National Oral Health Policy Center

TRENDNOTES

Better Health at Lower Costs:
Policy Options for Managing Childhood Tooth Decay

October 2009

Inside this TrendNote...

Trend:

- Tooth decay is the #1 chronic condition of childhood and is on the rise among young children for the first time in 40 years.
- Cavities are the outcome of an infectious and transmissible disease called dental caries that is preventable early in life and can be manageable without expensive interventions.
- Children who experience chronic tooth decay and related pain and infection can suffer from inadequate growth and development, speech problems, lost school days, poor self-esteem, unhealthy adult teeth and high costs for dental treatment throughout life.
- Most children experience little risk for dental caries and few cavities; however, low-income and minority children experience the highest rates of dental caries and the lowest rates of dental care.
- Dental expenditures for children reflect high costs for two sub-populations: 1. a small group of children who need extensive care for the most severe consequences of dental caries; and 2. a large number of children who receive regular preventive care despite being at low risk for developing cavities.

Policy Solution:

- Support community-wide, evidence-based policies that promote children's oral health and prevent dental caries while targeting intensive intervention to those children at highest risk for the disease.

Please read on for more background information and specific policy options…

TRENDNOTES About TrendNotes

TrendNotes, published by The National Oral Health Policy Center at Children's Dental Health Project, is designed to highlight emerging trends in children's oral health and promote policies and programmatic solutions that are grounded in evidence-based research and practice. This issue of TrendNotes underscores the significance of preventing and managing childhood tooth decay – why it is imperative, what we know works, and why policymakers might want to realign policies and programs to be more consistent with this goal. It focuses policymakers' attention on the trends, opportunities and options to improve oral health for all children at lower cost through the best use of prevention, disease management, care coordination, and maximized resources.

State policymakers are increasingly focusing on children's oral health as a major policy issue, spurred in part by the 2000 U.S. Surgeon General's Report on Oral Health, the high profile death of a child from consequences of a preventable dental infection, and expanded dental provisions in the reauthorization of the Children's Health Insurance Program (CHIP). This heightened focus on children's oral health is reflected in new legislation, press coverage, and efforts by state and local oral health coalitions to advance improvements in children's oral health policies and programs. Policy activity has resulted in both successes and frustrations as oral health competes for scarce resources and the costs of both appropriate and inappropriate dental care continue to escalate. Efforts to reform health care present a significant opportunity to address the resurgence of childhood tooth decay among key populations of children.

Children's Oral Health Matters

Children's oral health is essential to child development and optimal overall health and wellbeing – a critical part of achieving key developmental milestones and function including eating, speaking, and attaining normal social and emotional development. Tooth decay, despite being preventable, remains the single most common chronic disease of U.S. children, affecting 26% of preschoolers, 44% of Kindergarteners, and more than half of teens.[1] Low-income and minority children are particularly affected as they experience the highest rates of this disease yet have the lowest rates of dental care.

Poor oral health can have significant effects on overall health, particularly in adulthood, and has been associated with heart and lung diseases, stroke, and low weight births.[2] In fact, the legacy of poor oral health in childhood is reflected in the health of young people entering the military. The Department of Defense reports that 42% of new Army recruits could not be deployed until their dental problems were addressed.[3]

Dental Caries is a Chronic Disease that is Preventable and Manageable

Dental caries – the disease process that causes cavities – is largely preventable, highly manageable, and chronic. It is a complex disease process involving the interplay of diet, fluoride, and genetics that results in individual levels of risk for cavities.[4] A family history of dental caries, lack of appropriate fluoride exposure, and frequent sugar intake are among the key risk factors for tooth decay. (See the text box: *The Disease Basics of Childhood Dental Caries*.)

Dental caries is typically established in the first few years of a child's life, with teeth being potentially susceptible to decay soon after they first appear. The occurrence of tooth decay before the age of six years – known as Early Childhood Caries (ECC) – is of particular concern because past caries experience, including having cavities in childhood, is the best predictor of tooth decay across the lifespan.[5]

Children's oral health cannot be addressed without considering the fundamental social determinants of health – the conditions in which people are born, grow, live, work and age, including the health system – that are shaped by the distribution of resources at the global, national and local levels and are mostly responsible for health inequities, according to the World Health Organization.

Public Health Interventions Focused on Prevention Can be Cost Saving

The decline in dental caries among children has mainly been due to successful, well-established public health strategies that include community water fluoridation, dental sealant programs, and public education and awareness campaigns. Long-standing, community-based public health strategies also have been successful in providing a return on public investment for those who are at the greatest risk.

- Dental costs for children enrolled in Medicaid for five continuous years who have their first preventive dental visit by age one are nearly 40% less ($263 compared to $447) than for children who receive their first dental visit after age one.[6]
- For every $1 invested in community water fluoridation $38 in dental treatment costs is saved.[7]
- School-based dental sealant programs save costs when they are delivered to children at high-risk for tooth decay. [8]

The Disease Basics of Childhood Dental Caries

Dental caries is a chronic, infectious disease caused by bacteria that are found in the mouth and transmissible from caretakers, particularly mothers, to children. When sugar and other complex carbohydrates are consumed, the bacteria produce acid that removes protective minerals (enamel) from the surface of the tooth (demineralization). If left undisturbed because of poor oral hygiene practices in combination with significant and frequent sugar intake, the bacteria can increase and over time, cause a cavity to form. In fact, the frequency of sugar intake not only feeds the cavity process but furthers the growth of decay-causing bacteria. The progression of dental caries depends on the balance of protective factors (e.g., saliva, fluoride) and disease factors in the mouth.

Dental caries is preventable and with appropriate early intervention and ongoing management, can actually be reversed. Preventive measures such as fluoride and dental sealants can prevent tooth decay. Fluoride reduces the ability of the bacteria to produce acid and promotes the remineralization of enamel, thereby preventing a cavity from continuing to form. Dental sealants are protective coatings applied to the chewing surfaces of teeth, typically in school-age children, to prevent tooth decay.

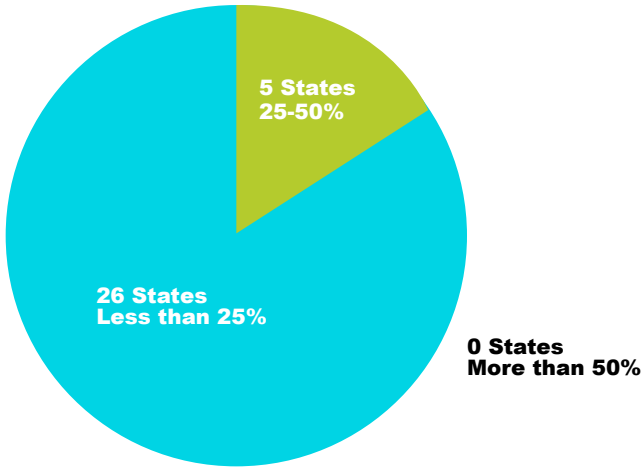
Sources: Exactly what is "Dental Caries"? Building a Definition from Research Washington, DC: Children's Dental Health Project. Morbidity and Mortality Weekly Report. Recommendations for using fluoride to prevent and control dental caries in the United States. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. August 17, 2001/50(RR14);1-42.

Many Children Lack Access to Dental Care

Parental awareness, public and private dental coverage, and availability of dental providers, especially for children in Medicaid, are critical factors in children obtaining needed dental care. Even though children enrolled in Medicaid are individually entitled under the law to comprehensive preventive and restorative dental services, dental care utilization for this population is low. The reasons for low utilization are many, but a lack of dental providers who participate in Medicaid is a key factor.[9]

Few dentists participate in Medicaid – less than as half of all active private dentists in some areas.[10] Low reimbursement rates, complex forms and burdensome administrative requirements are commonly cited by dentists as reasons for not participating in Medicaid.[11, 12]

Percentage of Dentists Seeing at Least 100 Medicaid patients in 31 States, 1999



Source: U.S. General Accountability Office. Factors Contributing to Low Use of Dental Services by Low-Income Populations. Washington, DC: U.S. General Accountability Office. 2000.

While children with private insurance coverage are more likely to obtain needed dental care than their counterparts, significant barriers still exist for this group. Private dental insurance coverage is often limited in scope, causing many families to pay high out-of-pocket costs for dental care.[13] In research of families that have experienced barriers to dental care, the inability to afford dental care was cited by over half (56%) of families. Among those families, 45% had private insurance coverage.[14, 15]

When children lack dental coverage and access to regular check-ups, dental care frequently waits until symptoms such as a toothache are severe and facial abscesses occur. In these cases, care is often sought in an emergency department where it is costly and likely to be limited to treating the immediate symptoms but not the underlying problem. In a recent California study, the number of emergency department visits for preventable dental conditions in children and adults grew at a rate higher than visits for diabetes.[16] Nearly a quarter of those with private health insurance used an emergency department for care. Most of the California children who presented in the emergency department for preventable dental conditions were young children ages 0-5.[17]

Opportunities to Address Dental Caries under CHIP Reauthorization Act (CHIPRA)

On February 4, 2009, President Obama signed into law the reauthorization of the Children's Health Insurance Program (CHIP). Included in the bill are eight major dental provisions that range from mandating dental coverage to encouraging primary preventive care. The new CHIP provisions include the following:

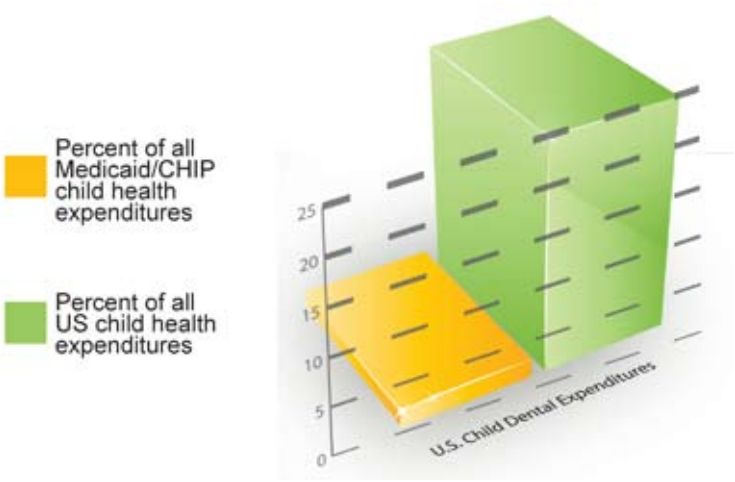
- Requires that states provide dental coverage for CHIP beneficiaries.
- Allows states to provide dental coverage that "wraps" around commercial medical coverage for children who are otherwise eligible for CHIP however they have private medical, but no dental insurance.
- Requires that states report on CHIP dental program performance.
- Establishes a requirement that parents of newborns be informed of risks for early childhood caries and its prevention.

Source and for more information: CHIP Reauthorization: Renewed Support for Children's Oral Health. Washington, DC: Children's Dental Health Project. March 2009. http://www.cdhp.org/downloads/2009Feb_CHIP%20Reauthorization%202.09.pdf

Tooth Decay Results in Significant Costs to Children, Families and the Health Care System

The personal, societal and financial costs of tooth decay are significant. In the most severe cases, Early Childhood Caries and its treatment have been associated with disability and even death.[18] Annual costs for dental services (all ages) were $95.3 billion in 2007[19] and are expected to increase in the next decade to $152.6 billion.[20] Current dental expenditures constitute nearly a quarter (25%–27%) of total health care spending for children in the U.S. However, dental care represents only one-tenth that level (2%-3%) in Medicaid spending for children who comprise more than one-quarter of the U.S. child population.[21]

U.S. Child Dental Expenditures



Dental expenditures for children reflect high costs for two sub-populations: 1. a small minority of children who experience severe early childhood caries and require treatment in the hospital operating room; and 2. a large number of children who receive regular preventive care despite being at low risk for developing cavities.[22] Advanced restorative dental care needed by roughly 15% of children and "catastrophic" care needed for 5% of children are estimated to consume 75% of all pediatric dental expenditures among low-income children.[23] Because children with ECC continue to be at high risk for cavities even after dental repair and because dental repair *per se* does not diminish underlying caries activity, relapse rates are extreme, ranging to over 50 percent.[24]

Most children experience little risk for dental caries and few cavities. However, a minority of children experience high risk and extreme and consequential disease. As childhood caries experience becomes increasingly concentrated in an ever smaller percentage of children, dental experts have called for "risk-based" preventive interventions, including individually-tailored preventive visit frequencies.[25] Risk-based interventions are not intended to supplant cost effective public health approaches such as community water fluoridation that benefit entire communities. Instead, such risk-based care would allow reallocation of current expenditures from excess care to more intense care of children at greatest risk for disease. Intensifying preventive care for at-risk children would, in turn, save significant public and private expenditures. One insurance executive stated that "Just keeping children out of the operating room gives us a big bang for the buck—probably a 45% savings for that alone."

When children lack dental coverage and access to regular dental check-ups, dental care is usually sought only when symptoms of disease become severe. Too often, this care is sought in emergency departments where treatment is costly and limited to the immediate symptoms of dental disease but not the underlying problem.

Dental Caries Intervention Should be Risk-Based

With the focus on risk-based individualized care, concepts from pediatric primary care medicine, including anticipatory guidance (counseling on preventive care topics) and chronic disease management through individualized care plans, are now beginning to find their way into dental education, financing, and dental practice. Yet, current dental financing, training, and delivery systems disproportionately support and reward traditional dental repair ("drilling and filling"). Consequently, many dental providers treat the end stage of the disease (cavities) rather than managing the disease (caries) as a bio-behavioral disease with a focus on prevention. National guidelines from pediatric primary care and dental organizations recommend that young children be assessed for early childhood caries risk no later than 1 year of age so that future preventive dental visits can be tailored to a child's risk level.[26] However, most dental providers continue to advise all patients to return for preventive visits every six months, resulting in less frequent oversight than is needed for those children at highest risk of cavities and potential excess visits for those at low risk. Lack of training in behavioral counseling, inexperience with young children, limited time, and low or no levels of reimbursement for counseling and risk-based management are some of the factors that have limited the ability of dental providers to manage dental caries as a chronic disease.[27]

Finally, opportunities to promote oral health and to intervene with children at-risk for dental caries are often missed in primary care settings (e.g., pediatrician's offices). In spite of national recommendations from pediatric and dental care provider groups on the importance of routine dental care,[28,29] a significant proportion of children do not receive any routine dental check-ups. In 2004, only 37.2% of all US children received a preventive dental service. Poor and low-income children were only about half as likely to have a dental visit as were higher income children despite their higher caries experience.[30] In a national study, advice from a health care provider on the need for routine dental check-ups was only offered for less than half of all children ages 2-17 years.[31] Primary care providers receive little training on the oral health of children even though they are an important access point for preventive care. Finally, few families are aware of the dynamics of this disease and how best to prevent it or manage its progression.[32]

In spite of the significant effects of tooth decay on children's oral health and wellbeing, much more work remains to be done if the disease burden is to be reduced."

Systems Can be Reoriented to Focus on Addressing Dental Caries as a Chronic Disease

Many leaders in the dental community now recognize the importance of promoting comprehensive public health efforts that have been shown to prevent dental caries with targeted intensive intervention efforts to those children at high risk for the disease. This overall approach – with systems of care that align resources to the most appropriate at-risk population – is becoming more common in other chronic health conditions including obesity prevention and treatment. [33] That realization coupled with over four decades of evidence-based research on "what works" in dental caries prevention and management are serving as a catalyst for efforts to consider how to realign and refocus policies, programs and investments accordingly.

In a system that addressed dental caries as a preventable and manageable chronic disease, universal, well-established public health strategies designed to promote the importance of oral health and prevent dental caries transmission would be provided to all children. Children deemed at high-risk for dental caries would receive a range of interventions including counseling and risk management to reduce further risk for dental caries progression. Finally, children at high-risk and with early or advanced disease would be provided intensive and ongoing services to treat and reverse progression of the disease. These practices would be embedded in a comprehensive system of care that includes: comprehensive public and private dental coverage, linkages with child-serving programs and systems (e.g., primary care, child care, schools, Head Start, WIC), workforce development, dental tracking and monitoring, and quality improvement efforts. New models for refocusing dental caries prevention and management efforts are beginning to be considered and used in more limited cases, as highlighted in the Early Childhood Caries Demonstration Project.

Many leaders in the dental community now recognize the importance of comprehensive oral health promotion and dental caries prevention initiatives combined with intensive intervention efforts targeted to those children at high risk for the disease.

The Early Childhood Caries Demonstration Project

DentaQuest Institute of Boston, Children's Hospital Boston (CHB), and Saint Joseph Hospital (SJH) (Providence, Rhode Island) formed a unique partnership to reduce and control cavities in young children who are at high-risk for early childhood caries (ECC). The Early Childhood Caries Demonstration Project is a redesign of the oral health care delivery system, based on the prevention and management of ECC. Its goals are to reduce new cavities in young children under age five, reduce operating room referrals, and reduce pain in young children.

CHB and SJH each operate large hospital-based dental clinics and like many programs of this kind nationwide, care for a disproportionate number of young children with ECC. These programs also confront months-long backlogs of young children awaiting extensive dental repair in the operating room. Even as they await restorative care, many young children experience pain and dysfunction that requires programs to "leapfrog" them to the head of the line. Once dental repair is provided, frequently under sedation or general anesthesia, many children experience unacceptably high rates of cavity recurrence (23–57 percent within 6–24 months). Moreover, the care provided in the operating room setting is costly: recent estimates at CHB found that the average charges per patient in 2006 were over $10,000, including charges for general anesthesia and dental treatment.

The ECDC Project is comprised of five core program components:

1. Screening and Enrollment: Dental providers working within the hospital dental clinics identify children with dental decay and past history of cavities. With parental consent, these young children are enrolled into the ECC project for ongoing intervention and follow-up.
2. Initial and Ongoing Assessment for Dental Caries Risk: Upon enrollment, dental clinicians conduct a Caries Risk Assessment to determine a child's risk for dental caries (e.g., diet, nutrition, fluoride exposure, feeding practices). Additionally, children's mouths are tested to determine oral bacteria levels. Children return for professional re-evaluation based on their risk level. Children deemed at high-risk for ECC return within one month and periodically thereafter for preventive and restorative treatment, until the dental caries is under control.
3. Parental/Caregiver Education: Families are educated on how to reduce the risk for ECC in their child through changes in diet, feeding practices (e.g., eliminating baby bottle use after 1 year) and judicious home applications of stannous fluoride.
4. Training of Pediatric Dental Residents: Since each hospital clinic is a teaching clinic, dental residents receive training to conduct caries risk assessments, provide counseling and develop risk-based strategies with the parent to manage dental caries as a chronic disease.
5. Development of Chronic Disease Management Protocols: The project is developing protocols to guide clinicians in the use of the ECC chronic disease management model.

Outcome data of the project in reducing recurrence of cavities in these young children are expected to be available in spring 2010. However, anecdotal evidence indicates that a significant proportion of patients are returning to the hospital clinics with improved outcomes.

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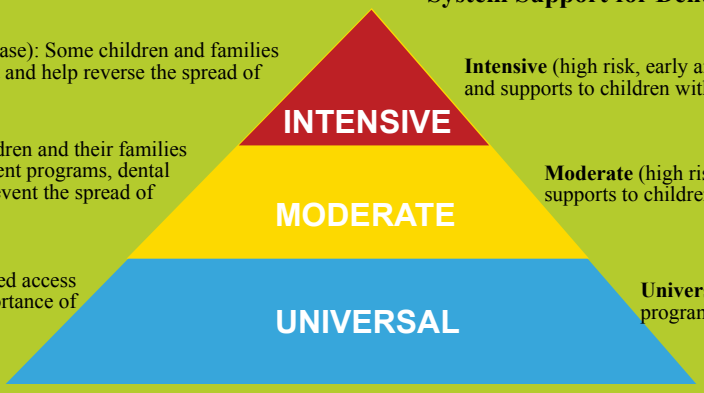
Preventing and Managing Childhood Tooth Decay

Needs of Young Children and Families

Intensive (high risk, early and advanced disease): Some children and families need access to intensive interventions to treat and help reverse the spread of dental caries.

Moderate (high risk, no disease): Many children and their families need access to counseling and risk management programs, dental sealant programs and other efforts to help prevent the spread of dental caries.

Universal: All children and their families need access to public health efforts that promote the importance of oral health and help prevent dental caries.



System Support for Dental Caries Prevention and Management

Intensive (high risk, early and advanced): Provide intensive individual services and supports to children with early and advanced dental caries.

Moderate (high risk, no disease): Provide individual services and supports to children at-risk for dental caries.

Universal: Provide universal, evidence-based, quality programs and services to prevent dental caries.

Intensive (high risk, early and advanced disease) (e.g., disease management program; diagnosis, preventive and restorative treatment plan)

Moderate (high risk, no disease) (e.g., counseling and risk management, fluoride varnish, dental sealant programs)

Universal (e.g., preventive dental check-ups, community water fluoridation, school-based preventive and screening programs, public education and awareness, dental tracking and reporting)

Core Elements of a Comprehensive System of Care

- Health Promotion and Disease Prevention
- Comprehensive Public and Private Dental Coverage
- Linkages with Child Serving Programs and Systems (e.g., primary care, child care, schools, Head Start, WIC)
- Quality Improvement
- Workforce Development
- Dental Tracking and Monitoring

Source: Adapted from the Oregon Model for Supporting Young Children's Social and Emotional Development in Early Childhood Care and Education Settings.

Implications for Policy and Practice

National and state policymakers, program administrators, children's advocates, and other key groups can advance strategies to prevent and manage dental caries in children, particularly low-income and minority children. These strategies, many of which are based on decades of established science and grounded in key principles advanced by the Children's Dental Health Project, include the following.[33]

- Develop evidence-based standards, guidelines and protocols for effective clinical, behavioral and nutritional approaches to assess individual risk, and to prevent and manage dental caries as a chronic disease. For example:
  - Invest in state level infrastructure that supports evidence-based, population-based prevention strategies such as school-based dental sealant programs and community water fluoridation.
  - Build upon and adapt existing oral health guidelines such as New York's *Oral Health Care During Pregnancy and Early Childhood Practice Guidelines* .

- Strengthen the education of dental providers (e.g., dentists, dental hygienists) and primary care providers (e.g., pediatricians, family physicians, nurse practitioners) on children's oral health, particularly in the areas of prevention, disease management and parent education. For example:
  - Encourage cross-training of medical and dental providers, and develop related programming in Early Childhood Caries management.
  - Encourage integration of oral health in primary care including prenatal visits.

- Provide incentives to professionals for education on and administration of dental caries prevention and management interventions including individualized care plans such as those used for managing childhood diabetes, asthma and obesity. For example:
  - Strengthen public (e.g., Medicaid, CHIP) and private financing systems to reimburse dental and primary care providers for fluoride varnish application, dental caries management activities, and patient referrals for appropriate care.

- Develop and strengthen policies and programs that provide dental care and education to women of child-bearing age, pregnant women and new mothers. For example:
  - Integrate dental caries disease management education into programs that serve women of child-bearing age and mothers (e.g., WIC, home visiting, Healthy Start).

- Enhance national and state policies and programs to strengthen a focus on dental caries as a chronic disease. For example:
  - Conduct a statewide summit designed to educate policymakers, providers and other key stakeholders on the need for realigning systems to focus on dental caries as a chronic disease.
  - Fund community-based demonstration programs on Early Childhood Caries disease management.

- Increase investments in national and statewide public awareness and education campaigns on the importance of children's oral health, emphasizing dental caries as a transmissible but preventable disease, and providing information on how to manage the disease. For example:
  - Inventory existing public awareness campaigns to determine opportunities to integrate dental caries prevention messages.
  - Develop state public awareness campaigns to educate the general public, providers and other key stakeholders on dental caries prevention and management.

Conclusion

The complex nature of dental caries requires a comprehensive, multi-pronged public health approach designed to promote the importance of oral health and prevent dental caries transmission in all children, and to target risk-based management efforts for those children who are more susceptible to the disease. Many important and successful initiatives exist at the national and state level. However, few policymakers and providers place a primary focus on addressing dental caries as a chronic disease that is preventable and manageable.

Federal and state investments are needed to expand well-proven programs. In some cases, current investments may need to be realigned to target the most appropriate populations. Expansions in the Children's Health Insurance Program, health care reform, and the renewed national focus on preventing chronic diseases and improving the quality of health care systems present tremendous opportunities to further advance children's oral health and ultimately, ensure that all children are healthy and achieve their optimal potential.

Trend Note Highlights

Better Health at Lower Costs: Policy Options for Managing Childhood Tooth Decay

While the oral health of children had been steadily improving, significant disparities remain[34] and tooth decay is again on the rise in young children.[35] Tooth decay is not only five times more common than asthma but consequential to children's lives.[36] Children who experience chronic tooth decay and its related pain and infection are susceptible to inadequate growth and development, speech problems, poor self-esteem, lost days in school, unhealthy adult teeth, and high costs for care treatment in childhood and adulthood.[37] Low-income and minority children experience the highest rates of disease and yet have the lowest rates of dental care.

Dental caries – the disease process that causes cavities – is largely preventable, highly manageable, and chronic. It is a complex disease process involving the interplay of diet, fluoride, and genetics that results in varying individual levels of risk for cavities.[38] Most children experience little risk for dental caries and few cavities. However, an important minority of children experience high risk and extreme and consequential disease.

Given the complex nature of this disease and the fact that it is more prevalent in certain groups of children, an efficient use of current resources may be enhanced with a combination of evidence-based prevention efforts and targeted disease management strategies. That realization coupled with over four decades of evidence-based research on "what works" in dental caries prevention and management are serving as a catalyst for efforts to consider how to realign and refocus policies, programs and investments. Addressing dental caries as a chronic disease that is mostly preventable and highly manageable is central to these efforts.

Policymakers, program administrators, children's advocates, and others can advance strategies to prevent and manage dental caries in children, particularly low-income and minority children. These strategies, many of which are based on decades of established science and grounded in key principles advanced by the Children's Dental Health Project, include the following:

- Develop national evidence-based standards, guidelines and protocols for effective clinical, behavioral and nutritional approaches to assess individual risk, and to prevent and manage dental caries as a chronic disease.
- Strengthen the education of dental providers (e.g., dentists, dental hygienists) and primary care providers (e.g., pediatricians, family physicians, nurse practitioners) about children's oral health, particularly in the areas of prevention, disease management and parent education.
- Provide incentives to professionals for dental caries prevention and management interventions, including individualized care plans such as those used for managing childhood diabetes, asthma and obesity.
- Develop and strengthen policies and programs that provide dental care and education to women of child-bearing age, pregnant women and new mothers.
- Enhance national and state policies and programs to strengthen the focus on dental caries as a chronic disease.
- Increase investments in national and statewide public awareness and education campaigns on the importance of children's oral health, emphasizing that dental caries is a transmissible but preventable disease, and providing information on how to manage the disease.
- Develop state public awareness campaigns to educate the general public, providers and other key stakeholders on dental caries prevention and management.

About the Children's Dental Health Project and the National Oral Health Policy Center

Founded in 1997, Children's Dental Health Project (CDHP) is a national nonprofit organization with the vision of achieving equity in children's oral health. CDHP designs and advances research-driven policies and innovative solutions by engaging a broad base of partners committed to children and oral health, including professionals, communities, policymakers, and parents.

The National Oral Health Policy Center at Children's Dental Health Project was created in 2008 as a collaborative effort of the Association of Maternal and Child Health Programs (AMCHP), Association of State and Territorial Dental Directors (ASTDD), Medicaid/SCHIP Dental Association (MSDA), and National Academy for State Health Policy (NASHP) with funding from the federal Maternal and Child Health Bureau of the Department of Health and Human Services, Health Resources and Services Administration. The Policy Center promotes the understanding of effective policy options to address ongoing disparities in children's oral health. The three-year initiative has set out to map a course for improving family oral health by building knowledge and skills of professionals with the ability to steer systems changes.

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Feedback for Future Trend Notes Topics:

The National Oral Health Policy Center covers emergent and emerging trends in children's oral health to educate policymakers and to advance policies and practices that improve oral health for all children, including those with physical and social vulnerabilities. Possible topics of future Trend Notes include:

- Dental quality measures
- Dental care financing
- The impact of public awareness campaigns on children's oral health

To provide your feedback to this publication and submit ideas for future Trend Notes please go to: http://survey.constantcontact.com/survey/a07e2l81913g0761g00/start

For Further Information:

The Children's Dental Health Project would like to know how policymakers are using Trend Notes and hear about additional topics of interest. To help inform future Trend Notes topics and for more information about children's oral health or this Trend Note please contact: Meg Booth, Deputy Executive Director, Children's Dental Health Project, at (202) 833-8288.

Endnotes:

Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thorton-Evans G, et al. Trends in oral health status: United States, 1988-1994 and 1999-2004. National Center for Health Statistics. Vital Health Stat 11(248) 2007.

2. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. 2000.

3. Chaffin MA, Marburger T, Fretwell D. Dental class 3 intercept clinic: a model for treating dental class 3 soldiers. *Military Medicine*. 168 (7): 548-52. July 2003.

4. Fejerskov O. Changing paradigms in concepts on dental caries; consequences for oral health care. *Caries Research*; 38: 182-191. 2004.

5. Powell LV. Caries prediction: a review of the literature. Community Dent Oral Epidemiology 1998;26:361-71.

6. Savage MF, Lee JY, Kotch JB, Vann WF Jr. Early preventive dental visits: effects on subsequent utilization and costs. *Pediatrics* 2004;114:e418-23.

7. Centers for Disease Control and Prevention. Oral Health Resources Fact Sheet. Cost Savings of Community Water Fluoridation. Accessed 4/6/09 at: http://www.cdc.gov/fluoridation/fact_sheets/cost.htm

8. Preventing Chronic Diseases: Investing Wisely in Health. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Accessed 4/1/09 at www.oralhealth@cdc.gov

9. U.S. General Accountability Office. Factors Contributing to Low Use of Dental Services by Low-Income Populations. Washington, DC: U.S. General Accountability Office. 2000.

10. Gehshan S, Hauck P, and Scales J. Increasing dentists' participation in Medicaid and SCHIP. Washington, DC: National Conference of State Legislatures. 2001. Accessed 8/1/09 at: http://ecom.ncsl.org/bookstore/productdetail.htm?prodid=0168000002&catsel=xhlt%3BHealth

11. Edelstein B. Barriers to Medicaid Dental Care. Washington, DC: Children's Dental Health Project. 2000. Access 8/1/09 at: http://www.cdhp.org/resource/barriers_medicaid_dental_care

12. Krol D and Wolf JC. Physicians and dentists attitudes toward Medicaid and Medicaid patients: review of the literature. Columbia University. 2009.

13. The Costs of Dental Care and the Impact of Dental Insurance Coverage. Boston, MA: The Access Project. Issue Brief No. 4. February 2009. Accessed 8/1/09 at: http://www.accessproject.org/new/pages/item95.php

14. Chu, M. Children's Dental Care: Periodicity of Checkups and Access to Care, 2003. Statistical Brief #113. January 2006. Agency for Healthcare Research and Quality, Rockville, Md. Accessed 8/1/09 at: http://meps.ahrq.gov/mepsweb/data_files/publications/st113/stat113.pdf.

15. Duderstadt KG, Huges DC, Soobader MJ and Newacheck PW. The impact of public insurance expansions on children's access and use of care. *Pediatrics* 118; pp 1676-1682; 2006.

16. Emergency Department Visits for Preventable Dental Conditions in California. Oakland, CA: California Healthcare Foundation. 2009. Accessed 8/1/09 at: http://www.chcf.org/topics/view.cfm?itemid=133902

17. Ibid

18. Casamassimo P, Thikkurissy S, Edelstein B and Maiorini E. Beyond the dmft: the human and economic cost of early childhood caries. *JADA*; 140: 650-656; June 2009.

19. Centers for Medicare and Medicaid Services, US Department of Health and Human Services. National Health Expenditures by type of service and source of funds, CY 1960-2007 (ZIP, 39 KB). Accessed 7/20/09 at http://www.cms.hhs.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp#TopOfPage

20. Centers for Medicare and Medicaid Services, US Department of Health and Human Services. NHE Historical and projections, 1965-2018. Accessed 7/23/09 at http://www.cms.hhs.gov/NationalHealthExpendData/03_NationalHealthAccountsProjected.asp#TopOfPage

21. Reforming States Group. Pediatric Dental Care in CHIP and Medicaid: Paying for What Kids Need, Getting Value for State Payments. 1999. Milbank Memorial Fund. New York City.

22. Improving Pediatric Health: Biobehavioral Approaches to Childhood Disease Management: The System – Access, Financing, Coordination. New York Academy of Sciences. Accessed 7/23/09 at http://www.nyas.org//Publications/EBriefings/Detail.aspx?cid=3b059cbf-1432-466d-af1e-1335b16428a5

23. Ibid

24. Berkowitz, RJ. op.cit.

25. American Academy of Pediatric Dentistry. Guideline on Periodicity of Examination, Preventive Dental Services, Anticipatory Guidance/Counseling, and Oral Treatment for Infants, Children, and Adolescents. Accessed 7/23/09 at http://www.aapd.org/media/Policies_Guidelines/G_Periodicity.pdf

26. Oral Health Risk Assessment Timing and Establishment of the Dental Home. *Pediatrics*; 111 (5): 1113-1116; 2003.

27. Preventive Oral Health Intervention for Pediatricians. Policy Statement. *Pediatrics*; 122: 1387-1394; 2008.

28. Dental provider groups recommend that children have two dental visits per year beginning at age one or within six months of the eruption of the first tooth. Pediatricians recommend that children begin regular visits to the dentist in the early toddler years and by one year of age for children who are deemed at high-risk for caries.

29. American Academy of Pediatrics. Policy Statement. Oral health risk assessment timing and establishment of the dental home. *Pediatrics*; 111 (5); May 2003.

30. Manski RJ, Brown E. Dental use, expenses, private dental coverage and changes, 1996 and 2004. Rockville (MD): Agency for Healthcare Research and Quality; 2007. MEPS Chartbook No. 17.

31. American Academy of Pediatrics. May 2003. op. cit.

32. Ibid

33. Humphrey Schmidt A. The Role of Disease Management in Next Generation Obesity Prevention Programs. Tulane University, School of Public Health and Tropical Medicine. 2009. Accessed 9/17/09 at: http://www.dmaa.org/theforum08/presentations/Humphrey_Schmidt.pdf.

34. Principles on Preventing and Managing Pediatric Dental Caries. Washington, DC: Children's Dental Health Project. 2008. Accessed 8/1/09 at http://www.cdhp.org.php5-4.websitetestlink.com/resource/cdhp_principles_preventing_and_managing_pediatric_dental_caries

35. Centers for Disease Control and Prevention. Children's Oral Health. Accessed 4/6/09 at: http://www.cdc.gov/oralhealth/publications/factsheets/sgr2000_fs3.htm

36. Dye, BA. op.cit.

37. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000. Accessed 8/1/09 at: http://www.surgeongeneral.gov/library/oralhealth/

38. Ibid

39. Fejerskov O. Changing paradigms in concepts on dental caries; consequences for oral health care. *Caries Research*; 38: 182-191. 2004.