POLICY BRIEF

Policy Options for Reducing Early Childhood Tooth Decay

Lessons from a New York State Simulation Model

children's dental health project

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Introduction

Despite being largely preventable, tooth decay remains the most prevalent chronic health condition among U.S. children and adolescents.[1] Nearly half of all children entering kindergarten have had at least one cavity and three-quarters have untreated cavities.[2] While prevalence has significantly decreased in recent years among most children, early childhood caries (ECC)—tooth decay in children from birth through age 5—is becoming more frequent among those ages 2-5.[3] The increase in tooth decay is especially pronounced among children living in low-income families, which indicates that the current oral health care system is not adequately addressing the needs of children with the highest risk for poor oral health.

In addition to proven public health practices such as community water fluoridation, opportunities exist in the use of risk assessment tools, improved clinical guidelines, and innovative care models to prevent and manage ECC by providing early and appropriate care to children based on their unique levels of risk for disease. Unfortunately, dental benefit designs and resulting dental practice often fail to reflect the clinical understanding that ECC prevention and management requires individually-tailored care plans that may require more frequent treatment than the traditional one-size-fits-all, six-month prevention "recall visit." State Medicaid programs for children may constrain preventive care to such six-month visits despite Medicaid's benefit structure which is designed to ensure "that individual children get the health care they need when they need it" in the appropriate time and setting.[4]

With enrollment increases in both private and public dental coverage as a result of the Affordable Care Act (ACA), state and federal policy makers and insurance programs would benefit from investing in prevention and disease management to reduce disease and, subsequently, cost.

New research provides support for early intervention and individualized care both for children and pregnant women. It suggests promising returns from social strategies like motivational interviewing and from encouraging basic oral health behaviors such as increased tooth brushing with fluoridated toothpaste. In partnership with the Centers for Disease Control and Prevention (CDC), the Health Foundation for Western and Central New York, and the New York State Bureau of Dental Health, the Children's Dental Health Project engaged researchers in developing a simulation using system dynamics modeling (SDM) to examine various strategies to reduce and suppress ECC among New York State's Medicaid population.* The SDM projected the impact of these

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strategies in reducing tooth decay and saving money over a 10-year period.

The New York State model builds on a prior ECC SDM analysis for all young children in Colorado[5] by focusing only on young children who are Medicaid beneficiaries. The model's inputs are based on the best available evidence—from substantive studies reported in the peer-reviewed literature to expert opinion. Its outputs are both fillings avoided and net Medicaid savings (including intervention costs).

CDHP's analysis suggests that children, families, public and private payers, plans, taxpayers and state insurance marketplaces would all benefit from plan designs that incentivize pediatric oral health care which meets the expectations of both "personalized health care"—providing the right intervention, at the right time, to the right patient—and the "triple aim"—improving health outcomes at lower costs with improved population health.

This brief:

- explores findings of the New York State ECC system dynamics model as they relate to cost-effective care delivery and reducing risks of disease; and
- articulates policy options to better align the oral health care delivery system with established caries management science.

Opportunities

Cost-Effective Care Delivery

The simulation model findings make clear that state Medicaid programs should craft dental benefits in ways that achieve better oral health outcomes among enrolled children while potentially reducing per-capita costs.

Despite statutory language specifically aimed at ensuring that oral health care is tailored to each child's individual needs, at the state level, both Medicaid and CHIP programs provide dental services according to traditional care methodologies that fail to appropriately emphasize prevention and disease management. CHIP dental benefits mirror state-selected private dental insurance benchmarks and often include service and dollar limits that restrict access to evidence-based care for patients at high risk for disease.[6] State Medicaid programs are required to identify a periodicity schedule that outlines which services should be provided to pediatric beneficiaries and at what intervals.[7]

However, a number of states utilize periodicity schedules that do not align with updated professional guidelines, limiting the frequency of dental visits and preventive services like fluoride varnish to six-month intervals, despite a child's level of risk.[8] While periodicity schedules are not necessarily meant to serve as a ceiling for treatment, they may inadvertently serve as implied limits for insurers and providers despite such limits being at odds with current research.

The ECC simulation model conducted for New York State suggests that the application of fluoride varnish for children ages six months to 5 years could reduce the prevalence of cavities by more than 30 percent. Fluoride varnish is most cost-effective when targeted to the highest-risk children ages 2-5 years, generating a return of 65 cents for every dollar spent.[9]

The model also underscores the benefits of risk-based care protocols such as Caries Management by Risk Assessment (CAMBRA).[10] This approach shows that aggressive preventive treatment of the earliest stages of tooth decay (such as white spots on teeth), along with intensive follow-up care for children who have already had cavities, can reduce the prevalence

of cavities by 27 percent and return 76 to 88 cents for every dollar spent.

The simulation model's findings come at a time of growing momentum for risk-based treatment, including the application of fluoride varnish. Clinical guidelines developed by the American Academy of Pediatric Dentistry recommend not only a caries risk assessment be utilized for young children, but also note that children at high risk for tooth decay should receive topical fluoride treatments more frequently than twice a year.[11] In addition, the Dental Quality Alliance, managed by the American Dental Association (ADA), last year released a set of pediatric oral health quality measures that includes topical fluoride intensity according to risk level. While these measures have yet to be adopted by state Medicaid programs, states such as Iowa and Texas already incentivize caries risk assessment protocols that allow for care to be tailored for individual patients. Supporting risk-based care, the ADA recently established three treatment codes allowing public and private insurers to reimburse for a caries risk assessment. This is a major step toward incentivizing providers to treat patients according to their risk level for tooth decay.[12]

In addition to expanding dental coverage, the ACA promotes proven prevention strategies. Among the services that must now be covered at no cost by all health plans are oral health risk assessments by a pediatrician and the application of fluoride varnish for children up to age 5.[13] This change better aligns federal policy with recent professional recommendations.[14]

The ACA also provides state Medicaid programs with the option of receiving a 1 percent increase in federal matching funds for states that provide all ACA preventive services at no cost to beneficiaries.[15] Only 10 states have taken up this option as of September 2014.[16]

Policy Options

State policies should align with the evidence that providing care according to risk for disease can produce a greater return on investment and significantly improve the oral health of the Medicaid population. States should seize policy opportunities to improve the delivery of dental benefits by:

- Developing and adopting a dental periodicity schedule that requires a risk assessment for caries—the disease that causes tooth decay—and treatment plans based on a child's level or risk for disease.
- Submitting a state plan amendment to take advantage of the 1 percent increase in federal matching funds and provide ACA preventive services at no cost to Medicaid beneficiaries.
- Encouraging and incentivizing the use of oral health risk assessments and fluoride varnish by pediatricians.

Reducing Risk of Disease

Mothers and caretakers are the typical source of infants' acquisition of *Streptococcus mutans* (S. mutans), one of the primary bacteria that initiate tooth decay.[17] The risk of transmitting such decay-causing bacteria from mother to child can be significantly reduced by the mother chewing Xylitol gum to decrease bacterial concentrations in her saliva.[18] The New York simulation model suggests that the use of Xylitol gum by mothers and caretakers may reduce cavity prevalence in children by 34% over a 10-year period. Targeting mothers of children most likely to be at risk for dental caries shows the highest rate of return for Xylitol interventions in the Medicaid program—$1.76 for every dollar spent—and it's one of the most cost-effective interventions assessed in this study.

Strategies to change personal behavior in order to achieve oral health are among the most promising investments examined by the simulation model in terms of overall cost savings. Motivational interviewing (MI) is an engagement strategy that encourages parents to adopt salutary health practices at home by linking these practices to personal values and situations. If parents were engaged through MI interventions on oral health before their child reaches the age of 2 years, Medicaid programs could anticipate up to $2.02 in annual savings for every dollar spent. Consistently brushing young children's teeth with recommended amounts of fluoride toothpaste show an even greater return on investment for Medicaid programs, saving as much as $3.21 for every dollar spent. As with fluoride varnish interventions, targeting high-risk children increases cost-effectiveness. Under a new option established by preventive services regulations allowable under the ACA, states may now engage non-traditional providers, such as community health workers, health educators, social workers, community dental health coordinators, and behavioral dieticians in delivering delegated preventive services. [19]

Community water fluoridation (CWF) is widely recognized as one of the most successful public health interventions of the last century.[20] Yet roughly one in four Americans served by community water systems does not benefit from fluoridation.[21] There are eight states in which most people served by community water systems receive drinking water that lacks sufficient fluoride to prevent decay.[22] Further, state-level data can mask inequities. For example, in New York State 72 percent of residents are on fluoridated systems, but outside of New York City, less than half do not receive fluoridated water.[23] As expected, the simulation model showed enormous returns on investment for Medicaid programs from CWF.

In communities where all children ages 0-5 have access to fluoridated water, Medicaid stands to save more than $6 for every dollar spent on CWF. Nonetheless, despite nearly 70 years of safe and well-researched usage, there are efforts in numerous communities to eliminate CWF.[24] The model projects that ending New York City's fluoridation would significantly increase the prevalence of tooth decay among young children, increasing costs to the Medicaid program by nearly $56 million over 10 years.

Noting the overwhelming benefits of CWF for the Medicaid population, oral health policy makers and advocates have called for allowing Medicaid administrative dollars to be used to support CWF efforts, which could maintain or replace aging equipment and provide additional training for water treatment personnel.[25]

Policy Options

State Medicaid programs should pursue public health interventions with potential for reducing children's ECC risk and achieving significant cost savings to Medicaid programs by:

- Exploring opportunities to invest in fluoride toothbrushing programs through early childhood education programs, Head Start, and WIC clinics.
- Including coverage of Xylitol gum in adult and pregnancy-related Medicaid benefits.
- Pursuing regulatory opportunities to provide oral health-specific motivational interviewing through non-traditional providers such as community health workers, dieticians, and home visiting programs.
- Asking the Centers for Medicare & Medicaid Services to allow the use of Medicaid administrative dollars to support investment in community water fluoridation efforts.

Conclusion

The findings of the New York State ECC simulation model reinforce the mounting evidence for an oral health care delivery system that focuses care on an individual child's level of risk for disease and identifies a number of complementary approaches for crafting dental benefits in a more cost-effective manner. In combination with proven and emerging public health interventions like community water fluoridation and motivational interviewing, a risk-based approach to oral health care stands to greatly benefit public insurance programs like Medicaid and CHIP; private medical and dental insurers; and—most of all—the children and families they serve.

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