latest available at the time.

The graph at the right details the percentage of adults 18 years and older without dental coverage in Virginia from 2017-2019.



2016 Report Card	2022 Report Card	Trend
38% (D)	31% (C)	Improvement

Focus on Equity

The following groups of adults were more likely to be without dental coverage:

- Adults without health insurance (86%) compared to those with health coverage (25%);
- Black/African American adults (27%) compared to White adults (30%);
- Adult residents of the Southwest (38%) and Northwest (36%) compared to adults in the other parts of the state;
- Adults without a high school education (40%) or adults with a high school education (40%) compared to adults with higher educational attainment (23%);
- Adults with incomes under $25,000 (57%) and incomes between $25,00-$50,000 (41%) compared to those with higher incomes (16%);
- Adults with a disability (45%) compared to adults without a disability (26%).

Opportunities for Improvement

- Provide educational opportunities for communities to learn about coverage options and eligibility.
- Utilize local stakeholder organizations to promote the Medicaid adult dental benefit, including testimonials from those using the dental coverage.
- Incentivize more dentists to participate in the Medicaid program and treat patients of all ages.
- Advocate for more Affordable Care Act marketplace plans to add dental coverage.
- Encourage the Board of Insurance to promote dental in Virginia's new state-run marketplace.

Public water systems with fluoridated water

A

Background

Community water fluoridation (CWF), a practice in place in Virginia since 1951, is the process of adjusting the amount of fluoride in drinking water to a level recommended for preventing tooth decay. The Centers for Disease Control and Prevention label CWF as one of the 10 greatest public health achievements of the twentieth century because of its large contribution to a decline in cavities across the country. According to the American Dental Association, fluoride in community water systems can reduce tooth decay by as much as 25% in children and adults, even in an era with widespread availability of fluoride from other sources, such as fluoride toothpaste. While the return on investment for CWF varies with the size of the community, residents in towns that fluoridate their water save an average of $32 per person by avoiding tooth decay and cavities.

Grade & Trend

Virginia earned an A for this indicator. Almost all (96%) of Virginia's population on public water systems have fluoridated water; this is 32% higher than the national rate. This item is measured only in even years nationally, and 2020 data were not publicly available at the time of this writing; therefore, we are limited in using 2018 data. The rate of Virginia's population served by fluoridated public water systems remained steady from 2016 to 2018.

2016 Report Card	2022 Report Card	Trend
96% (A)	96% (A)	No change.

Focus on Equity

While it is necessary to be vigilant to ensure Virginia retains this grade of fluoridated water, it is important to remember that this data point is not representative of Virginians' access, trust, and water consumption. These data do not include the 22% of Virginians who rely on well water, many of whom live in rural areas. Well water is not regulated for fluoride levels, and these individuals cannot access the oral health benefits of community water fluoridation.

We also know that trust in tap water and, therefore, tap water consumption is declining nationally. Distrust in drinking water is higher among Hispanic (31%) and African American (26%) populations, as well as those with incomes less than $50,000. This results in increased consumption of bottled water, which is largely not fluoridated.

Water Equity In Virginia

Catalyst works with state and local partners to support and maintain proper fluoridation in Virginia's public drinking water. In 2019, we broadened our efforts to ensure equitable access to safe, affordable, and fluoridated drinking water that is trusted and preferred. As a result, the Water Equity Taskforce (WET), the only statewide collective of water advocates working towards a healthier Virginia by advancing drinking water equity, was born.

Opportunities for Improvement

- Utilize co-located or integrated oral, medical, and behavioral health clinics as hubs for water literacy awareness.
- Empower communities to learn more about their drinking water, like where it comes from and if it is fluoridated.
- Encourage the consumption of tap water at meetings, schools, and businesses; remove bottled water options.
- Provide expansive, free, and/or reduced-cost tap water testing and transparent discussion of results.
- Increase the visibility and appreciation of the health and societal benefits of our water infrastructure.

FUTURE CONSIDERATIONS

Workgroup members and other invested partners identified opportunities to improve the *Virginia Oral Health Report Card*, its indicators, and data collection in the future. The next iteration is anticipated for release in 2027.

Many of the indicators focus on data from Virginians covered through Medicaid/FAMIS. However, prevention, coverage, collaboration, and health are important for all. One consideration for the 2027 *Report Card* is to explore the feasibility of using data sources with commercial and uninsured dental claims, such as the Virginia All Pater Claims Database.

Fluoride varnish application is just one example of how collaborative medical and dental care can improve health. Medical and dental professionals have the potential to transform healthcare delivery to make healthcare more comprehensive and improve the total health of Virginians across their lifespans. This work could result in implementing patient-centered, evidence-based, integrated care models, informed by the knowledge and principles of each professional discipline.

Some Virginia-level datasets could include additional measures related to oral health. For example, the Pregnancy Risk Assessment Monitoring System (PRAMS) could ask survey participants about oral health education, barriers to dental care, or other oral health services outside of a teeth cleaning.

Tooth loss tends to increase with age. It could be helpful for the 2027 *Report Card* to explore opportunities to expand the age group analyzed for this indicator from 45-64 to 45-80 potentially.

In addition to the data sources used for the public water fluoridation indicator, there are different metrics used to evaluate fluoride in drinking water and populations that benefit from it. Catalyst staff will work with partners in Virginia and at the national level to determine if the metric used in this report is the best representation of access to fluoridated drinking water or if there is a superior metric. The result of this work will be reflected in the 2027 *Report Card*.

Appendix A: Indicators by Year and Demographics

Table 1. Children aged 1-2 enrolled in Medicaid/FAMIS that received a preventive dental service, SFY 2016-2019				
	SFY2016	**SFY2017**	**SFY2018**	**SFY2019**
Counts (#)				
Total Number of children aged 1-2 enrolled in Medicaid/FAMIS that received a preventive dental service (#)	23,357	25,193	25,456	25,520
By Race/Ethnicity (#)				
Asian	983	1,061	1,160	1,217
Black/African American	9,053	9,519	9,234	9,145
White	11,835	13,182	13,680	13,730
Other	108	100	113	105
Hispanic Ethnicity	159	68	50	61
Unknown	296	243	322	455
By Region (#)				
Central	5,724	5,786	5,680	5,649
Eastern	5,349	5,695	5,824	5,909
Northern	5,422	6,281	6,658	6,797
Northwest	3,525	3,736	3,683	3,759
Southwest	2,411	2,660	2,694	2,598
Rate (%)				
Children aged 1-2 enrolled in Medicaid/FAMIS that received a preventive dental service as a Percent of children enrolled in Medicaid/FAMIS aged 1-2 with 90-day continuous enrollment (%)	25%	27%	28%	27%
By Race/Ethnicity (%)				
Asian	24%	26%	27%	28%
Black/African American	29%	31%	30%	30%
White	23%	26%	26%	27%
Other	27%	25%	31%	30%
Hispanic Ethnicity	38%	39%	28%	28%
Unknown	21%	21%	23%	22%
By Region (%)				
Central	33%	34%	33%	32%
Eastern	26%	28%	28%	29%
Northern	27%	30%	32%	32%
Northwest	25%	27%	27%	27%
Southwest	15%	17%	17%	16%
Source: DentaQuest/Department of Medical Assistance Services (SFY2016-SFY2019)				

Table 2. Children aged 3-20 enrolled in Medicaid/FAMIS that received a preventive dental service, SFY2016-2019				
	SFY2016	**SFY2017**	**SFY2018**	**SFY2019**
Counts (#)				
Total Number of children aged 3-20 enrolled in Medicaid/FAMIS that received a preventive dental service (#)	384,114	393,847	397,981	408,798
By Age Group (#)				
Age 3-5	75,749	76,763	76,899	77,960
Age 6-9	118,789	118,475	115,734	115,410
Age 10-14	117,158	123,666	128,305	133,490
Age 15-18	64,640	67,233	68,942	71,192
Age 19-20	7,778	7,710	8,101	10,746
By Race/Ethnicity (#)				
Asian	21,455	22,390	22,861	24,403
Black/African American	133,163	137,249	138,105	139,444
White	205,177	211,375	215,704	224,183
Other	1,698	1,728	1,744	1,802
Hispanic Ethnicity	7,336	6,298	5,883	5,518
Unknown	4,247	3,802	3,634	4,559
By Region (#)				
Central	72,932	74,784	75,092	77,104
Eastern	83,132	84,849	85,377	87,792
Northern	90,591	92,373	95,216	100,716
Northwest	58,789	59,842	60,675	62,411
Southwest	67,383	70,271	70,894	71,204
Rate (%)				
Children aged 3-20 enrolled in Medicaid/FAMIS that received a preventive dental service as a Percent of children enrolled in Medicaid/FAMIS aged 1-2 with 90-day continuous enrollment (%)	59%	61%	61%	59%
By Age Group (%)				
Age 3-5	58%	60%	60%	59%
Age 6-9	67%	69%	69%	68%
Age 10-14	62%	65%	65%	64%
Age 15-18	51%	53%	53%	52%
Age 19-20	28%	28%	28%	24%
By Race/Ethnicity (%)				
Asian	68%	70%	70%	68%
Black/African American	55%	58%	57%	55%
White	61%	63%	63%	61%
Other	59%	58%	58%	55%
Hispanic Ethnicity	76%	82%	86%	85%
Unknown	53%	56%	58%	45%
By Region (%)				
Central	58%	61%	60%	58%
Eastern	55%	57%	57%	54%

Table 2. Children aged 3-20 enrolled in Medicaid/FAMIS that received a preventive dental service, SFY2016-2019				
	SFY2016	**SFY2017**	**SFY2018**	**SFY2019**
Northern	69%	71%	72%	70%
Northwest	60%	62%	62%	59%
Southwest	55%	57%	57%	54%
Source: DentaQuest via the Department of Medical Assistance Services (SFY16-SFY2019)				

Table 3. Pediatric Medical Providers Applying Fluoride Varnish in Medicaid, SFY 2016-2019				
	SFY2016	**SFY2017**	**SFY2018**	**SFY2019**
Counts (#)				
Total Number of Pediatric Medical Providers (#)	6,825	9,046	10,182	10,924
Pediatric Medical Providers with a Fluoride Varnish Claim (#)	244	330	413	364
Enrollee's Age (#)				
Under Age 1	192	246	273	186
Age 1	236	315	385	331
Age 2	203	278	328	250
Enrollee's Race/Ethnicity (#)				
Asian	112	135	159	86
Black/African American	199	267	321	259
White	235	312	385	306
Other	108	127	162	87
Hispanic Ethnicity	18	26	24	3
Enrollee's Region (#)				
Central	77	124	129	75
Eastern	108	129	145	116
Northern	73	98	139	120
Northwest	90	135	157	122
Southwest	77	99	100	60
Rate (%)				
Pediatric Medical Providers with a Fluoride Varnish Claim as a Percent of Pediatric Providers (%)	3.60%	3.60%	4.10%	3.30%
Enrollee's Age (%)				
Under Age 1	2.80%	2.70%	2.70%	1.70%
Age 1	3.50%	3.50%	3.80%	3.00%
Age 2	3.00%	3.10%	3.20%	2.30%
Enrollee's Race/Ethnicity (%)				
Asian	1.60%	1.50%	1.60%	0.80%
Black/African American	2.90%	3.00%	3.20%	2.40%
White	3.40%	3.40%	3.80%	2.80%
Other	1.60%	1.40%	1.60%	0.80%
Hispanic Ethnicity	0.30%	0.30%	0.20%	0.00%
Enrollee's Region (%)				
Central	1.10%	1.40%	1.30%	0.70%
Eastern	1.60%	1.40%	1.40%	1.10%
Northern	1.10%	1.10%	1.40%	1.10%
Northwest	1.30%	1.50%	1.50%	1.10%
Southwest	1.10%	1.10%	1.00%	0.50%
Source: Department of Medical Assistance Services (SFY16-SFY2019)				

Table 4. Pregnant People who had their teeth cleaned during pregnancy, 2016-2019				
	2016	**2017**	**2018**	**2019**
Weighted Counts (#)				
Total number of pregnant people who had their teeth cleaned by a dentist or dental hygienist during their most recent pregnancy (#)	42,882	49,010	46,558	43,840
By Insurance Status (#)				
Medicaid	3,888	3,130	3,843	5,933
Private Insurance	33,413	39,885	37,612	33,065
Uninsured	3,787	5,061	3,856	4,410
Other[1]	1,548	628	1,018	83
Unknown[2]	N/A	N/A	N/A	N/A
By Race/Ethnicity (#)				
Non-Hispanic Asian/Pacific Islander	2,545	2,296	2,918	2,719
Non-Hispanic Black/African American	7,334	7,783	7,202	7,366
Non-Hispanic White	26,413	31,450	30,888	27,420
Hispanic Ethnicity	4,742	6,523	4,693	4,458
Other	1,848	949	536	1,496
By Available Health Districts[3] (#)				
Blue Ridge	--	1,435	1,279	1,421
Richmond City	--	1,317	1,550	1,505
By Residency (#)				
Urban	39,990	45,611	43,453	39,364
Rural	2,893	3,399	3,105	4,476
By High School (HS) Education (#)				
<HS	2,311	4,099	2,483	2,278
HS	8,700	7,245	13,096	12.639
>HS	31,871	37,666	30,980	28,923
By Income (#)				
<$24,000	8,221	6,861	7,123	8,859
$24,000-48,000	6,856	6,975	7,613	7,537
>$48,000	26,086	32,185	28,869	24,654
Rate (%) (CI)				
Total number of pregnant people who had their teeth cleaned by a dentist or dental hygienist during their most recent pregnancy as a percent of total pregnant people surveyed with live births (%)	44.7% (39.9-49.6)	52.2% (47.4-57.1)	49.9% (45.0-54.8)	48.4% (43.3-53.4)
By Insurance Status (%)*				
Medicaid	37.3% (22.0-52.5)	29.5% (16.1-42.9)	32.6% (18.5-46.7)	43.5% (29.5-57.4)
Private Insurance	53.4% (47.4-59.3)	61.8% (56.1- 67.5)	57.2% (51.5-62.8)	55.4% (49.4-61.5)
Uninsured	22.1% (12.1, 31.9)	35.1% (23.2, 47.1)	31.9% (19.6, 44.0)	32.9% (20.1, 45.6)
Other[1]	42.9% (18.3-67.4)	28.6% (0.0-58.0)	40.8% (9.2-72.4)	4.9% (0.4-9.5)
Unknown[2]	0.6 % N/A	0.1% N/A	0.7% N/A	0.6% N/A

Table 4. Pregnant People who had their teeth cleaned during pregnancy, 2016-2019				
	2016	**2017**	**2018**	**2019**
By Race/Ethnicity (%)*				
Non-Hispanic Asian/Pacific Islander	38.6% (21.7-55.5)	42.1% (22.8-61.5)	37.8% (22.2-53.4)	36.2% (19.7-52.6)
Non-Hispanic Black/African American	35.3% (24.3-46.3)	47.6% (35.6-59.7)	41.0% (29.6-52.4)	40.6% (29.5, 51.8)
Non-Hispanic White	52.8% (46.2-59.3)	58.4% (52.0-64.4)	58.0% (51.6-64.3)	56.6% (49.9-63.4)
Hispanic Ethnicity	32.9% (21.4-44.5)	40.4% (28.7-52.1)	37.9% (25.0-50.7)	33.2% (20.4-46.0)
Other	49.1% (25.3-72.8)	48.3% (15.6-81.0)	27.1% (0.00-55.6)	55.1% (25.7-84.5)
By Available Health Districts (%)				
Blue Ridge	--	55.4% (50.3- 60.5)	49.9% (44.7-55.3)	55.9% (50.2-61.6)
Richmond City	--	45.0% (39.8- 50.2)	49.7% (44.7-54.6)	50.1% (44.9-55.2)
By Residency (%)				
Urban	46.1% (41.0- 51.2)	53.2% (48.1- 58.3)	50.2% (45.2-55.2)	48% (42.7-53.2)
Rural	31.8% (17.2- 46.3)	41.9% (25.5- 58.3)	45.9% (27.2-64.5)	52.4% (35.0-69.9)
By High School (HS) Education (%)*				
<HS	23.3% (10.5-36.2)	32.8% (19.9- 45.6)	32.7% (16.1-49.3)	24% (9.8- 38.3)
HS	35.5% (26.0- 44.9)	33% (23.3- 42.7)	46.6% (36.9-56.3)	49% (38.7-59.4)
>HS	51.9% (45.9- 57.9)	63.5% (57.6- 69.3)	53.8% (47.9-59.6)	52.3% (46.2-58.3)
By Income (%)*				
<$24,000	27.8% (19.6- 36.0)	29.8% (20.6- 39.1)	34.9% (24.5-45.3)	35.9% (25.9-45.8)
$24,000-$48,000	41.9% (30.1- 53.8)	47.2% (34.5- 59.8)	48% (35.9-60.1)	44.6% (32.6-56.5)
>$48,000	59.6% (52.8- 66.5)	68.1% (61.8- 74.4)	61.6% (55.3-68.0)	59.6% (52.5-66.6)
N/A- Due to the nature of the survey, the only available data for "unknown" is the weighted percent (i.e., weighted percent of survey participants who did not respond to the question).				
Health District Availability-VA PRAMS is a state-based survey; however, the program began oversampling BRHD and RCHD in 2017; therefore, data is only available for those localities beginning in 2017.				
-- Counts under ten are suppressed				
* Denotes a statistically significant difference				
Source: Virginia Department of Health, Office of Family Health Services, Pregnancy Risk Assessment Monitoring System (PRAMS), 2016-2019.				

Table 5. Adults aged 45-64 with tooth loss due to tooth decay or gum disease, 2016-2019				
	2016	**2017**	**2018**	**2019**
Weighted Counts (#)				
Total Number of adults aged 45-64 who have lost at least one tooth because of decay or gum disease (#)	1,101,022	929,871	1,029,371	872,945
By Number of Teeth Extracted (#)				
1 to 5	709,903	615,328	689,182	582,437
Six or more (including all)	391,119	314,542	340,189	290,508
By Race/Ethnicity (#)				
Asian	--	--	--	--
Black/African American	290,048	240,999	243,149	197,639
White	650,772	580,228	634,869	533,042
Other	--	--	--	--
Unknown Race	--	--	--	--
Hispanic Ethnicity	--	--	--	--
By Healthcare Insurance Coverage (#)				
Yes	962,279	832,640	882,229	770,449
No	130,862	95,676	146,274	101,523
By Region (#)				
Central	207,575	176,627	189,482	157,047
Eastern	256,911	212,096	231,558	199,108
Northern	243,159	211,681	218,406	205,188
Northwestern	170,764	145,283	172,617	123,733
Southwest	222,613	184,184	217,308	187,868
By High School (HS) Education (#)				
<HS	137,353	--	166,235	--
HS	270,671	342,540	314,549	266,232
>HS	520,598	562,182	543,296	459,398
By Income (#)				
<$25,000	288,490	221,596	258,797	199,981
$25,000-50,000	203,458	163,887	203,125	152,814
>$50,000	443,801	430,976	428,968	390,887
By Disability Status				
Yes	369,424	338,281	349,575	326,160
No	682,067	586,619	645,040	540,452
By Sexual Orientation	**Aggregate Counts (2016 to 2020)**			
Heterosexual (Cisgender)	1,145,910			
Lesbian, Gay, or Bisexual	30,290			
Transgender	--			

Table 5. Adults aged 45-64 with tooth loss due to tooth decay or gum disease, 2016-2019				
	2016	**2017**	**2018**	**2019**
Rate (%) (CI)				
Total Number of adults aged 45-64 who have lost at least one tooth because of decay or gum disease (%)	49.9% (47.7-52.1)	49.6% (47.3-51.9)	46.8% (44.7-48.9)	49% (46.6-51.4)
By Number of Teeth				
1 to 5	- -	75.3% (66.8-83.9)	- -	- -
Six or more (including all)	62.6% (58.5-66.7)	62.4% (57.7-67.1)	62.5% (58.2-66.8)	65.5% (60.5-70.5)
By Race/Ethnicity (%)				
Asian	--	--	--	--
Black/African American	67.1% (62.0-72.1)	64.1% (58.5-69.8)	61.4% (56.0-66.8)	60.3% (54.3-66.3)
White	44.3% (41.9-46.6)	45.8% (43.3-48.3)	43.6% (41.4-45.9)	44.3% (41.7-46.8)
Other	--	--	--	--
Unknown Race	--	--	--	--
Hispanic Ethnicity	--	--	--	--
By Healthcare Insurance				
Yes	48.1% (45.9-50.4)	48.2% (45.8-40.7)	44.6% (42.4-46.8)	47.3% (44.8-50.0)
No	66.1% (58.7-73.6)	66.6% (59.3-74.0)	70.0% (63.4-76.4)	68.2% (59.3-77.1)
By Region (%)				
Central	54.0% (49.6-58.4)	54.5% (49.2-59.9)	49.1% (44.1-54.1)	50.9% (45.1-56.7)
Eastern	55.4% (51.1-59.8)	54.1% (49.4-58.8)	51.3% (47.4-55.2)	54% (49.5-58.5)
Northern	37.7% (32.3-43.0)	38.4% (33.1-43.6)	33.1% (28.8-37.3)	39.4% (34.1-44.6)
Northwestern	48.8% (44.2-53.5)	48.2% (42.9-53.5)	49.9% (44.7-55.0)	43.3% (37.8-48.8)
Southwest	61.4% (57.6-65.2)	60.3% (55.9-64.8)	61.1% (56.9-65.3)	63.4% (58.6-68.1)
By High School (HS)				
<HS	- -	75.3% (66.8-83.9)	- -	- -
HS	62.6% (58.5-66.7)	62.4% (57.7-67.1)	62.5% (58.2-66.8)	65.5% (60.5-70.5)
>HS	40.3% (37.6-43.0)	41.5% (38.7-44.3)	37.3% (34.9-39.7)	38.5% (36.0-41.1)

Table 5. Adults aged 45-64 with tooth loss due to tooth decay or gum disease, 2016-2019				
	2016	**2017**	**2018**	**2019**
By Income (%)				
<$25,000	73.8% (69.2-78.4)	75.4% (70.3- 80.4)	77.0% (72.5- 81.5)	77.4% (72.1-82.7)
$25,000-50,000	61.3% (56.0-66.6)	60.7% (54.7-66.6)	62.6% (57.1-68.2)	60.6% (54.5-66.8)
>$50,000	37. 2% (34.3-40.2)	39.8% (36.7-42.9)	35.3% (32.6-37.9)	37.6% (34.5-40.8)
By Disability Status (%)				
Yes	68.5% (64.6-72.5)	69.8% (65.6-74.1)	67.2% (63.1 - 71.3)	68.3% (64.2 - 72.4)
No	42.7% (40.1-45.3)	42.5% (39.8-45.2)	40.4% (38.0-42.8)	41.9% (39.1-44.7)
By Sexual Orientation (%)	**Aggregate Rates (2016 to 2020)**			
Heterosexual (Cisgender)	47.7% (46.5 - 48.9)			
Lesbian, Gay, or Bisexual	47.3% (40.0 - 54.7)			
Transgender	47.7% (46.5 - 48.9)			
Counts and rates are weighted to population characteristics.				
* Denotes a statistically significant difference				
-- replaces estimates when the unweighted sample size for the denominator was <20 or the CI half-width was >10 for any cell.				
Source: Source: Virginia Behavioral Risk Factor Surveillance System, 2016-2019 (aggregate counts by sexual orientation 2016-2020)				

Table 6. Adults aged 18 and older without dental insurance coverage, 2017-2019				
	2016	**2017**	**2018**	**2019**
Weighted Counts (#)				
Total Number of adults age 18+ with dental coverage (#)	N/A	1,688,045	1,859,391	1,560,010
By Healthcare Insurance Coverage				
Yes	N/A	1,221,912	1,644,244	1,101,545
No	N/A	458,380	203,408	452,905
By Race/Ethnicity (#)				
Asian	N/A	64,670	- -	- -
Black/African American	N/A	322,542	346,205	227,487
White	N/A	1,055,332	1,187,092	984,730
Other	N/A	- -	- -	- -
Unknown Race	N/A	- -	- -	- -
Hispanic Ethnicity	N/A	- -	- -	- -
By Region (#)				
Central	N/A	278,233	327,831	267,421
Eastern	N/A	368,588	406,783	304,694
Northern	N/A	352,142	475,723	357,849
Northwestern	N/A	319,250	331,239	303,690
Southwest	N/A	369,833	317,816	326,356
By High School (HS) Education (#)				
<HS	N/A	369,860	224,506	311,727
HS	N/A	546,522	473,075	487,715
>HS	N/A	769,155	1,159,195	755,312
By Income (#)				
<$25,000	N/A	632,494	341,264	494,968
$25,000-50,000	N/A	372,672	351,049	529,435
>$50,000	N/A	384,168	910,071	413,415
By Disability Status (#)				
Yes	N/A	669,234	485,424	708,478
No	N/A	1,002,673	1,360,543	2,723,117
By Sexual Orientation (#)	**Aggregate Counts (2016 to 2020)**			
Heterosexual (Cisgender)	4,127,624			
Lesbian, Gay, or Bisexual	182,909			
Transgender	- -			
Counts and rates are weighted to population characteristics.				
* Denotes a statistically significant difference				
-- replaces estimates when the unweighted sample size for the denominator was <20 or the CI half-width was >10 for any cell.				
Source: Source: Virginia Behavioral Risk Factor Surveillance System, 2016-2019 (aggregate counts by sexual orientation 2016-2020)				

Table 6. Adults aged 18 and older without dental insurance coverage, 2017-2019				
	2016	2017	2018	2019
Rate (%) (CI)				
Total Number of adults age 18+ without dental coverage (%)	N/A	31.9% (30.5-33.4)	42.6% 40.9-44.2)	31.1% (29.6-32.5)
By Healthcare Insurance Coverage				
Yes	N/A	25.7% (24.4-27.1)	58.0% (56.3-59.7)	24.6% (23.3-25.9)
No	N/A	86.9% (82.3-91.5)	53.4% (47.3-59.3)	86.3% (82.2-90.4)
By Race/Ethnicity (%)				
Asian	N/A	19.4% (12.0-26.9)	- -	- -
Black/African American	N/A	33.5% (29.8-37.2)	48.7% (44.2-53.2)	26.7% (23.3-30.1)
White	N/A	31.4% (29.8-33.0)	40.8% (38.9-42.6)	30.1% (28.5-31.7)
Other	N/A	- -	- -	- -
Unknown Race	N/A	- -	- -	- -
Hispanic Ethnicity	N/A	- -	- -	- -
By Region (%)				
Central	N/A	29.2% (25.7-32.7)	43.8% (39.7-47.9)	29.9% (26.4-33.4)
Eastern	N/A	31.2% (28.3-34.2)	43.8% (40.6-47.1)	28.0% (25.4-30.7)
Northern	N/A	24.3% (21.3-27.2)	40.1% (36.5-43.7)	26.7% (23.5-30.0)
Northwestern	N/A	37.3% (33.7-40.9)	43.5% (39.7-47.4)	36.2% (32.6-9.7)
Southwest	N/A	43.7% (40.4-47.1)	42.8% (39.4-46.2)	37.9% (34.9-41.0)
By High School (HS) Education (%)				
<HS	N/A	61.8% (55.8-67.8)	48.2% (41.8-54.6)	39.9% (34.2-45.5)
HS	N/A	40.7% (37.6-43.8)	45.3% (41.8-48.7)	40.1% (36.8-43.4)
>HS	N/A	23.1% (21.6-24.6)	40.7% (38.8-42.7)	23.1% (21.6-24.5)
By Income (%)				
<$25,000	N/A	67.6% (64.0-71.2)	50.6% (46.5-54.7)	57.4% (53.7-61.1)
$25,000-50,000	N/A	38.3% (34.7-42.0)	46.8% (42.7-50.9)	40.5% (36.9-44.1)

Table 6. Adults aged 18 and older without dental insurance coverage, 2017-2019				
	2016	**2017**	**2018**	**2019**
>$50,000	N/A	14.7% (13.3-16.1)	39.0% (36.8-41.2)	16.4% (14.6-18.1)
By Disability Status (%)				
Yes	N/A	50.9% (47.8-53.9)	49.3% (45.9-52.6)	45.1% (42.3-47.9)
No	N/A	25.5% (23.9-27.1)	40.6% (38.7-42.5)	26.2% (24.6-27.9)
By Sexual Orientation (%)	**Aggregate Rate (2017 to 2020)**			
Heterosexual (Cisgender)	N/A (aggregate rates were insufficient for this analysis)			
Lesbian, Gay, or Bisexual	N/A (aggregate rates were insufficient for this analysis)			
Transgender				
Counts and rates are weighted to population characteristics.				
* Denotes a statistically significant difference				
-- replaces estimates when the unweighted sample size for the denominator was <20 or the CI half-width was >10 for any cell.				
Source: Source: Virginia Behavioral Risk Factor Surveillance System, 2016-2019 (aggregate counts by sexual orientation 2016-2020)				

Appendix B: Technical Notes

Methodology

In 2016, Catalyst compiled a list of potential indicators pooled from various state-level data sources to facilitate the selection of indicators in various domains of oral health across the lifespan. Catalyst then grouped the indicators into categories based on the 2015 Virginia Oral Health Plan. Workgroup members and other external stakeholders provided input to pare down this list of dozens of potential measures throughout the summer of 2016, and to select appropriate benchmarks for comparison to grade Virginia's performance. The main criteria used to determine measures in the 2016 *Report Card* are listed in Table 1 below.

Table 1: Selection Criteria for *Report Card* Indicators

Relevance	Data Characteristics
• Will the indicator increase awareness of the importance of oral health (i.e., how "compelling" and "impactful" is this indicator)? • Is the indicator meaningful for advocacy and education efforts? • Is the indicator useful to inform strategic planning for specific areas of oral health quality improvement? • Is the indicator tracked at the national level as well as the state level?	• Is the indicator sensitive to change over time? • Are current and historical data available to provide trend information? • Do national data exist for this indicator to provide a benchmark for comparison? • Does the state agency collecting data on this indicator plan to continue data collection? • Can the data be aggregated by sub-state geographic unit (e.g., Health Planning Region, Health Planning District, county or city, or zip code)? • Can the data be stratified to examine differences by demographic characteristics such as age, race/ethnicity, income, or education?

Each of the *Report Card* measures met most of the criteria described above. Part of the objective of the *Report Card* effort is to highlight specific topic areas or populations that require monitoring (or more robust, timely monitoring) through data collection and analysis. In addition, Catalyst plans for the *Report Card* to be a "living document" that will continually evolve, adding new data sources and measures where appropriate to provide a more detailed snapshot of the status of oral health in Virginia.

Grading

In 2016, Catalyst and the work group considered several potential methodologies for grading Virginia's performance on the *Report Card* indicators. It was clear to all partners involved in this project that Virginia has made substantial progress over time. As such, one option that the group considered was to grade Virginia based on the trend over time for each indicator, giving points for improvement and deducting points for stagnated or worse performance. In light of Virginia's vision to become the healthiest state in the nation, the grading methodology presented below provides grades for Virginia compared to national benchmarks.

It is important to note that this grading methodology, although robust, is subjective. Furthermore, the grade does not reflect the performance of any particular agency or agencies. The primary objectives behind assigning grades are to raise awareness about oral health issues, and to continue forward momentum on various promising opportunities to improve oral health outcomes and care delivery.

Selection of National Benchmarks

The national benchmarks for each of the nine *Report Card* indicators are based on the most recent available estimates from national surveys, and Medicaid claims data. Despite the attempt to use national benchmarks that closely mirror the *Report Card* measures, direct comparisons between indicators pulled from Virginia-specific data sources and national data sources are limited for some indicators. Possible issues include differences in the methodologies used to collect and analyze the data; the size and demographic characteristics of the sample populations; and the data collection timeframe. In addition, it should be noted that no differences between state and national estimates were tested for statistical significance. All interpretations of the findings presented in the *Report Card* must account for these limitations.

Grade Description

The *Report Card* grade is determined using a two-step process. The first step is to assign a score for each indicator based on how Virginia performs compared to a national benchmark. Letter grades are awarded for each indicator depending on how far above or below Virginia's percentage is relative to the national benchmark. The letter grades have specific point values, as described in *Table 2* below.

The second step is to calculate the overall grade for Virginia by averaging the points for all nine indicators. The measure of Medicaid pediatric medical providers applying fluoride varnish is incomplete because it does not have a national benchmark for comparison; however, it is highlighted in the *Report Card* to track Virginia's future progress. *Table 3* on the next page presents the detailed grading rubric, including: desired trend; current Virginia and national percentages; the percent difference between Virginia and national percentages; the number of points awarded; and the grade. **Using this scale, Virginia receives an overall score of C+ because the average of all the indicators' scores equals 2.4 points.**

Table 2: Grade Calculation, Criteria, and Scale

Calculation

Calculation: The following formula is used to calculate the relative difference between Virginia's percentages and national percentages:

$$\frac{\text{(Current Virginia percentage - National percentage)}}{\text{National percentage}} \times 100 = \text{Percent difference of Virginia rate from national rate}$$

Criteria

Grade	Points	Criteria
A	4	≥20% better than national
B	3	10 to 20% better than national
C	2	0 to 10% change from national
D	1	10 to 20% worse than national
F	0	≥20% worse than national
I	--	Incomplete; not graded, will monitor progress going forward.

Scale

Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	F
4.0 Scale	4.0	4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.9	1.7	1.3	0.0

Table 3: Detailed *Report Card* Rubric and Scale

Indicator	Desired Trend	VA %	US %	% Difference	Points	Grade
Children aged 1-2 who had a preventive dental visit through Medicaid	↑	27.0%	26.5%	2.1%	2	C
Children aged 3-20 who had a preventive dental visit through Medicaid	↑	59.0%	51.3%	14.9%	3	B
Third-graders who have experienced tooth decay	↓	--	--	--	--	--
Third-graders who have dental sealants on permanent molars	↑	--	--	--	--	--
Medicaid pediatric medical providers applying fluoride varnish	↑	3.3%	--	--	--	I
Pregnant people who had their teeth cleaned during pregnancy	↑	48.4%	45.9%	5.4%	2	C
Adults aged 45-64 who have lost at least one tooth because of tooth decay or gum disease	↓	46.8%	50.3%	7.0%	2	C
Population served by fluoridated public water systems	→	96.3%	73.0%	31.9%	4	A
Adults aged 18 and older who do not have dental coverage	↓	31.1%	38.0%	18.2%	3	B
				AVERAGE	**2.4**	**C+**

-- Data are not available

Children aged 1-2 enrolled in Medicaid/FAMIS that received a preventive dental service	
Numerator	The number of children enrolled in Medicaid/FAMIS aged 1-2 who received preventive dental services.
Denominator	Total children enrolled in Medicaid/FAMIS aged 1-2 with 90-day continuous enrollment.
Limitations	The federal fiscal year timeframe for the national data is 10/1/2018 to 9/30/2019, different from Virginia's data which is from the state fiscal year (SFY) timeframe of 7/1/2018 to 6/30/2019. While many of Virginia's most vulnerable children and teens are enrolled in Medicaid, preventive oral health services are necessary for all children. This measure is specific to children enrolled in Medicaid, partly because of data limitations. Adequate statewide data which measures the utilization of preventive dental services for all children needs further development.
Virginia Data Source	Virginia Department of Medical Assistance Services, Virginia Smiles for Children– State Fiscal Year 2016-2019 Pediatric Dental Participation Report. Virginia Department of Medical Assistance Services (DMAS) and DentaQuest, the contracted dental benefits administrator for Virginia's Medicaid and FAMIS programs, routinely collect and report claims data on preventive dental services rendered to children enrolled in Medicaid or FAMIS in compliance with the federal Annual Early, Periodic Screening, Diagnosis, and Treatment (EPSDT) guidelines. The Smiles for Children program provides a comprehensive dental benefit for children under age 21, including diagnostic, preventive, periodontal, restorative/surgical procedures, and orthodontics. Children younger than one were excluded from the Report Card indicators because some children do not get their first teeth until six months to 1 year, skewing the utilization rate.
National Benchmark Data Source	Centers for Medicare and Medicaid Services, Annual Early, Periodic Screening, Diagnosis, and Treatment (EPSDT) Participation Report – Form CMS 416 (National), Fiscal Year 2019.

Children aged 3-20 enrolled in Medicaid/FAMIS that received a preventive dental service	
Numerator	The number of children enrolled in Medicaid/FAMIS aged 3-20 who received preventive dental services.
Denominator	Total children enrolled in Medicaid/FAMIS aged 3-20 with 90-day continuous enrollment.
Limitations	The federal fiscal year timeframe for the national data is 10/1/2018 to 9/30/2019, different from Virginia's data which is from the state fiscal year (SFY) timeframe of 7/1/2018 to 6/30/2019. While many of Virginia's most vulnerable children and teens are enrolled in Medicaid, preventive oral health services are necessary for all children. This measure is specific to children enrolled in Medicaid, partly because of data limitations. Adequate statewide data which measures the utilization of preventive dental services for all children needs further development. The *2022 Report Card* rate cannot be compared to the rate in the 2016 Report Card. The 2016 report card included the 1-20 age group; in 2022, the OHRC workgroup revised the age group to aged 3-20, to remove overlap with the 1-2 aged group preventive visit measure.
Virginia Data Source	Virginia Department of Medical Assistance Services, Virginia Smiles for Children– State Fiscal Year 2016-2019 Pediatric Dental Participation Report. Virginia Department of Medical Assistance Services (DMAS) and DentaQuest, the contracted dental benefits administrator for Virginia's Medicaid and FAMIS programs, routinely collect and report claims data on preventive dental services rendered to children enrolled in Medicaid or FAMIS in compliance with the federal Annual Early, Periodic Screening, Diagnosis, and Treatment (EPSDT) guidelines. The Smiles for Children program provides a comprehensive dental benefit for children under age 21, including diagnostic, preventive, periodontal, restorative/surgical procedures, and orthodontics.
National Benchmark Data Source	Centers for Medicare and Medicaid Services, Annual Early, Periodic Screening, Diagnosis, and Treatment (EPSDT) Participation Report – Form CMS 416 (National), Fiscal Year 2019.

Pediatric Medical Providers Applying Fluoride Varnish in Medicaid	
Definition	Fluoride varnish is a highly concentrated fluoride lacquer that a medical or dental professional applies to tooth surfaces to prevent decay. It can be applied to primary and permanent teeth.
Numerator	The number of Medicaid pediatricians and pediatric nurse practitioners billing for fluoride varnish application on patients ages 1-2 from SFY2016-SFY2019.
Denominator	The total number of Medicaid pediatricians and pediatric nurse practitioners eligible to bill for fluoride varnish application on patients ages 1-2 from SFY2016-SFY2019. In Virginia, certain medical providers can be reimbursed through Medicaid and private insurance for the application of fluoride varnish on young children.
Limitations	In 2016, the workgroup agreed to "grade" the Virginia rate based on changes from report card to report card. In this second iteration of the Report Card, the SFY2019 rate was 3% vs. the 2016 rate of 5%. However, due to a change in the data collection period (state fiscal year, not calendar year), a review of these two rates is instructive, but cannot be directly compared.
Virginia Data Source	Department of Medical Assistance Service (SFY16-SFY2019). In addition to utilization data, DMAS also supplied data on claims for the application of fluoride varnish for patients ages 1 to 2. This information was used to calculate the proportion of eligible pediatric medical providers that billed Medicaid for fluoride varnish applications from SFY16-SFY2020.
National Benchmark Data Source	None

Pregnant people who had their teeth cleaned during pregnancy	
Numerator	The number of women who reported having their teeth cleaned by a dentist or dental hygienist during pregnancy.
Denominator	The total number of surveyed women with live births.
Limitations	It is important to note that the data reported in the 2016 report card (2010/2011 data) is based on the number of pregnant people who visited the dentist. In contrast, the recent survey instrument has been revised to obtain the rate of pregnant people who had their teeth cleaned during a dental visit. Additionally, the 2016 report card is based on data collected before March 2015, when Virginia added a comprehensive Medicaid dental benefit for pregnant enrollees.
Virginia Data Source	Virginia Department of Health, Office of Family Health Services, Pregnancy Risk Assessment Monitoring System (PRAMS), 2016-2019. The Virginia Pregnancy Risk Assessment Monitoring System (PRAMS) is an annual survey of approximately 1,200 mothers who have recently had a baby, chosen at random from Virginia birth certificates. PRAMS is a CDC-developed national survey of women with live births. The survey is conducted in 47 states and represents approximately 83% of births in the U.S.
National Benchmark Data Source	Centers for Disease Control, National Center for Chronic Disease Prevention and Health Promotion, Prevalence of Selected Maternal and Child Indicators for All PRAMS Sites; 2016-2019

Adults Aged 45-64 With Tooth Loss	
Definition	This indicator only counts teeth removed due to tooth decay or gum disease, including teeth lost to infection, but not including teeth lost for other reasons, such as injury or orthodontics. Wisdom teeth removed due to decay or disease are also included in the count.
Numerator	The number of surveyed adults ages 45-64 reporting at least one permanent tooth loss due to tooth decay or gum disease.
Denominator	The total number of surveyed adults ages 45-64.
Limitations	While Virginia collects data for this indicator annually, this item is measured only in even years nationally; therefore, we are limited to comparison for 2018 for this report card.
Virginia Data Source	Virginia Behavioral Risk Factor Surveillance System (BRFSS), 2016-2019. BRFSS consists of an annual telephone survey of a representative sample of Virginia's adult population (age 18+) about health-related risk behaviors, chronic conditions, and the use of preventive services. BRFSS surveys are conducted in all 50 states, the District of Columbia, and U.S. territories. A work group of staff from the CDC, in conjunction with state coordinators at Virginia Department of Health, designs the BRFSS questionnaire. Some questionnaire components are consistent year after year, and some are customized by the work group each year.
National Benchmark Data Source	Centers for Disease Control and Prevention, BRFSS Prevalence & Trends Data, 2018

Adults aged 18 and Older Without Dental Insurance Coverage	
Definition	Lack of dental insurance means not having any coverage that pays for some or all of a person's routine dental care, including prepaid dental insurance plans.
Numerator	The number of surveyed adults ages 18+ who reported lacking any form of dental insurance.
Denominator	The total number of surveyed adults ages 18+.
Limitations	The age range for the national benchmark varies slightly from the Virginia indicator; in Medical Expenditure Panel Survey, the age group used to calculate national dental insurance coverage for adults is 19 and older. In the Virginia BRFSS, the age group is 18 and older. Additionally, data were not collected for this indicator in 2016.
Virginia Data Source	Virginia Behavioral Risk Factor Surveillance System (BRFSS), 2016-2019. BRFSS consists of an annual telephone survey of a representative sample of Virginia's adult population (age 18+) about health-related risk behaviors, chronic conditions, and the use of preventive services. BRFSS surveys are conducted in all 50 states, the District of Columbia, and U.S. territories. A work group of staff from the CDC, in conjunction with state coordinators at the VDH, designs the BRFSS questionnaire. Some of the questionnaire components are consistent year after year, and some are customized by the work group each year.
National Benchmark Data Source	*Virginia Health Catalyst analysis of* U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey (MEPS), 2019

Population Served by Fluoridated Water Systems	
Definition	Fluoridating community water supplies has been a public health intervention since 1945 to help reduce tooth decay and strengthen teeth. The recommended level of optimal water fluoridation is 0.7 milligrams/liter (mg/L).
Numerator	The population receiving fluoridated water from public community water systems.
Denominator	The population served by public community water systems.
Limitations	Lack of Virginia-specific data on tap water trust and consumption limits how the proportion of fluoridated water can be interpreted.
Virginia Data Source	Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion, Water Fluoridation Reporting System (WFRS), 2014-2018. VDH regularly uses the WFRS to report information about the status of water fluoridation of public water supplies across the state. Areas that rely on private water sources (e.g., well water) are not included in WFRS.
National Benchmark Data Source	Same as the Virginia data source listed above

Appendix C: Organizations Represented in the Workgroup

Centra Health

Delta Dental of Virginia Foundation

DentaQuest

Department of Medical Assistance Services

Mountain Empire Community College

Petersburg Public Library

Tri-Area Community Health

Virginia Association of Free and Charitable Clinics

Virginia Board of People with Disabilities

Virginia Community Healthcare Assocation

Virginia Department of Health

Virginia Department of Behavioral Health and Developmental Services

Virginia Dental Association Foundation

Virginia Health Care Foundation

Virginia Health Catalyst

Virginia Health Information

Virginina's Family Physicians

West End Orthodontics

YWCA Richmond

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