

# 2016 Virginia Oral Health Report Card

## Methodology

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## Introduction

Virginia Health Catalyst facilitated the development of the *2016 Virginia Oral Health Report Card* between March and November 2016. Early on, Catalyst staff researched examples of other report card projects on a variety of health-related topics, reaching out to organizations across the country that have developed report cards in various areas of public health at the state and national levels. These interviews provided insights on stakeholder engagement, communication, report card format and design, and handling data limitations. This valuable guidance affirmed Catalyst's plans to approach the *Report Card* development in a manner that was both rigorous and, above all, transparent. Inclusiveness, openness, and collaboration were important guiding principles of *2016 Virginia Oral Health Report Card* design process. The result is a marker of Virginia's progress towards achieving oral health owned by everyone involved.

## External Stakeholder Engagement

Catalyst officially initiated its stakeholder engagement at the first *Report Card* meeting on May 2, 2016. Almost 40 attended the kick-off meeting, including representatives of local and state agencies, community-based organizations, provider associations, safety net clinics, medical and dental providers, and charitable foundations, among others. Catalyst then convened a work group which met six more times between May and the release of the *Report Card* at Catalyst's annual summit in November. Work group members assisted in the refinement of the list of measures<sup>1</sup>; identifying and analyzing state-level survey data; and shaping the content of the *Report Card Companion Narrative*. The proceedings of these meetings and accompanying materials are available on the [Catalyst's Report Card work group website](#). Partners at the Virginia Department of Medical Assistance Services (DMAS) and the Virginia Department of Health (VDH) supplied timely, relevant data and technical assistance.

## Indicator Selection from State-Level Data Sources

To facilitate the selection of indicators in various domains of oral health across the lifespan, Catalyst compiled a list of potential indicators pooled from a variety of state-level data sources. Catalyst then grouped the indicators into categories based on the [Virginia Oral Health Plan](#). Work group 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 inclusion of measures in the *Report Card* are listed in Table 1 on the next page.

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<sup>1</sup> The terms "indicators" and "measures" are used interchangeably to describe the nine data points included in the *2016 Virginia Oral Health Report Card*.

**Table 1: Selection Criteria for Report Card Indicators**

<b>Relevance</b>	<b>Data Characteristics</b>
<ul style="list-style-type: none"> <li>• Will the indicator increase awareness of the importance of oral health (i.e., how “compelling” and “impactful” is this indicator)?</li> <li>• Is the indicator meaningful for advocacy and education efforts?</li> <li>• Is the indicator useful to inform strategic planning for specific areas of oral health quality improvement?</li> <li>• Is the indicator tracked at the national level as well as the state level?</li> </ul>	<ul style="list-style-type: none"> <li>• Is the indicator sensitive to change over time?</li> <li>• Are current and historical data available to provide trend information?</li> <li>• Do national data exist for this indicator to provide a benchmark for comparison?</li> <li>• Does the state agency collecting data on this indicator plan to continue data collection?</li> <li>• Can the data be aggregated by sub-state geographic unit (e.g., Health Planning Region, Health Planning District, county or city, or zip code)?</li> <li>• Can the data be stratified to examine differences by demographic characteristics such as age, race/ethnicity, income, or education?</li> </ul>

Each of the *Report Card* measures met a majority of the criteria described above. However, due to a lack of data meeting the selection criteria, certain important sub-groups within Virginia are not represented by the *Report Card* indicators, such as individuals with disabilities. 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. Some examples of data gaps are presented in the *Report Card Companion Narrative* (available on [Catalyst website](#)). 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

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. However, some of the selected indicators do not have data available to assess the trend over a consistent timeframe. In light of Virginia’s vision to become the healthiest state in the nation, the grading methodology presented below provides grades 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. Links to the national data sources are provided in the *Data Details* section that follows. 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. 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 timeframe of the data collection. In addition, it should be noted that none of the 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.

## Methodology 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.<sup>2</sup> The letter grades have certain point values associated with them, as described in Table 2 below.

**Table 2: Grading Criteria for Each Indicator**

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

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* in order 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 the Virginia and national percentages; number of points awarded; and grade.

Table 4 on the next page shows the 4-point grading scale used to assign Virginia's overall grade. Using this scale, Virginia receives an overall score of C+ because the average of all the indicators' scores equals 2.5 points.

<sup>2</sup> The following formula is used to calculate the relative difference between Virginia's percentages and national percentages:

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

**Table 3: Detailed Report Card Rubric**

Indicator	Desired Trend	VA %	US %	% Difference	Points	Grade
Children aged 1-2 who had a preventive dental visit through Medicaid	↑	23.7	22.2	6.8	2	C
Children aged 1-20 who had a preventive dental visit through Medicaid	↑	53.2	45.4	17.2	3	B
Third graders who have experienced tooth decay	↓	47.4	49.0	-3.3	2	C
Third graders who have dental sealants on permanent molars	↑	52.0	37.6	38.3	4	A
Medicaid pediatric medical providers applying fluoride varnish	↑	4.5	--	--	--	I
Pregnant women who visited a dentist during pregnancy	↑	43.6	49.0	-11.0	1	D
Adults aged 45-64 who have lost at least one tooth because of tooth decay or gum disease	↓	49.6	54.4	-8.8	2	C
Population served by fluoridated water systems	→	96.3	79.6	21.0	4	A
Adults aged 18 and older who do not have dental coverage	↓	37.7	38.9	-3.1	2	C
<b>AVERAGE</b>					<b>2.5</b>	<b>C+</b>

**Table 4: Grading Scale**

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

## Data Details

This section includes the following details for each of the *Report Card* indicators:

- Definition (if applicable)
- Numerator
- Denominator
- Virginia and national benchmark data sources
- Description of Virginia data source
- Limitations of Virginia data source
- Historical performance in Virginia and select characteristics of the sample (if applicable)
- Grade

Where multiple indicators originated from the same Virginia data source, the descriptions are repeated. Note that historical data are presented and explained for certain indicators, but not for all, dependent on availability. Limitations for national benchmark datasets are not presented here. Detailed explanations of the national benchmark datasets can be found at the links provided.

### Oral Health of Virginia's Children

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#### Children ages 1-2 enrolled in Medicaid/FAMIS that received a preventive dental service

*Numerator:* 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.

*Virginia Data Source:* [Virginia Department of Medical Assistance Services](#), *Virginia Smiles for Children – State Fiscal Year 2015 Pediatric Dental Participation Report*.

*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 2015](#).

*Description of Virginia Data Source:* 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 EPSDT guidelines.<sup>1</sup> 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 age 1 were excluded from the *Report Card* indicators because some children do not get their first teeth until 6 months to 1 year of age, skewing the utilization rate.

*Limitations:* The federal fiscal year (FFY) timeframe for the national data is 10/1/2014 to 9/30/2015, different from Virginia's data which is from the state fiscal year (SFY) timeframe of 7/1/2014 to 6/30/2015.

*History:* DMAS shared utilization data from SFY 2010-2011 to provide trend information. As shown in Table 5, the 1 to 2-year-old age group has lower utilization of preventive dental services compared to children in all other age groups, in spite of an overall increase in utilization over time.

**Table 5: Utilization of Preventive Dental Services among Virginia Children Enrolled in Medicaid or FAMIS by Age Group, SFY 2010-2011 & 2014-2015**

Age Group	2010-2011	2014-2015
Overall preventive service utilization, ages 1-20	46.1%	53.2%
1-2	17.7%	23.7%
3-5	48.5%	55.9%
6-9	58.5%	65.3%
10-14	54.9%	61.0%
15-18	44.4%	49.4%
19-20	22.8%	26.5%

Source: Virginia Department of Medical Assistance Services Virginia Smiles for Children – State Fiscal Year 2011 & 2015 Pediatric Dental Participation Reports.

*Grade:* Virginia received a “C” for the percentage of children aged 1-2 enrolled in Medicaid/FAMIS who had a preventive dental service. Virginia’s performance is approximately 7% better than the national benchmark.

### Children ages 1-20 enrolled in Medicaid/FAMIS that received a preventive dental service

*Numerator:* Number of children enrolled in Medicaid/FAMIS aged 1-20 who received preventive dental services.

*Denominator:* Total children enrolled in Medicaid/FAMIS aged 1-20 with 90-day continuous enrollment.

*Virginia Data Source:* [Virginia Department of Medical Assistance Services \(DMAS\)](#), Virginia Smiles for Children – State Fiscal Year 2015 Pediatric Dental Participation Report.

*National Benchmark Data Source:* [Centers for Medicare and Medicaid Services, Annual EPSDT Participation Report – Form CMS 416 \(National\), Fiscal Year 2015.](#)

*Description of Virginia Data Source:* See description from [previous section](#).

*Limitations:* See description from [previous section](#).

*History:* See description from [previous section](#).

*Grade:* Virginia received a “B” for the percentage of children aged 1-20 enrolled in Medicaid/FAMIS who had a preventive dental service. Virginia’s performance is approximately 17% better than the national benchmark.

### Third graders with tooth decay

*Definition:* This indicator measures “caries experience,” meaning that a child has had “decay in the primary (baby) and/or permanent (adult) teeth in the past, (including fillings, crowns, or teeth that have been extracted because of decay) or at the time of exam, including untreated tooth decay.”<sup>ii</sup> Cases of caries

experience include those who have treated decay, untreated decay, or both. Fractured teeth and teeth extracted for orthodontic reasons are not included.<sup>ii</sup>

*Numerator:* Number of third grade children with treated decay, untreated decay, or both in their primary and/or permanent teeth.

*Denominator:* Total number of third grade children enrolled in Virginia public schools whose parents consented to the child's participation in the open-mouth survey.

*Virginia Data Source:* [Virginia Department of Health, Office of Family Health Services](#), Virginia Statewide Basic Screening Survey of (BSS) Third Grade Children, 2014-2015

*National Benchmark Data Source:* [U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion Healthy People 2020 OH-1.2 target](#), based on data from the Centers for Disease Control and Prevention, National Center for Health Statistics (CDC/NCHS), National Health and Nutrition Examination Survey (NHANES), 1999-2004.

*Description of Virginia Data Source:* This indicator is from the Virginia Statewide Basic Screening Survey (BSS) of Third Grade Children conducted by VDH. The BSS provides representative, population-level data on a random sample of third grade children in Virginia's public schools with 20 or more third grade students. Open-mouth survey data provides estimates of the prevalence of tooth decay (treated and untreated) and sealant placement, and a parental questionnaire assesses the child's dental insurance status and issues with access to care, such as unmet dental need. The sample is stratified by Health Planning Region, race/ethnicity, and participation in the National School Lunch Program (NSLP), an indicator of socioeconomic status.<sup>ii</sup>

The BSS is conducted every five years. The data used to grade Virginia against national performance on tooth decay and sealant prevalence is from the 2014-2015 school year, the most recent year of data available. Catalyst also worked with VDH to access historical data on tooth decay and sealants among third graders from the 2009 wave of the BSS to provide context on the trend in Virginia.

*Limitations:* As with all public health surveillance data, the BSS can be used to plan, monitor, and evaluate public health practice.<sup>iii</sup> However, no conclusions can be made about longitudinal trends due to changes in the sampling frame between survey years.

*Analyzing trends over time:* The *History* section below presents historical data and interpretation for this indicator. There are limitations to making direct comparisons between the 2009 and 2014-2015 survey data. The first issue is different sample sizes. In 2009, nearly 8,000 students were surveyed, while approximately 5,600 students were surveyed in the 2014-2015 sample.<sup>ii</sup> The smaller sample size in the 2014-2015 survey produces less precise estimates and therefore larger confidence intervals around these estimates. Another issue that should be kept in mind when considering data from clinical surveys, such as BSS, is that there may be some tendency for examiners to 'drift' from the examination standard over the course of the survey, yielding less accurate assessments over time as the survey progresses. Given that some of the indicators between the 2009 and 2014-2015 survey appear significantly different, these two factors (less statistical certainty in the 2014-2015 survey and examiner drift) should be considered as a potential source of these differences.

*History:* Table 6 (on the next page) provides data from the 2009 and 2014-2015 BSS, including the overall percentage of Virginia third graders with tooth decay in their primary or permanent teeth and demographic stratifications of the population. Between 2009 and 2014-2015, the proportion of Virginia third graders with tooth decay remained practically unchanged. In 2009, tooth decay was significantly lower in the Northern region of Virginia, and significantly higher in the Southwestern region. In 2014-2015, the proportion of African American third graders and children enrolled in the National School Lunch Program (NSLP; free and reduced lunch program) was significantly higher than other groups. The Southwestern and Northwestern regions saw significantly higher tooth decay, while the Northern region again saw significantly lower tooth decay.<sup>ii</sup>

**Table 6: Select Characteristics of Virginia’s Third Grade Children with Decay Experience in Primary or Permanent Teeth, 2009 & 2014-2015**

	2009		2014-2015	
	Weighted Percent	95% Confidence Interval	Weighted Percent	95% Confidence Interval
Overall % with tooth decay	47.4	(44.9, 49.6)	47.2	(47.1, 47.7)
Race/ethnicity				
White	45.2	(44.8, 45.7)	44.2	(41.2, 47.2)
Black	50.3	(49.6, 51.0)	<b>51.8</b>	(47.7, 56.0)
Hispanic	54.0	(52.9, 55.2)	51.0	(45.8, 56.3)
Asian	51.8	(50.5, 53.1)	46.4	(40.5, 52.3)
Native American	47.8	(41.2, 54.4)	--	--
Other	44.5	(43.3, 45.8)	48.1	(42.7, 53.5)
NSLP Participation				
No	41.3	(40.9, 41.7)	39.8	(37.3, 42.4)
Yes	61.5	(61.0, 62.1)	<b>58.8</b>	(55.6, 62.1)
Dental insurance				
No	49.3	(48.4, 50.2)	50.6	(45.2, 56.0)
Yes	46.9	(46.5, 47.2)	46.8	(44.4, 49.2)
Region				
Central	48.3	(47.5, 49.1)	<b>50.1</b>	(42.3, 57.8)
Eastern	47.7	(47.1, 48.4)	43.4	(40.2, 46.6)
Northern	<b>40.5</b>	(39.9, 41.1)	38.0	(34.4, 41.6)
Northwestern	45.4	(44.6, 46.3)	<b>62.6</b>	(55.4, 69.7)
Southwestern	<b>59.6</b>	(58.8, 60.4)	<b>54.9</b>	(48.0, 61.7)

\* **Bold text denotes significant findings**

Source: Virginia Department of Health, Office of Family Health Services, Virginia Statewide Basic Screening Survey of Third Grade Children, 2009 & 2014-2015.

*Grade:* Virginia received a “C” for the percentage of third graders with tooth decay. Virginia’s performance is approximately 3% worse than the national benchmark.

### Third grade children with dental sealants on permanent molars

*Definition:* Dental sealants are thin, plastic coatings that are painted onto the chewing surfaces of back teeth (premolars and molars). The sealant bonds into the grooves of teeth to form a protective barrier over the tooth enamel. In this sample, decay was surveyed on the first permanent molars (sometimes called the “six-year” molars because they come in between the ages of 5 and 7).<sup>ii</sup>

*State Data Source:* [Virginia Department of Health, Office of Family Health Services](#), Virginia Statewide Basic Screening Survey of (BSS) Third Grade Children, 2014-2015

*National Data Source:* National percentage retrieved from the [U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion Healthy People 2020](#) objectives, based on data from the Centers for Disease Control and Prevention, National Center for Health Statistics (CDC/NCHS), National Health and Nutrition Examination Survey (NHANES), 2011-2012.

*Description of Virginia Data Source:* See description from [previous section](#).

*Limitations:* See description from [previous section](#).

*History:* Table 7 provides data from the 2009 and 2014-2015 BSS, including the overall percentage of Virginia third graders with dental sealants on their permanent molars and demographic stratifications of the population. Overall, the statewide percentage of third graders with dental sealants only increased marginally between the 2009 and 2014-2015 surveys. The 2009 survey revealed significant disparities by race/ethnicity, dental insurance status, geographic region, and participation in the National School Lunch Program (NSLP; free and reduced lunch program). In 2014-2015, no statistically significant disparities were found by race/ethnicity, NSLP participation, or region, although significantly fewer children without dental insurance had dental sealants compared to children with dental insurance.<sup>ii</sup>

**Table 7: Select Characteristics of Virginia’s Third Grade Children with Sealants on Permanent Molars, 2009 & 2014-2015**

	2009		2014-2015	
	Weighted Percent	95% Confidence Interval	Weighted Percent	95% Confidence Interval
Overall % with sealants	49.4	(49.0, 49.7)	52.0	(49.5, 54.5)
Race/ethnicity				
White, non-Hispanic	<b>53.8</b>	(53.3, 54.2)	54.2	(51.2, 57.3)
Black, non-Hispanic	41.3	(40.6, 42.0)	48.1	(43.8, 52.4)
Hispanic	43.2	(42.0, 44.3)	49.8	(44.5, 55.2)
Asian	44.6	(43.3, 45.9)	53.8	(48.6, 59.1)
Native American	48.4	(41.9, 55.1)	--	
Other	51.1	(49.8, 52.3)	48.4	(43.7, 53.1)
NSLP Participation				
No	51.3	(51.0, 51.7)	53.3	(50.5, 56.2)
Yes	<b>44.3</b>	(43.7, 44.9)	50.2	(46.7, 53.8)
Dental insurance				
No	34.3	(33.4, 35.2)	<b>38.0</b>	(32.9, 43.1)
Yes	<b>52.9</b>	(51.8, 52.5)	54.1	(51.6, 56.6)
Region				
Central	<b>53.7</b>	(52.9, 54.5)	53.9	(47.8, 59.9)
Eastern	50.7	(50.0, 51.4)	47.5	(42.8, 52.2)
Northern	<b>52.4</b>	(51.8, 53.0)	55.9	(51.7, 60.1)
Northwestern	46.4	(45.6, 47.2)	54.4	(47.2, 61.7)
Southwestern	40.3	(39.5, 41.1)	45.6	(38.8, 52.4)

\* **Bold text denotes significant findings.** Source: Virginia Department of Health, Office of Family Health Services, Virginia Statewide Basic Screening Survey of Third Grade Children, 2009 & 2014-2015.

*Grade:* Virginia received an “A” for the percentage of third graders with dental sealants. Virginia’s performance is approximately 38% better than the national benchmark.

## Strengthening Medical-Dental Collaboration

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### Medicaid Pediatricians and Pediatric Nurse Practitioners Applying Fluoride Varnish

*Definition:* Fluoride varnish is a highly concentrated fluoride lacquer that is applied by a medical or dental professional to the tooth surfaces to prevent decay. It can be applied to primary and permanent teeth.<sup>iv</sup>

*Numerator:* Number of Medicaid providers (pediatricians and pediatric nurse practitioners) billing for fluoride varnish application on patients ages 1-2 in 2016.

*Denominator:* Total number of Medicaid providers (pediatricians and pediatric nurse practitioners) eligible to bill for fluoride varnish application on patients ages 1-2 in 2016.

*Virginia Data Source:* DMAS, 2016.

*National Data Source:* None

*Description of Virginia Data Source:* In addition to utilization data, DMAS also supplied data on claims and reimbursement for the application of fluoride varnish for patients ages 1 to 2 as of October 2016, including the provider number and type. This information was used to calculate the proportion of eligible pediatric medical providers that billed Medicaid for fluoride varnish application in 2016.

*Limitations:* The denominator (total number of eligible providers) is restricted to include only pediatric physicians and nurse practitioners who billed for fluoride varnish application on patients ages 1 to 2 in 2016. Other types of providers (such as Licensed Practical Nurses, Registered Nurses, and Physician Assistants) are eligible to bill Medicaid for fluoride varnish, but it is not possible to separate out claims by those provider types. As such those provider types were excluded from the denominator. No federal-level measure is accessible to provide a national benchmark for comparison.

*History:* In Virginia, certain types of pediatric medical providers are eligible to bill Medicaid and be reimbursed for applying fluoride varnish twice a year. In 2013, only 169 pediatric medical providers billed Medicaid for the application of fluoride varnish. By 2016, the number has increased by 48% to 386 billing providers, as shown in Table 8.

**Table 8: Proportion of Pediatricians and Pediatric Nurse Practitioners Billing for Fluoride Varnish Application in Virginia, 2016**

Overall proportion	4.5%
Total number of billing providers	386
Total number of eligible providers	8,556

Source: Virginia Department of Medical Assistance Services, 2016.

*Grade:* No national benchmark exists against which to compare Virginia's performance; therefore, Virginia received an "I" for "incomplete." Going forward, Virginia may elect to measure its progress relative to historical performance rather than looking outward to how we compare nationally.

## Oral Health of Virginia's Adults

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### Pregnant women who visited a dentist during pregnancy

*Numerator:* Number of women who reported having a visit to a dentist or dental clinic during pregnancy.

*Denominator:* Total number of surveyed women with live births.

*Virginia Data Source:* [Virginia Department of Health, Office of Family Health Services, Pregnancy Risk Assessment Monitoring System \(PRAMS\), 2010-2011](#)

*National Data Source:* [CDC, National Center for Chronic Disease Prevention and Health Promotion, PRAMStat, 2011](#)

*Description of Virginia Data Source:* 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 40 states and represents approximately 75% of births in the U.S. In Virginia, VDH conducts the survey by mail or by telephone (for those who do not respond to the mail survey).<sup>v</sup> Standardized data collection procedures and instruments allow comparisons to be made between states. The sample populations are weighted to produce representative population-level estimates across a range of survey topics, including: barriers to and content of prenatal care, obstetric history, maternal use of alcohol and cigarettes, physical abuse, contraception, economic status, maternal stress, and early infant development and health status.<sup>vi</sup>

Virginia PRAMS survey results are compiled in phases. The most recent years of compiled data available are 2012 to 2015 (phase 7) and 2009 to 2012 (phase 6). Phase 8 of data collection (2016-2019) is currently under way, and will be analyzed and release in 2020. The *Report Card* uses Phase 6 (specifically 2010-2011) data because that is the only phase for which comparable national data from the same time period is available. The phase 6 questionnaire included questions on the care of a woman's teeth during her most recent pregnancy, such as: whether or not she knew the importance of caring for teeth and gums during pregnancy; whether a dental or other health care worker talked with her about how to care for her teeth and gums; whether she had her teeth cleaned by a dentist or dental hygienist; whether or not she had dental insurance coverage; whether or not she needed to see a dentist for a problem; and whether or not she went to see a dentist or dental clinic about a problem.

*Limitations:* Due to smaller sample size, demographic characteristics are not presented here. The sample in 2007 was much smaller than 2010-2011; therefore, comparing historical data to most recent available data is limited.

*History:* In 2007, 41% of women reported having a dental visit during pregnancy, whereas in 2010-2011 44% of women reported having a dental visit during pregnancy. It is important to note that this measure

is based on data collected prior to March 2015, when Virginia added a comprehensive Medicaid dental benefit for pregnant enrollees.<sup>3</sup>

*Grade:* Virginia received an “D” for the percentage of women reporting a dental visit during pregnancy. Virginia’s performance is approximately 11% worse than the national benchmark.

### Adults ages 45-64 who have lost at least one tooth because of tooth decay or gum disease

*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:* Number of surveyed adults ages 45-64 reporting at least one permanent tooth lost due to tooth decay or gum disease.

*Denominator:* Total number of surveyed adults ages 45-64.

*Virginia Data Source:* [CDC, Virginia Behavioral Risk Factor Surveillance System \(BRFSS\), 2015](#)

*National Data Source:* [CDC, National BRFSS, 2014](#)

*Description of Virginia Data Source:* This indicator is from the Virginia Behavioral Risk Factor Surveillance System (BRFSS). 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 use of preventive services. BRFSS surveys are conducted in all 50 states, the District of Columbia, and three U.S. territories.<sup>vii</sup> The BRFSS questionnaire is designed by a work group of staff from the CDC in conjunction with state coordinators at the VDH. Some of the questionnaire components are consistent year after year, and some of the components are customized by the work group each year.<sup>viii</sup> Most indicators can be stratified by demographic characteristics such as race/ethnicity, income level, education level, and Health Planning Region or Health Planning District.

Oral health questions in BRFSS include dental visits within the past year, number of permanent tooth extractions due to tooth decay or gum disease, and edentulism (complete tooth loss) among individuals age 64 and older. Other potentially useful indicators include chronic disease status (such as diabetes or hypertension). For these indicators, the most recent data collection was in 2015, and historical data are available as far back as 1999. In 2010 and 2013 the VDH state coordinators added additional questions to determine the prevalence of dental coverage. These questions may be repeated in future surveys but they are not part of the fixed core component of BRFSS.

*Limitations:* In 2011, the CDC adjusted the BRFSS methodology due to a rapid increase in U.S. households with cellphone only and no landline telephone. Moving forward, BRFSS also included cellular households to maintain survey validity and coverage, especially for individuals who are more likely to be at higher risk for poor health outcomes: those with lower incomes, lower education attainment, and those in younger age groups. This new method might increase prevalence estimates for health risk behaviors and chronic disease in many states. This discrepancy in prevalence estimates would also vary by question and state, based on demographic variables used for ranking as well as the prevalence of cellular households. In

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<sup>3</sup> [http://www.coverva.org/programs\\_medicaid.cfm](http://www.coverva.org/programs_medicaid.cfm)

Virginia, statistics for the year 2010 on utilization of telephone services indicated that 21.2% of households were “Wireless Only”, 17.9% were “Wireless Mostly”, 30.5% were “Dual Use”, 10.0% were “Landline Only”, 18.6% were “Landline Mostly” and 1.8% of households had no phone use at all.<sup>ix</sup> Recent statistics on utilization of telephone services indicate that 43.3% of households are “Wireless Only”, 17.4% are “Wireless Mostly”, 21.2% are “Dual Use”, 5.5% are “Landline Only”, 10.1% are “Landline Mostly” and 2.4% of households have no phone use at all.<sup>x</sup>

It should be emphasized that change in prevalence estimates for health conditions might not represent real trends in risk factor prevalence but may reflect improved methods for measuring risk factors. Moreover, periodic improvements in methodology are necessary for all public health surveillance systems and change in the BRFSS methodology in 2011 was necessary to keep up with shifts in telephone use and to reap the benefits of improved statistical methods.

In addition, national data for 2015 was not available, necessitating the use of 2014 BRFSS data to provide the most recent available estimate.

*History:* The age range for this indicator was restricted to 45-64 in part to mirror the national Healthy People 2020 objective OH-4.1.<sup>xi</sup> Unlike the Healthy People 2020 objective, which uses NHANES data to calculate the national percentage, the *Report Card* uses BRFSS data. This is due to the fact that BRFSS provides a more ambitious target, estimating the national percentage to be 54.4%, whereas the *Healthy People 2020* objective OH-4.1 is 68.8%.

Table 9 (next page) presents estimates from 2010 and 2015 survey data on the tooth loss related to tooth decay or gum disease among adults ages 45 to 64 in Virginia. In both survey years, significant differences were noted according to income and education level. In 2010, a significantly lower proportion of adults making \$50,000 or more in annual household income had lost teeth to decay or disease, and a significantly greater proportion of adults with less than a high school education had lost teeth. In 2015, lower-income individuals and those with less than a high school education had significantly higher proportions of tooth loss due to decay or disease.

**Table 9: Select Characteristics of Virginia Adults Ages 45-64 who Have Lost At Least One Permanent Tooth due to Tooth Decay or Gum Disease, 2010 and 2015**

	2010		2015	
	Weighted Percent	95% Confidence Interval	Weighted Percent	95% Confidence Interval
Overall % with any extractions	48.8	(46.1, 51.5)	49.6	(47.3, 51.9)
Number of teeth extracted				
1 to 5	32.7	(30.1, 35.3)	32.7	(30.5, 35.0)
6 or more (including all)	16.3	(14.2, 18.3)	16.8	(15.1, 18.6)
Race/ethnicity				
White, non-Hispanic	45.3	(42.2, 48.4)	44.1	(41.6, 46.6)
Black, non-Hispanic	68.8	(63.3, 76.2)	<b>68.8</b>	(63.6, 74.0)
Hispanic	DSU	--	DSU	--
Other race, non-Hispanic	DSU	--	DSU	--
Multiracial, non-Hispanic	DSU	--	DSU	--
Income				
<\$25,000	69.7	(62.5, 76.8)	<b>74.1</b>	(68.6, 79.6)
\$25,000 to <\$50,000	63.0	(57.3, 68.8)	61.8	(56.2, 67.3)
≥\$50,000	<b>38.6</b>	(34.7, 42.5)	38.0	(35.0, 41.0)
Educational attainment				
Less than H.S.	<b>80.4</b>	(73.4, 87.4)	<b>83.3</b>	(75.7, 91.0)
H.S. degree	66.5	(61.3, 71.8)	59.5	(55.0, 63.9)
Some college or college degree	38.6	(35.3, 42.0)	39.5	(36.7, 42.4)
Region				
Central	--	--	53.9	(48.9, 58.9)
Eastern	--	--	55.0	(50.7, 59.4)
Northern	--	--	<b>35.7</b>	(30.1, 41.3)
Northwestern	--	--	50.0	(44.9, 55.1)
Southwestern	--	--	61.0	(56.8, 65.1)

DSU = Data statistically unreliable, confidence intervals exceed 20 percentage points

\* **Bold text denotes statistically significant findings**

Source: CDC, Virginia BRFSS, 2010 & 2015.

*Grade:* Virginia received an “C” for the percentage of adults ages 45-64 who have lost at least one tooth due to tooth decay or gum disease. Virginia’s performance is approximately 9% worse than the national benchmark.

### Adults ages 18 and older without dental insurance coverage

*Definition:* Lack of dental insurance means not having any kind of insurance coverage that pays for some or all of a person’s routine dental care, including dental insurance prepaid plans.

*Numerator:* Number of surveyed adults ages 18+ who reported lacking any form of dental insurance.

*Denominator:* Total number of surveyed adults ages 18+.

*Virginia Data Source:* [CDC, BRFSS, 2013](#)

National Data Source: [U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey \(MEPS\), 2013](#)

Description of Virginia Data Source: See description from [previous section](#).

Limitations: See description from [previous section](#). In addition, the age range for the national benchmark varies slightly from the Virginia indicator; in MEPS, 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.

History: Table 10 provides the overall percentage of Virginia adults (age 18+) who did not have dental insurance in 2010 or 2013, along with demographic characteristics. In both 2010 and 2013, a significantly higher proportion of adults with low annual household income (less than \$25,000) and adults with less than a high school education lacked dental insurance. In 2013, Hispanic adults comprised a significantly higher proportion of the adult population lacking dental coverage.

**Table 10: Select Demographic Characteristics of Virginia Adults ages 18+ who Lack Dental Insurance, 2010 and 2013**

	2010		2013	
	Weighted Percent	95% Confidence Interval	Weighted Percent	95% Confidence Interval
Overall	30.3	(27.3, 33.4)	37.7	(36.2, 39.2)
Race				
White, non-Hispanic	29.3	(26.1, 32.4)	36.3	(34.7, 37.9)
Black, non-Hispanic	32.2	(24.1, 40.2)	37.7	(33.5, 41.8)
Hispanic	DSU	--	<b>60.0</b>	(52.8, 67.1)
Other race, non-Hispanic	DSU	--	29.5	(21.3, 37.7)
Multiracial, non-Hispanic	DSU	--	DSU	--
Income				
<\$25,000	<b>64.9</b>	(58.2, 71.7)	<b>71.7</b>	(68.6, 74.7)
\$25,000 to <\$50,000	38.2	(27.9, 48.6)	42.2	(38.9, 45.5)
≥\$50,000	13.5	(10.7, 16.2)	16.2	(14.4, 18.1)
Educational attainment				
Less than H.S.	<b>63.5</b>	(53.8, 73.2)	<b>67.9</b>	(62.7, 73.0)
H.S. degree	37.1	(30.2, 44.0)	47.7	(44.7, 50.8)
Some college or college degree	24.2	(20.6, 27.7)	26.9	(25.2, 28.6)
Region				
Central	--	--	34.8	(31.7, 37.9)
Eastern	--	--	34.7	(31.6, 37.8)
Northern	--	--	28.4	(24.4, 32.3)
Northwestern	--	--	39.5	(36.1, 43.0)
Southwestern	--	--	51.9	(48.9, 54.8)

DSU = Data statistically unreliable, confidence intervals exceed 20%

\* **Bold text denotes statistically significant findings**

Source: CDC, Virginia BRFSS, 2010 & 2013.

Grade: Virginia received an "C" for the percentage of adults ages 18+ who lack dental insurance coverage. Virginia's performance is approximately 3% worse than the national benchmark.

## Sustaining Public Health Prevention

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### Population served by fluoridated community water systems

*Definition:* Fluoridating community water supplies has been used as a public health intervention since 1945 to help reduce tooth decay and strengthen teeth.<sup>xii</sup> The recommended level of optimal water fluoridation is 0.7 milligrams/liter (mg/L).<sup>xiii</sup>

*Numerator:* Number of reported service population on fluoridated community water systems.

*Denominator:* Total reported service population on community water systems.

*Virginia Data Source:* CDC, Water Fluoridation Reporting System (WFRS) Virginia, 2016.

*National Data Source:* [U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion Healthy People 2020 OH-13 target](#), based on data from the CDC WFRS, 2008.

*Description of Virginia Data Source:* VDH regularly uses the WFRS to report information about the status of water fluoridation of public water supplies across the state. CDC collects and summarizes the data every two years to produce national estimates. VDH provided Virginia fluoridation data for 2016 from the WFRS.<sup>xiv</sup> Areas which rely on private water sources (e.g., well water) are not included in WFRS.

*Limitations:* National estimates for 2016 are not yet currently available from CDC; therefore, the national benchmark is the *Healthy People 2020* objective to increase the proportion of the population served by community water systems with optimally fluoridated water to 80% by 2020. Com

*History:* In 2010, the proportion of Virginia's population served by optimally fluoridated community water systems was 95.6%, which did not change substantially by 2016.

*Grade:* Virginia received an "A" for the percentage of the population receiving fluoridated water from community water systems. Virginia's performance is approximately 21% better than the national benchmark.

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- <sup>ii</sup> Virginia Department of Health, Office of Family Health Services, Virginia Statewide Basic Screening Survey of Third Grade Children, 2014-2015.
- <sup>iii</sup> World Health Organization. Health topics: Public health surveillance. Available at [http://www.who.int/topics/public\\_health\\_surveillance/en/](http://www.who.int/topics/public_health_surveillance/en/). Accessed on November 8, 2016.
- <sup>iv</sup> American Academy of Pediatrics. Policy Statement: Maintaining and Improving Oral Health of Young Children. *Pediatrics*. 2014;134(6): 1224-1229. Available at: <http://pediatrics.aappublications.org/content/134/6/1224.full.pdf+html>. Accessed October 28, 2016.
- <sup>v</sup> Virginia Department of Health. Pregnancy Risk Assessment and Monitoring System. 2016. Available at <http://166.67.66.226/livewell/data/surveys/prams/about.html>. Accessed on November 8, 2016.
- <sup>vi</sup> Centers for Disease Control and Prevention. PRAMS: Methodology. 2016. Available at <http://www.cdc.gov/PRAMS/methodology.htm>. Accessed on November 8, 2016.
- <sup>vii</sup> Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. 2014. Available at <http://www.cdc.gov/brfss/about/index.htm>. Accessed on November 8, 2016.
- <sup>viii</sup> Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System: BRFSS Questionnaires. 2016. Available at <http://www.cdc.gov/brfss/questionnaires/index.htm>. Accessed on November 8, 2016.
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- <sup>x</sup> Centers for Disease Control and Prevention, National Center for Health Statistical Report. National Health Interview Survey Early Release Program. 2016. Available at [http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless\\_state\\_201608.pdf](http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless_state_201608.pdf). Accessed on November 8, 2016.
- <sup>xi</sup> U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Healthy People 2020 OH-4.1: Reduce the proportion of adults aged 45 to 64 years who have ever had a permanent tooth extracted because of dental caries or periodontal disease. 2016. Available at [https://www.healthypeople.gov/node/5024/data\\_details](https://www.healthypeople.gov/node/5024/data_details). Accessed on November 8, 2016.
- <sup>xii</sup> Centers for Disease Control and Prevention. Community water fluoridation: 70<sup>th</sup> anniversary of community water fluoridation. Available at <http://www.cdc.gov/fluoridation/basics/70-years.htm>. Accessed on November 8, 2016.
- <sup>xiii</sup> US Department of Health and Human Services. Public Health Service Recommendation for Fluoride Concentration in Drinking Water for Prevention of Dental Caries. 2015. Available at <https://www.federalregister.gov/documents/2015/05/01/2015-10201/public-health-service-recommendation-for-fluoride-concentration-in-drinking-water-for-prevention-of>. Accessed on November 8, 2016.
- <sup>xiv</sup> Centers for Disease Control and Prevention. Community water fluoridation: Calculating water fluoridation statistics. 2015. Available at [http://www.cdc.gov/fluoridation/statistics/wf\\_statistics.htm](http://www.cdc.gov/fluoridation/statistics/wf_statistics.htm). Accessed on November 8, 2016.