Introduction

It is widely recognized that oral health—the health of teeth, gums and mouth—is an important component of general health. Traditionally the consequences of poor oral health were viewed in terms of esthetics or localized pain and were compartmentalized from overall health. Recent research, however, has found numerous links from oral health to overall health and well-being.

Oral disease has negative economic consequences for both individuals and society. Problems with teeth, gums or mouth increase consumers’ direct spending on care and also create indirect expenditures through lost worker hours. Expenditures on dental services are expected to increase significantly in the coming decade. Between 2012 and 2020, the Centers for Medicare and Medicaid Services (CMS) project that annual spending on dental services in the United States will climb from $109.6 billion to $167.9 billion, a 53 percent increase in current dollars. These expenditures could be reduced with a greater investment in preventive care, including better oral hygiene habits, more families consuming fluoridated water, and greater use of dental sealants (thin plastic seals applied to chewing surfaces to protect them from decay).

Adults experience reduced hours of work from dental and related problems. Interestingly, preventative visits account for the most episodes of lost time, but the fewest hours of lost work, suggesting that delaying treatment results in greater treatment need. Not only is there a loss in hours worked due to the time needed to receive treatment, but unsatisfactory oral health also appears to affect earnings more generally. Among children, oral disease is correlated with greater absenteeism and below par academic performance. Children with oral health pain are more likely to miss school due to pain and missing school due to pain results in poorer school achievement.

This article, which is drawn in part from an earlier Cooper Center study, examines oral health in Virginia. The topic is divided into six parts. (1) A review of the progress that Virginia’s residents have made in dental care access and oral health over the years and disparities that remain. (2) A description of dental care resources available within the state. (3) An examination of policy actions at the state and national level that influence utilization of dental care. (4) An explanation of past and ongoing oral health strategic planning processes and the ramifications of the Affordable Care Act. (5) A comparison of state policies to national best practice benchmarks. (6) An assessment of evidence regarding the effectiveness of various proposed policy actions. With this knowledge a practical roadmap to better policy effectiveness is drawn up.
Progress That Virginia’s Residents Have Made in Dental Care and Disparities That Remain

There are many factors that ultimately determine an individual’s oral health, including use of dental services, oral hygiene behaviors, dietary choices, tobacco use, genetics, tastes and preferences, and age. This section examines the performance of Virginia over time compared to the nation on important dimensions of oral health, including dental caries (also known as tooth decay or a cavity) and tooth loss. Utilization of dental services plays an important role in oral health. Also, dental insurance is an important component in the decision to seek care. These three areas—oral health conditions, utilization, and insurance—have also been the targets of public policies to improve oral health outcomes.

Oral Health Conditions

Over the past few decades, oral health has improved dramatically for the average American. The provision of dental sealants for children and adults has increased, resulting in a lower incidence of tooth decay. Also, the elderly are less likely to have total tooth loss and periodontitis because of improved dental care utilization and lower lifetime prevalence and severity of dental disease. These trends are evident in Virginia too, with the state performing somewhat better than the national average. However, limited data availability, small sample sizes and significant time lags in data release pose a challenge in monitoring and comparing changes in national and state oral health conditions. The principal sources of data on state oral health come from the Virginia Department of Health [including data collected as part of the Centers for Disease Prevention and Control (CDC) Behavioral Risk Factor Surveillance System (BRFSS) initiative], periodic third grade public school clinical dental screenings and parental questionnaires, and administrative records describing application of treatments and utilization levels for programs targeted at low-income children such as Medicaid and Family Access to Medical Insurance Security (FAMIS).

Data available from samples of Virginia third grade public school clinical dental screenings suggest that child oral health improved in the decade from 1999-2009. The percentage of children with sealants improved from 36 percent to 49.4 percent, while those with untreated caries (dental cavities or tooth decay) dropped from 27 percent to 15.4 percent. Virginia children do comparatively well, with the third lowest incidence among states for untreated tooth decay and eighth best for percentage with dental sealants. If Virginia’s experience mirrors the nation in other ways, progress among child subgroups is uneven, with preschoolers, young males, ethnic minorities and low-income children cohorts doing poorer than previous cohorts on some oral health indicators.

Adult dental health in Virginia has improved markedly as well. The percentage of adults 65 and over missing any teeth (the edentulous population) dropped from 29.4 percent in 1999 to 15 percent in 2010, a better rate of improvement than the median for all states (from 26.2 percent to 16.9 percent) over the same time period (see Figure 1). The same pattern of improvement was evident for seniors missing any teeth. In Virginia they dropped from 55.2 percent in 1999 to 38.6 percent in 2010.

Utilization of Dental Care

Among the reasons for continued improvements to oral health are increased utilization of dental care, improved quality of dental care, improved technology, dietary changes, better oral hygiene practices, and widespread adoption of fluoridation in public water supplies and fluoride in dental hygiene products. Nationwide, utilization of dental services increased dramatically from a little over 30 percent for adults 18 and over in 1950 to 66 percent in 1998 before leveling off. As a result of general improvement in oral health, demand for dental services has shifted toward preventive, diagnostic, and cosmetic care and away from restorative work.

These national improvements are reflected in Virginia data with some notable differences. In 2010 Virginia adults were more likely to report utilizing dental care in the past year (78.4 percent) than the average U.S. resident (70.1 percent), and recent data suggest that utilization rates have begun to increase again after stalling for several years, a pattern not yet evident in the nation at large (see Figure 2). In 2008, 75.5 percent of Virginia adults reported visiting a dentist or dental hygienist for teeth cleaning. Third grade survey data collected by the Virginia Department of Health in 2009 show that 82.1 percent of third grade children were reported to have visited a dentist in the past year. Additionally, 82.8 percent of those children were reported to have had an exam, check-up, or cleaning as the reason for their last visit, versus 17.2 percent having had treatment.

Despite these impressive figures overall, some segments of the population continue to lag behind. In particular, there are still significant disparities along the dimensions of race, socioeconomic status, and geographical region. Age group and gender differences are generally less pronounced. Figure 3 shows that blacks are less likely to have
visited a dentist or dental clinic in the past year than other racial groups. In addition, residents with higher levels of education exhibit greater utilization levels. The most significant barrier to utilization is financial. Individuals with less than $15,000 in annual household income are only half as likely to report dental care utilization in the last year compared to those with $50,000 or more in income. There is also a strong regional pattern to dental utilization (see Figure 4) with residents in the northern and eastern planning districts of Virginia more likely to report having received dental care than residents of the western and southern districts. This pattern likely reflects underlying demographic and socioeconomic characteristics of the population. But, it also may be influenced
by geographical access to dental care since lower utilization areas are observed in more rural areas where the availability of dentists is lower.

**Dental Insurance**

Research suggests that having dental insurance significantly increases dental utilization levels. Nationally, among those with private dental coverage in 2004, 56.9 percent had a dental visit compared to only 31.9 percent of those with public coverage and 26.9 percent of those with no dental coverage.19 In addition, among people with a dental visit in the last year, having insurance was
associated with more visits per year and higher dental expenditures.\textsuperscript{20}

According to the third grade survey (using a parent questionnaire) conducted by the Virginia Department of Health, 84.8 percent of children statewide had dental insurance in 2009. This result is high in part because the Medicaid program offers comprehensive dental care. In Virginia, children ages 1-5 are eligible for Medicaid if their families are at or below 133 percent of the federal poverty level (FPL). Children ages 6-19 are eligible if their family income is at or below 100 percent of the FPL. The dental insurance under Virginia’s State Children’s Health Insurance Program (SCHIP), called Family Access to Medical Insurance Security (FAMIS), also provides dental insurance and applies to children ages 6-19 whose families are at or below 133 percent of the FPL.

In 2008, 72 percent of Virginia adults reported having dental insurance, according to BRFSS. The percentage of adults covered has increased since 2000 (see Figure 5). Unlike children, adults generally do not have access to publicly funded dental insurance. Aside from pregnant low-income women, Medicaid covers limited medically necessary oral surgery services for adults (age 21 and older) such as emergency extractions. Medicare for seniors does not include dental coverage, a result largely attributable to the opposition of the dental lobby.\textsuperscript{21}

Dental Workforce
Virginia is slightly below the national average for dentists per capita. In 2009, it had a 78 licensed dentists per 100,000 residents compared to 80 dentists per 100,000 residents in the nation.\textsuperscript{22} Dentist-to-population ratios provide one way to gauge access gaps but they are imperfect measures for a variety of reasons, including state differences in per capita demand, average hours practiced, and dentist productivity.\textsuperscript{23}

Within Virginia there are significant regional disparities. Figure 6 shows the distribution of licensed dentists by county in 2010.\textsuperscript{24} The dentist-to-population ratio is generally greater in heavily urbanized regions (such as in Northern Virginia, the Richmond metropolitan area, and the Hampton Roads region) than in rural areas such as the Southwest and Southside regions. Four counties did not have a single licensed dentist. They are all rural counties east of Richmond with relatively high percentages of African Americans: Charles City County, King and Queen County, Surry County, and Sussex County.

Dental offices rely on other professional staff to provide dental services and increase productivity. Registered dental hygienists bring the widest variety of skills to the dental practice. Dental
hygienists are state-licensed health workers who provide preventive dental services, including X-rays and teeth cleanings under the supervision of a licensed dentist. The number of licensed dental hygienists with state addresses has grown dramatically from 3,280 in 2006 to 4,081 in 2010, a 24 percent increase.\textsuperscript{25} According to the Virginia Employment Commission long-term occupational employment projections, employment of dental hygienists is projected to grow to 5,414 by 2018, a 33 percent increase from 2010.\textsuperscript{26}

The geographic pattern of dental hygienists is similar to that of dentists (see Figure 7). A few anomalies can be found in the some parts of the state. For instance, counties in the vicinity of Wytheville Community College in Wythe County and Western Community College in Roanoke, where dental hygiene associate degree programs have been established, exhibit high concentrations of dental hygienists. This pattern may persist because of a greater tendency for resident graduates of those programs to remain in the region. In addition, the concentrations of dental hygienists in some urbanized regions such as Northern Virginia and the Richmond metropolitan area are less pronounced.

Virginia has recognized regional disparities in dental workforce availability. Eighty-four areas are federally designated dental Health Professional Shortage Areas (dHPSAs), defined as a geographic area where the population has an insufficient number of dentists to serve their dental needs. Forty-five counties and cities are identified as dHPSAs (see Figure 8). According to program

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\caption{Virginia Dentists Per 100,000 Population, 2010}
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data, 15.6 percent of Virginia’s population lives in dHPSAs and 9.1 percent of the population is underserved, close to the national averages of 16.4 percent and 10.7 percent, respectively. Approximately 102 additional dentists would be needed in these Virginia dHPSAs to remove the shortage designation.

Dental Education
Virginia has one dental school, located at the Medical College of Virginia (MCV), a division of Virginia Commonwealth University (VCU). The Medical College produces the lion’s share of Virginia dentists. An estimated 67.1 percent of graduates during the period 1985-95 were state residents in 2004 (a minimum of nine years after graduation), and approximately 56.8 percent of all dental school graduates from that period still residing in Virginia are from MCV. The school expanded its class size from 80 students to 90 students seven years ago and again to 100 in the last three years. It enrolled a total of 374 pre-doctoral program students in academic year 2008-2009, and 56 percent of the 102 first-year students enrolled that year were from Virginia.

Students from Virginia attend dental school throughout the United States. The state produced about the same number of applicants on a per capita basis as the nation in 2006-2007 (3.34 applicants per person for Virginia compared to 3.35 nationwide). Enrollment rates are lower. In 2008-09, some 99 individuals from Virginia were enrolled in dental school nationally for a rate of 1.26 students per 100,000. This ranked 34th in the nation and lower than the 1.52 dental students enrolled per 100,000 residents for the United States. Enrollment rates ranged from 4.81 in Utah to 0.30 in Maine.

Virginia has six additional sites where advanced dental education is offered. Five are operated by the U.S. Department of Defense (Langley AFB, Mid-Atlantic Naval Dental Clinic, Naval Medical Center in Portsmouth) and U.S. Department of Veteran’s Affairs (V.A. Medical Center in Hampton, Department of Veteran’s Affairs Medical Center in Richmond). The University of Virginia Medical Center in Charlottesville has a general practice dental residency program of 12 months duration.

Dental hygiene programs are offered by six colleges in Virginia: The Medical College of Virginia, Old Dominion University in Norfolk, Wytheville Community College, Northern Virginia Community College, Virginia Western Community College in Roanoke, and Thomas Nelson Community College Historic Triangle Campus in Williamsburg. In addition, two community colleges offer affiliate programs in conjunction with established dental hygiene programs (Germanna Community College in cooperation with Northern Virginia Community College and Lord Fairfax in Middletown in partnership with Virginia Western Community College).

Safety Net Providers
Safety net providers offer health care services to uninsured, Medicaid, and other low-income patients. A substantial portion of the funding for these providers is derived from federal, state, and local government and charitable sources. There are at least four types of agencies or organizations that serve as safety net providers for Virginia dental care needs: community health centers, local...
health departments, free clinics, and mobile clinics. Hospital emergency rooms serve as a provider of last resort for cases requiring urgent care, including dental infections and facial injuries.

Local health departments are funded by the state and deliver medical services, school health services, child health and immunization services, environmental health inspections, and other services. They are an important source of dental care for low-income children. Some local health departments also offer limited services to low-income adults when time and resources are available. However, these services have been curtailed in the face of state budget stresses caused by the recent recession in what has become a familiar national pattern. In 2007, 68 local health departments offered both preventive and restorative services. By 2009, as the recession continued, their number had decreased to 38. The Virginia Health Department has estimated that approximately 22,000 patients received dental care services on 37,000 visits through local health department fixed or mobile clinics in FY 2010.

Community health centers, of which Federally Qualified Health Care Centers (FQHCs) are the most significant part, are the most significant component of the dental safety net. Nationwide, there were 1,080 FQHCs in 2008 of which 75% provided comprehensive dental services. They are community non-profit organizations that provide primary health, oral and mental health care services to patients regardless of their ability to pay. Fees are charged on a sliding scale based on family income levels, family size, and insurance status. Part of the funding to cover uncompensated care comes from grants under Section 330 of the federal Public Service Act. There are 25 FQHCs in Virginia, most of which provide comprehensive dental services. They account for a growing number of dental patients and visits: 33,003 patients on 77,576 visits in 2010, up from 25,063 patients and 58,675 visits in 2007.

Free clinics are non-profit organizations that provide health care at low cost or no charge to low income uninsured patients. These organizations rely heavily on care donated by volunteer health professionals, charitable monetary contributions, partnerships with other health-care organizations, such as community health clinics, as well as public assistance program funds like Medicaid/FAMIS and service fees. There are 61 free clinics in Virginia, of which 26 provide dental care. Free clinics treated 16,301 patients in 2010 on 45,178 dental visits.

The Virginia Dental Association Foundation (VDAF)/Mission of Mercy (MOM) and Remote Area Medical Foundation (RAM) host, in conjunction with other state and regional partners, free dental clinics in various locations around the state. The first clinic at the Virginia/Kentucky Fairgrounds in Wise was begun in 2000 and has been held annually ever since, growing nearly every year into what is said to be the largest regularly scheduled RAM clinic in the nation. The geographical reach of these programs has expanded considerably over the last ten years. An estimated five to seven clinics are now held each year. Among the locations where free dental clinics have been offered are at Grundy in Buchanan County, Martinsville, Roanoke, Buena Vista, Petersburg, Emporia, Middle Peninsula, Norfolk, Eastern Shore, Northern Virginia, and Orange. Since 2000, they have treated over 46,000 patients for a total value of donated dental care estimated to be $26.5 million. Even with such extraordinary volunteer efforts, only a small proportion of individuals with dental needs can be seen and the long lines and huge number of extractions performed testifies to the large gaps remaining in the dental safety net.

For uninsured patients, hospital emergency room care is the only regularly available recourse for painful oral infections and oral trauma. The services offered in emergency settings are generally restricted to prescribing antibiotics and pain-killers with referral to a dentist for care. Although state figures on utilization of hospital emergency rooms for oral/dental urgent and emergency care are not available, one national study found that dental/oral complaints account for almost 1 percent of emergency room visits, with most patients either having Medicaid or no insurance. An analysis of Utah, Vermont, and Wisconsin found that oral health diagnoses account for 1.3 to 2.7 percent of emergency department visits, with the same payment pattern. A state senate resolution (SJ 50) adopted in February 2012 asks the Joint Commission on Health Care to study the use of hospital emergency departments for dental-related diagnoses and its associated fiscal impact, but the resolution was tabled by the House Committee on Rules.

Policy Actions That Influence Utilization of Dental Care

In addition to funding programs to educate the public and increase awareness of oral health issues, Virginia’s current policy efforts have focused on strategic initiatives in four areas: funding and improved management of public dental insurance, implementing programs targeted at at-risk children, sponsoring programs to address medically underserved areas, and increasing public water supply fluoridation. Although not a
Virginia initiative per se, state agencies will also be charged with implementing provisions of the recently adopted federal Affordable Care Act that could have a considerable effect in the first three areas.

**Public Insurance**

Virginia is mandated to provide comprehensive dental coverage for children. But payment rates historically have been low, resulting in low participation by dentists. Virginia reformed its Medicaid program in 2005, implementing *Smiles for Children*, which is administered by the Virginia Department of Medical Assistance Services (DMAS). The program increased reimbursement rates for dental services by 32 percent, resulting in fees that were 62 percent of commercial fees. The reform also simplified reimbursement procedures and reduced administrative barriers, improved case management with clients to reduce missed appointments, conducted efforts with state dentists, and established the Dental Advisory Board to guide changes.44 As a result, Virginia has made huge strides in increasing child enrollment and dentist participation in Medicaid/FAMIS to improve children's oral health statewide. It uses private dentists who choose to participate in the program, as well as dentists who work in public health clinics. Since the program was begun, provider participation increased from 620 in 2005 to 1,648 in 2012 (approximately one third of professionally active dentists in the state).45 Also, utilization more than doubled from 21.8 percent of children aged 1-18 enrolled in Medicaid or CHIP in 2000 to 48.2 percent in 2010 (see Figure 9), moving from below the national average to above the national average but still lagged the leading state of Idaho at 64.2 percent. Utilization for the 3-21 year age group rose from 27 percent in 2001 to 55.6 percent in 2011.46 The Virginia program demonstrates that states can improve utilization rates among Medicaid children with a well-structured program and sufficient investment.

Virginia offers very limited dental services to its adults for two reasons. First, the state Medicaid eligibility rules for adults are fairly stringent and exclude some categories of low-income individuals who would be covered by other states. The income eligibility limit for working adult parents is the sixth lowest among the states and non-disabled childless adults are excluded from Medicaid.47 Second, Medicaid-eligible adults are generally offered only emergency services, which includes infection control and emergency extractions of teeth. The states vary on the range of services offered under Medicaid.48 In 2008, six states covered no dental services for adults while sixteen states offered only emergency services. Thirteen states offered at least one category of restorative or preventative service and sixteen offered comprehensive coverage.

**Programs for Children**

The Virginia Department of Health operates several oral health programs for at-risk children. These programs include an early childhood fluoride treatment program—“Bright Smiles for Babies”—designed to reach children at an early age.

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**Figure 9: Medicaid Utilization for Children 1 to 18, 2000 - 2010**

![Figure 9: Medicaid Utilization for Children 1 to 18, 2000 - 2010](http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Early-Periodic-Screening-Diagnosis-and-Treatment.html). Percentages calculated by dividing the number of children ages 1-18 receiving any dental service by the total enrollment of ages 1-18.
age, a school-based sealant program, a school-based fluoride mouth rinse program, and pilot programs in high poverty counties that allow dental hygienists an expanded scope of operation.

The school-based programs have been enhanced in some regions by allowing dental hygienists working for the Virginia Department of Health to provide additional preventive services without the direct supervision of a dentist. To promote dental sealants for underserved children, the Virginia Department of Health set up a pilot program that allowed dental hygienists to work under remote supervision in schools in Southside and Southwest Virginia to provide dental sealants. New legislation recently authorized remote supervision in limited settings throughout the state.

Current state planning efforts are directed toward expanding fluoride varnish, sealant, and dental services for children with special needs. "Bright Smiles for Babies" provides children under the age of three with two fluoride varnishes per year. Statewide, the fluoride varnish program has grown from a network of 24 Medicaid providers and 516 claims in FY 2006 to 118 providers and 6,262 claims in FY 2011 (see Figure 10). Virginia Department of Health (VDH) spending for several other oral health areas has been decreased over the past decade because of budgetary constraints. The Virginia Department of Health had previously operated a weekly topical fluoride mouth rinse program for communities without water fluoridation that treated approximately 50,000 children each year until the end of the 2010 school year when state funding was eliminated. The number of dental sealants applied in FY 2011 was less than half the amount in FY 2003. Also, the number of children served by local health department public health dental staff has decreased markedly from 25,961 in FY 2003 to 14,714 in FY 2011.

While these service level decreases might seem to imply lower child dental care access, the reality is quite the opposite. Private service providers have more than filled the void by increased participation in the Medicaid program. The number of Virginians under the age of 20 receiving dental services grew by 30,000 in FY 2011 alone for a total of 347,145 children, a figure that dwarfs the Health Department service numbers. These improvements have been made possible by substantial funding increases. State and federal funds for Medicaid dental services dramatically increased between FY 2002 and FY 2008 before state funds began to flatten out (see Figure 11). The principal source of increase in the last couple of years has been federal funds from the American Revitalization and Recovery Act of 2009, which ran out in June 2011. A big question is how long current efforts can be sustained without replacing those funds.

Medically Underserved Areas
Virginia benefits from several federal government programs administered by the Health Resources and Services Administration such as the National Health Service Corp (NHSC), Rural Clinic Program, and other Title VII programs to place dentists in underserved areas. In addition, the Virginia Department of Health has operated its own program that offers a scholarship and loan repayments for dental students who practice in underserved areas and agree to treat low-income and Medicaid patients. Between 1986 and 2008, VDH administered 63 scholarships. Twenty-three dentists completed practice in underserved areas and stayed; 9 completed practice and stayed, but

Figure 10: Virginia Childhood Oral Health Service Measures, FY 2003 to FY 2011

Source: Virginia Performs; Virginia Department of Medical Assistance Services.
the areas involved are no longer underserved; 10 completed practice, but then moved to non-underserved areas; and 21 did not fulfill their obligation. State funding for these educational assistance programs was eliminated in FY 2009, and they now rely on periodic infusions of federal aid to continue.

Fluoridation
Fluoridation of drinking water has been hailed by the U.S. Centers for Disease Control as "one of the ten great public health achievements of the 20th century." Studies show that it has reduced dental cavities and tooth disease by from 11 to 40 percent. Some studies also suggest that demand for dental treatment such as costly restorative procedures is reduced.

Virginia has the sixth highest rate of fluoridation of public water systems in the nation. In 2010, more than 95 percent of the population on public water supply systems received fluoridated water, compared to 74 percent nationwide. This is a marked improvement for Virginia from earlier decades (see Figure 12). Because about 18 percent of Virginia residents rely on well water, the percentage of the total population receiving fluoridated water is only 76.5 percent. These residents are located primarily in rural areas, which helps explain the large geographical disparities in water fluoridation (see Figure 13).

Virginia has already exceeded the national objective of the federal government's Healthy People 2020 program to provide fluoridated water for about 80 percent of the population on public water supply systems. Therefore, the focus has shifted from expansion to maintenance. Most of Virginia's fluoridation infrastructure was installed during the 1970s and aging infrastructure will require reinvestment.

The Affordable Care Act's Impact on Dental Health
The Affordable Care Act, recently upheld by the Supreme Court but still politically controversial, was created to improve health care insurance coverage and help contain rising health care costs. The act has a number of provisions that would affect dental insurance, the dental safety net, numbers of dental health professionals, and school-based dental service availability. The most significant portion of the legislation expands pediatric oral health care insurance by mandating that oral health plans for children be included as part of family health care insurance plans offered by state health insurance exchanges to be established.

*Virginia has the sixth highest rate of fluoridation of public water systems in the nation.*

![Figure 11: Medicaid Expenditures for Dental Services, Virginia, FY 2002 to FY 2010](image-url)
These plans must also offer preventive services without an out-of-pocket charge. Combined with existing Medicaid and CHIP programs, the Affordable Care Act establishes near-universal dental coverage for children. It also authorizes funding for an expansion in the system of Federally Qualified Health Care Centers (FQHC) and grants for school-based health centers that may include oral health services. In addition, the act authorizes expansion of the school-based sealant program to all 50 states. The legislation provides additional funding for scholarship and loan repayment programs.
for dental students and establishes a demonstration program to train or employ alternative dental health providers.

**Measuring Virginia Policy against an Inventory of Best Practices**

State and local agencies as well as state public health and oral health advocacy groups have developed strategic plans that address improving oral health within the commonwealth. State agency plans invariably link their goals and benchmarks to the U.S. Department of Health and Human Services (HHS) *Healthy People* plan, an apparent prerequisite to qualify for various kinds of federal program funding support.62

Virginia also has an oral health strategic plan, although it is unclear how successful such planning has been in influencing the policy agenda. The Virginia plan, which was introduced in 2004, went further in reach and specificity of objectives outlined in the *Healthy People 2010* plan. For example, the Virginia plan cites the goal of improving service in “areas of need” by funding scholarship and loan programs, improving reimbursement rates for private providers, and increasing funding for dental clinics. It calls for increased funding for dental schools. It broaches the controversial topic of dental health profession regulation, including the need to consider new categories of providers, expanded scopes of practice, and license transferability from other states. It advocates increased funding for children's programs, increased reimbursement for Medicaid dental care, streamlined administrative processes and improved case management to improve child access, and improved efforts to combat the problem of unhealthy food and drinks available in schools. It also supports expanding the dental safety net and increasing Medicaid coverage for adults.

With federal funding, the Virginia Oral Health Coalition, a recently created advocacy organization composed of public health representatives and non-profit groups, is creating an update of the 2004 Virginia plan.63 The coalition has identified 19 objectives, some of which follow the 2004 plan. But it also includes new recommendations such as encouraging the establishment of permanent relationships between low-income patients and providers (also known as “dental homes”) and making greater use of information technology and telecommunications in dental care (also known as “teledentistry”). It also calls for greater collaboration between medical and dental care providers in preventing dental problems.

One can gain a better understanding of how well the state is performing on oral health objectives from two online reporting systems. The National Oral Health Surveillance System (NOHSS) and the Synopses of State and Territorial Dental Public Health Programs, maintained by the Centers for Disease Control and Prevention (CDC) and the Association of State and Territorial Dental Directors (ASTDD) provide comparative state data on oral health inputs, outputs and outcomes.

New research, the experiences of other states, and oral health policy watchdog group evaluations can also inform public policy in this area. In the last year, the Institute of Medicine/National Academies of Science has published two blueprints for oral health policy informed by current dental policy research.64 The Association of State and Territorial Dental Directors (ASTDD) maintains an up-to-date inventory of best practices drawn from its membership based on their experiences. The Pew Study on the States Children’s Dental Campaign monitors and evaluates programming related to child oral health while Oral Health America rates oral health programming for all age groups.


**Policy Implications**

While large unfinished policy agendas and mediocre grades can be a great motivator to do more, policy-making entails allocating scarce resources that have alternative uses. Doing so is fraught with difficulties when results are imperfectly measured, uncertainty exists about the amount of resources dedicated to oral health, and comparative cost-effectiveness studies are not available. There are several policy areas under discussion that are relatively promising in Virginia and others that are considerably less so. These broad areas, discussed below, include dental workforce education, workforce distribution, children's programs, the dental safety net, and the use of alternative providers.

“[Virginia] falls short in the reach of its child sealant program in at-risk schools, the scope of dental hygienist practice allowed for school-based programs, Medicaid reimbursement rates, and authorization of alternative dental care providers.”
**Dental Workforce Education**

State and local policymakers have discussed the possibility of establishing a second dental school in Virginia to help alleviate regional disparities. At least two possible locations have been mentioned: one in the Roanoke-Blacksburg region that would be affiliated with the Edward Via College of Osteopathic Medicine and another at the University of Virginia at Wise campus in Norton. A regional dental school could bring about a sizeable improvement in the availability of dentists in a region.\(^66\) A clinic as part of the dental school would be the primary means for improving dental care among underserved residents. The retention of graduate dentists would play a much more modest role. However, establishing a dental school is likely to encounter significant obstacles, including the high cost of setting up the necessary academic infrastructure and physical plant, recruiting and retaining faculty, and operating a school-based clinic outside a major metropolitan area. Current dental school models located in less densely populated areas, such as East Carolina University, rely on a network of regional public dental clinics to serve as training sites for students and residents and to reinforce their missions of expanding rural and public dental care practice.

Less expensive options for obtaining the same results as a new dental school include encouraging dental professionals to practice in underserved areas. Education pipelines starting with pre-professional preparation in high school and college are a promising approach. Because individuals from rural and disadvantaged areas are more likely than some to choose those areas to practice, efforts could be made to facilitate their preparation and entry into dental school. A dental pipeline through a joint college-dental school program or college preparatory program could shorten the length and tuition of undergraduate and dental education. Such a program would require state or federal support.

**Workforce Distribution**

Financial incentives to practice in underserved areas can potentially expand the pool of dental professionals there.\(^67\) The effectiveness of such programs in meeting these goals may be sensitive to program design characteristics, including the method of selecting and preparing participants, the magnitude and timing of the benefits, and the severity of penalties for not complying with (or “buying out” of) the service requirements. Typically, such incentives take the form of scholarships, loans, and direct financial incentives with requirements that awardees practice in an underserved area or serve a threshold of underserved or disadvantaged patients (e.g., Medicaid patients) for a period of time. If successful, such programs provide benefits that are twofold. First, disadvantaged patients unlikely to otherwise obtain care receive it. Second, insured and out-of-pocket-paying patients may save on travel or waiting times, which may enhance the likelihood of seeking care, number of visits, and mix of services. Programs vary in the amount of importance attached to serving disadvantaged patients versus locating in underserved areas. Thus, it is difficult to estimate the relative magnitude of benefits that accrue to serving these different populations or whether they exceed program costs.

While politically attractive, the actual evidence on the effectiveness of such programs is surprisingly limited and the evidence that is available often unfavorable. Results indicate that the proportion of graduates who fulfill their obligation to work in underserved areas, the rate of long-term retention of practitioners in underserved areas, and the amount of importance of the incentive in location choice are actually low. Most financial incentive programs experience high attrition rates from the start of training through the period of service obligation, particularly student scholarship and loan programs.\(^68\) Some research suggests that approximately half of recipients who obtain financial assistance continue to either serve in an underserved region or work with underserved populations.\(^59\) But, they are unlikely to remain at the site of initial practice.\(^70\) Moreover, it is not clear that the incentive programs assist rural retention or ultimately alter the locational choices of graduates.\(^71\) For instance, a study of physicians who served in the National Health Services Corp indicates that graduates who were already predisposed to working in underserved regions because of their backgrounds self-selected themselves into the NHSC program.\(^72\)

Another option considered by states to deal with underserved areas is to relax standards for foreign dentist licensure and allow them to be recruited through the H-1B visa program. A small number of international dental school graduates are licensed to practice in the United States after completing a supplemental education program (2-3 years in duration) at an accredited U.S. institution.\(^73\) Wisconsin allows foreign trained dentists to complete a one-year dentistry residency program in order to qualify for sitting for national and regional licensure examinations. The limited evidence available on the locational patterns of international dentists and other medical professionals such as physicians suggests they have low retention rates in underserved areas and tend to
of preventing cavities for permanent teeth. In order to continue progress, at some point, an expansion of this approach may be needed. One promising model is a school-based dental program at high-need schools that provides on-site screening and preventive care by dental hygienists and support staff with on-site or off-site restorative care by private and public dentists. There are such clinics in operation in Virginia, including sites in Accomack and Caroline counties. One study shows that a school-based program is financially feasible if Medicaid fees are 60.5 percent of mean national fees, which is about where Virginia is now. Moreover, the unit costs of providing child dental care can be cut nearly in half, meaning that more children could obtain care or program funds could be reduced or directed elsewhere.

Dental Safety Net
Unlike children, adults typically do not have public dental insurance available, making them even less likely to seek dental care. Examining adults and children in 2000, one study found that out of 82 million low-income, underserved people only 27.8 percent visited a dentist. The primary sources of care were dental clinics in community health centers, hospitals, public schools and dental schools, which combined have a capacity to care for 7 to 8 million people annually. The study estimated that the safety net could be expanded by 10 million people annually by increasing the number of community clinics and their efficiency, requiring one-year of residency training for students in dental schools, and requiring senior dental students and residents to work 60 days in community clinics. Even with this increase, there would still be a significant shortfall in available low-income care.

There are opportunities to improve the dental safety net in Virginia. The Virginia Health Care Foundation reports that there are 62 Virginia localities that have no safety net dental clinic. Plugging the remaining geographical gaps, particularly at a time when increased federal funds may be available for FQHC dental clinic expansion as part of the Affordable Care Act, would seem to be an appealing option. FQHCs are attractive because the federal government will bear much of the expense. Efforts could be made to increase the number of FQHC sites that offer a full array of dental services. However, funding remains subject to changes in federal policy. While free clinics and charity care, such as the Virginia Dental Association’s Missions of Mercy (MoM), currently provide an impressive amount of care to disadvantaged individuals, they cannot be expected to solve the access problem and may discourage other avenues.
of providing care to the needy. These programs rely on a finite and exhaustible supply of volunteer services. They cannot provide regular preventive services, and patient waiting lists and lines are often long.

**Alternative Providers of Service**

There is considerable evidence that improvements in oral health in underserved populations could be achieved by expanding the services offered by dental professionals other than dentists. Expanding the functions that dental hygienists can perform and relaxing the requirements for supervision by dentists would increase the quantity of services actually delivered to underserved residents and would lower the price of receiving basic care.82 In particular, allowing hygienists to offer fluoride varnish and routine cleaning without supervision by a dentist has the potential to generate significant health improvements at low cost. The resulting increase in visits by those previously not receiving care has a very important side benefit. The hygienist providing the service would be in a position to identify patients in need of additional care and to refer the patient to a dentist for treatment of the condition. Many of the people with these undiagnosed conditions would have ended up waiting until the condition had worsened and would require extraction or even emergency room care. The incidental savings from wider availability of routine care may be large.

Alternative providers of services could also be used to lower cost and expand the distribution of services available. For example, the dental health aide therapist is a provider that performs cleanings, dental restorations and uncomplicated extractions under varying levels of remote dental supervision. Dental therapists are used in more than 50 countries worldwide. Within the United States, only Minnesota and some remote parts of Alaska license dental therapists, but several other states are considering them. A recent study of the safety and effectiveness of dental therapists in Alaska found that dental therapists exercised good judgment, provided appropriate care, and received high patient satisfaction ratings.83 Another study found that dental therapists would allow more patients to be served at lower cost, while maintaining or improving the financial bottom line of dental practices.84 There are also proposals to create additional oral health providers, such as the advanced dental hygiene practitioner (a new level dental hygienist with two years of graduate education that would permit them to perform some restorations and simple extractions) and community dental health coordinator.85 The ultimate effect of introducing these new practitioners remains to be seen.

Expanding the use of primary care physicians in applying dental sealants, as well as providing education, is another way to reach more children. Although Medicaid already reimburses physicians for services such as fluoride varnish, expanding the range of prophylactic services that can be administered in the offices of primary care physicians could increase services to children, as children are more likely to visit physicians than to visit dentists for checkups under public insurance programs.

The expansion of alternative providers may also improve the viability of alternative service delivery models. For example, offering a limited number of affordable and transparently priced dental services in a retail setting such as a retail outlet or mall, have gained popularity and are a promising avenue for expanding preventive care access.86 Improved access to the underserved depends on how this model evolves. But, ultimately, its viability may depend on permitting mid-level professionals to practice independently.

Any changes would be likely to meet opposition from providers, including both dentists and dental hygienists. However, as the recent adoption of the Dental Assistant II certification by the General Assembly in 2011 shows, it is possible to expand certifications and also expand effective care, and increase the productivity of dental offices. Moreover, as one academic dentist points out, if providers do “not address the access problem in Virginia, and do it through new workforce models that promote care for under-served Virginians, someone else surely will.”

**A Practical Roadmap to Better Policy Effectiveness**

Although some political leaders, public health officials and advocacy groups have sometimes used stark language such as “crisis” or “silent epidemic” to describe the contemporary oral health landscape, the reality is that the nation has made slow but steady progress in improving dental and oral health and increasing access to care over the last several decades. There are various explanations for this. One is that more citizens are able to afford care as incomes have risen and private insurance has increased. More employers are offering dental benefits than ever before. Another reason is that younger generations of Americans have grown up with fluoridation and modern dental technology, are often better educated, and are more likely to place emphasis on personal appearance and a healthy lifestyle than some earlier generations. Still another reason is that prudent, carefully targeted public policies have expanded access for underserved populations. The goal that
the newest generation will have better oral health than their parents seems within reach and bodes well for the future.

Virginia performs better on most measures of oral health than the nation at large. In part, this reflects its relatively high average income level, which affects the ability of residents to afford dental care and the state’s capacity to attract providers of these services. However, the improvements have not been evenly distributed, with tooth decay continuing to be a major problem among low-income, rural, and minority populations.

The state has made some notable progress in improving care for these populations, and in some public policy areas such as low-income children’s access and utilization, the state compares very favorably with best practices. However, the state draws only an average “C” rating from oral health monitoring organizations. If Virginia measures its success by continued progress towards improving oral health for all its citizens, regardless of race, income, or where they live, new and more creative policy initiatives will be needed in the near future.

Among such measures and proposals being discussed today, many are sensitive to the political debates over the Affordable Care Act and the use of hygienists and other health professionals to make dental care more widely available to all Virginians.

Correction:
The text on page 7, column 2, second paragraph has been modified to include the dental hygiene programs offered by Old Dominion University which were inadvertently omitted in the original article.

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Endnotes
2 There is a correlation with general health, nutrition, digestion, speech, social mobility, employability, self-image and esteem, school absences, and quality of life. Both bacteria and inflammation resulting from oral disease may also have a negative effect on other chronic diseases, such as cardiovascular disease, stroke, adverse pregnancy outcomes, respiratory infections, diabetes, and osteoporosis. U.S. Department of Health and Human Services. Healthy People 2010: Objectives for Improving Health. (Washington, DC: U.S. Government Printing Office, 2000), pp. 213-215.
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18

Coverage: Who Has It and How Does It Influence Dental Visits and


through 2022, "Brown, "The Impact of New Dental Schools on the Dental Workforce

North America 391. 56.1 percent. Tomar and Reeves, "Changes in the Oral Health of U.S.

ies increased for non-Hispanic black children from 49.4 percent to

1988-1994 to 23.7 percent in 1999-2004. Furthermore, dental car

15  For example, recent data from National Health and Nutrition

Education Reconciliation Act of 2010 (Public law 111-152).

the subsequently passed health care portions of the Health Care and

Education Reconciliation Act of 2010 (Public law 111-152).

11  Scott L. Tomar and Anne F. Reeves, "Changes in the Oral

Health Infrastructure since the Release of the Healthy People 2010


J. Caplan, and J. A. Weintraub, "A Quarter Century of Changes in Oral Health

in the United States," Journal of Dental Education 59, 1: 19-57


13  R. A. Dye, S. Tan, V. Smith, B. G. Lewis, L. K. Barker, G.

Thornton-Evans, P. Eke P. E. D. Beltrán-Aguilár, A. M. Horowitz, and


Caplan, and Weintraub, "A Quarter Century of Changes in Oral Health

in the United States," p. 19; L. Jackson Brown, "Dental Services Among

Elderly Americans: Utilization, Expenditures, and Their Determinants"

in J. B. Lamster, M. E. Northridge (eds.), Improving Oral Health for the


14  This information is obtained from the Centers for Disease

Prevention and Control National Oral Health Surveillance System

(NOHSS) http://www.cdc.gov/nohss/. Sampling periods, survey

response rates, and adjustments made for non-response can vary by

state.

15  For example, recent data from National Health and Nutrition

Examination Survey (NHANES) reveal that the dental caries experi-

ence nationally for children 2 to 4 years of age grew from 18.5 percent

in 1988-1994 to 23.7 percent in 1999-2004. Furthermore, dental car-

ies increased for non-Hispanic black children from 49.4 percent to

56.1 percent. Tomar and Reeves, "Changes in the Oral Health of U.S.

Children and Adolescents and Dental Public Health Infrastructure since the Release of the Healthy People 2010 Objectives," pp. 389 and

391.


17  David Guthrie, David, Richard W. Valachovic and L. Jackson

Brown, "The Impact of New Dental Schools on the Dental Workforce


18  Virginia Department of Health, Parent Questionnaire.

19  R. J. Manski and E. Brown, Dental Use, Expenses, Private Dental

Coverage, and Changes, 1996 and 2004. MEPS Chartbook No. 17


20  R. J. Manski, M. D. Macek, and J. F. Moeller. "Private Dental

Coverage: Who Has It and How Does It Influence Dental Visits and


21  Wall Street Journal, "The Health PAC to Watch? Dentists," (June


577478723769027162.html

22 Kaiser Family Foundation, 2009 statehealthfacts.org (Based on

American Dental Association Dental Data for 2009, Special Data

Request); Health Resources and Services Administration, Area

Resource File 2009-2010. Bureau of Health Professions, Office of

Workforce Policy and Performance.

23 Harold S. Goodman and Robert I. Weyant, "Dental Health


24 Dentists and dental hygienists were assigned to localities on the

basis of license mailing addresses obtained from the Virginia Board of

Dentistry. (Oral-maxillofacial surgeons and teaching faculty were

excluded for dentists.) The data are not an exact count of practicing

dentists by location, since not all licensed dentists and dental hygien-

ists are active and some practice out-of-state or work for the federal

government. In addition, some Virginia licensed dentists and dental

hygienists with out-of-state license addresses may practice in Virginia,

and some dentists work at multiple sites scattered among different

jurisdictions. Maps illustrate smaller independent cities combined

with their surrounding county using the Bureau of Economic Analysis

classification scheme. The legend class boundaries are determined

using the Jenks natural breaks method that reduces the variance within

classes and maximizes the variance between classes.

25 Virginia Department of Health, Report on Services Provided by

VHDI Dental Hygienists Pursuant to a Practice Protocol in Lenowisco,

Cumberland Plateau and Southside Health Districts (2006).

26 Virginia Employment Commission, Occupational and


asPCAT-HST_EMP_WAGE_OCC

27 U.S. Department of Health and Human Services, Health

Resources and Services Administration, State Population and Health

Professional Shortage Areas Designation Population Statistics and

Health Professional Shortage Area (HPSA) NHSC Fulfillment of Dental

Care HIPSA Needs Summary (A data warehouse.) http://datawarehouse.

hrsa.gov/quickaccessreports.aspx

28 Hsuan L. Lin, Michael L. Rowland, and Henry W. Fields, "In-state

Graduate Retention for U.S. Dental Schools," Journal of Dental


29 Lauren E. Mentasi and Edward A. Thibeudeau, "Dental School

Applicants by State Compared to Population and Dentist Workforce


Census Bureau (2010).

31 American Dental Association, 2008-09 Survey of Advanced Dental Education.

32 Institute of Medicine and National Research Council, Improving


nps/modelapid=StateData&StateID=VA&Year=2009


astdd.org/state-activities-descriptive-summaries?tid=106

35 Children’s Dental Health Project, A Roadmap for Implementation,


36 Institute of Medicine and National Research Council, Advancing


37 Health Resources and Services Administration. Health Center


38 Virginia Association of Free Clinics, Membership Renewal and


39 Stan Brock and Amanda Wilson, “Remote Area Medical: Pioneers of No-cost Health Care,” in Richard Allen Williams, ed., Healthcare


40 Virginia Dental Association Foundation,. http://vdaf.org/

Mom-Details/


43 Virginia General Assembly, Legislative Information System, http://legl.state.va.us/cgi-bin/legp506.exe?121+cab+SC1021350050+UCSF1


51 Virginia Performs Website. Department of Health Service Area Measure, Number of Children Participating in the School Fluoride Rinse Program. http://vaperforms.virginia.gov/agencylevel/src/displaymsr.cfm?measured=60143015.001.001


53 Virginia Performs Website. Department of Health Service Area Measure, Number of Low Income Children Receiving Dental Services Provided by Local Health Department Public Health Dental Staff. http://vaperforms.virginia.gov/agencylevel/src/displaymsr.cfm?measured=60144002.002.002

54 Virginia Department of Medical Assistance Services (DMAS), Annual Report of Smiles for Children


59 There are some areas with naturally high well water fluoridation levels. These areas are not included in the fluoridation percentages because of a lack of current information on the population affected.


62 The Healthy People strategic planning process began in 1980. Since 2000, the plan has included explicit oral health goals. Follow-up studies of the previous decade’s plan, Healthy People 2010, show that progress was made toward most benchmarks but none of the milestones were achieved and for the under 5 age group, there was much regression. The Healthy People 2020 initiative builds on the 2010 plan, carrying over 15 of the goals, adding two more, and revising milestones upward. The 17 oral health objectives in Healthy People 2020 span improving oral health outcomes for children (reducing dental caries experience, untreated decay) and adults (reducing untreated decay, tooth loss, periodontitis, oral and pharyngeal cancers), increasing utilization of dental care and preventative services, and dedicating additional resources toward particular programs such as school-based dental clinics, the dental safety net, public water supply fluoridation, and dental sealants/topical fluoride programs for children.


66 Warchek, Rephann, and Shobe, Oral Health and the Dental Care Workforce in Southwest Virginia.


68 Ibid., p. 11.


75 Virginia Performs Website. Department of Medical Assistance Services, Percentage of enrolled children who utilize dental services. http://vaperforms.virginia.gov/agencylevel/src/displaymsr.cfm?measured=60244602.004.001

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