

## Research Brief

# Dental-Related Emergency Department Visits on the Increase in the United States

**Authors:** Thomas Wall, M.A., M.B.A.; Kamyar Nasseh, Ph.D.

The Health Policy Institute (HPI) is a thought leader and trusted source for policy knowledge on critical issues affecting the U.S. dental care system. HPI strives to generate, synthesize, and disseminate innovative research for policy makers, oral health advocates, and dental care providers.

### Who We Are

HPI's interdisciplinary team of health economists, statisticians, and analysts has extensive expertise in health systems policy research. HPI staff routinely collaborates with researchers in academia and policy think tanks.

### Contact Us

Contact the Health Policy Institute for more information on products and services at [hpi@ada.org](mailto:hpi@ada.org) or call 312.440.2928.

## Key Messages

- *Emergency department (ED) visits for dental conditions are increasing, driven primarily by a larger share of dental visits taking place in EDs rather than dental offices.*
- *Decreases in private dental insurance coverage among young adults combined with significant reductions in adult dental Medicaid programs have created a financial barrier that could have led to a substitution of dental ED visits for dental office visits.*
- *Unfortunately, the Affordable Care Act does not address increased dental utilization in EDs or generate effective solutions to increase access to dental care in office settings.*
- *Several programs have demonstrated success in reducing ED use for non-traumatic dental conditions. These programs should be expanded.*
- *Without further interventions from policy makers, dental ED visits are likely to increase in the future, straining the health care system and increasing overall health care costs.*

## Introduction

A number of studies based on individual hospitals, cities or states have reported an increase in dental-related emergency department (ED) visits in the U.S.<sup>1 2 3 4 5 6 7</sup> Studies have also shown that, for the U.S. as a whole, per-capita dental ED visits have been increasing, and that dental ED visits are growing as a percentage of all ED visits.<sup>8 9 10</sup>

Most dental ED visits are for non-traumatic dental conditions, and in most cases, ED healthcare providers provide prescriptions for pain or antibiotics for infections.<sup>11 12 13</sup> For example, a 2009 study based on the National Emergency Department Sample (NEDS) reported that dental caries were the principle diagnosis for 41.8% of all ED visits for dental conditions.<sup>14</sup> Patients who present at an ED with a non-traumatic dental condition would be better served in a dental office setting due to the availability of definitive care and the likelihood of continuity of care.<sup>15</sup>

## Research Brief

The number of ED visits also has grown. According to one study, between 1997 and 2007, the increase in per-capita ED visit rates was almost double of what would be expected from population growth.<sup>16</sup> This increase in ED visits has coincided with a decrease in the number of Emergency Departments nationwide.<sup>17</sup> Thus, EDs nationwide are under pressure to provide care for more patients. Inappropriate and continuous use of EDs for non-traumatic dental visits strain the health care system, contribute to overcrowding, increased care costs and longer wait times for patients with urgent health conditions.<sup>18</sup>

Nationally, dental ED visits have been growing faster than overall ED visits and understanding the factors behind this trend is important. In this research brief, we have three objectives. First, we develop a simple framework to identify key components that drive dental ED visits. Second, we use various data sources to identify which factors are most important in explaining the increase in dental ED visits. Finally, we discuss the policy implications of our findings.

### Data & Methods

In this analysis, we used annual dental utilization data from the Medical Expenditure Panel Survey (MEPS), which is managed by the Agency for Healthcare Research and Quality (AHRQ). The MEPS is a nationally representative survey of the non-institutionalized U.S. population. Data contained in the MEPS includes information on demographics, health conditions, health status, health expenditures, access to care, health insurance coverage, family income, employment status and utilization of medical services. We focused on the period 2000 to 2010, the most recent year for which data are available. The MEPS is recognized as the most reliable data source for dental care utilization at the national level.<sup>19</sup>

For information regarding the annual number of dental-related ED visits, we analyzed data from the National

Hospital Ambulatory Medical Care Survey (NHAMCS), which is based on a national probability sample of visits to EDs of nonfederal general and short-stay hospitals in the United States. A dental ED visit was defined as those ED visits with a primary diagnosis ICD-9 code in the following range: 520.0 to 526.9. These codes correspond to Clinical Software Classification category 136 – disorders of the teeth and jaw.<sup>20</sup> Estimates of the U.S. population were based on census and inter-census estimates of the U.S. residential population from the U.S. Census Bureau.<sup>21</sup>

We defined total dental visits for each year as the sum of visits to a dentist (MEPS) plus dental ED visits (NHAMCS). We also estimated the percent of ED visits that were related to dental conditions for each year. This annual percentage is determined by (1) the percentage of all dental visits that took place in an ED, (2) the percentage of the population with any dental visit (i.e., dental office or ED) in a given year and (3) percentage of the population that had an ED visit.<sup>22</sup>

The percent of ED visits that were related to dental conditions was defined as the number of dental ED visits divided by the number of total ED visits based on a NHAMCS file for a given year. The percentage of all dental visits that took place in an ED was defined as the total number of dental ED visits estimated from the NHAMCS divided by the total number of dental visits estimated from the MEPS and the NHAMCS. The percentage of the population with any dental visit was defined as the total number of dental visits estimated from the MEPS and the NHAMCS divided by an estimate of the U.S. civilian population. The percentage of the population that had an ED visit was defined as the total number of ED visits estimated from the NHAMCS divided by an estimate of the U.S. civilian population. We then analyzed these components to determine what factor could be driving the increase in dental ED visits. We used a chi-square test to test for a significant difference in dental ED

visits as a percent of total ED visits between 2000 and 2010.

## Results

According to the NHAMCS, the number of dental ED visits in the U.S. increased from 1.1 million in 2000 to 2.1 million in 2010. As shown in Figure 1, dental ED visits as a percent of total ED visits increased from 1.06% in 2000 to 1.65% in 2010 and this change was statistically significant. Twice during this period of time (i.e., 2002 to 2004 and 2006 to 2008) growth in dental ED visits as a percent of total ED visits appears to have leveled off, only to be followed by further increases.

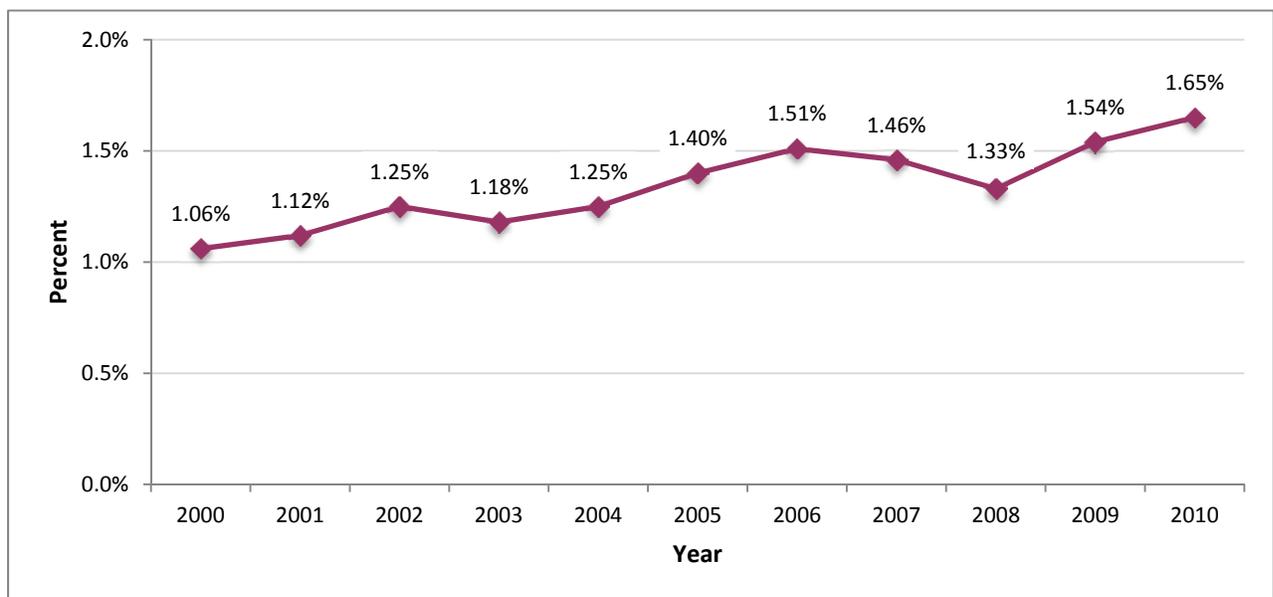
Figure 2 summarizes trends across time in each of the components that factored into the increase in dental ED visits as a percent of total ED visits. To illustrate

the relative importance of each component, we indexed all variable values to 100 in the year 2000.

The indexed trend lines in Figure 2 show that the increase in dental ED visits as a percentage of all ED visits was driven primarily by an increase in dental ED visits as a percentage of total dental visits. From 2004 to 2006, and again from 2008 to 2010, dental ED visits grew at a faster absolute rate than total dental visits.

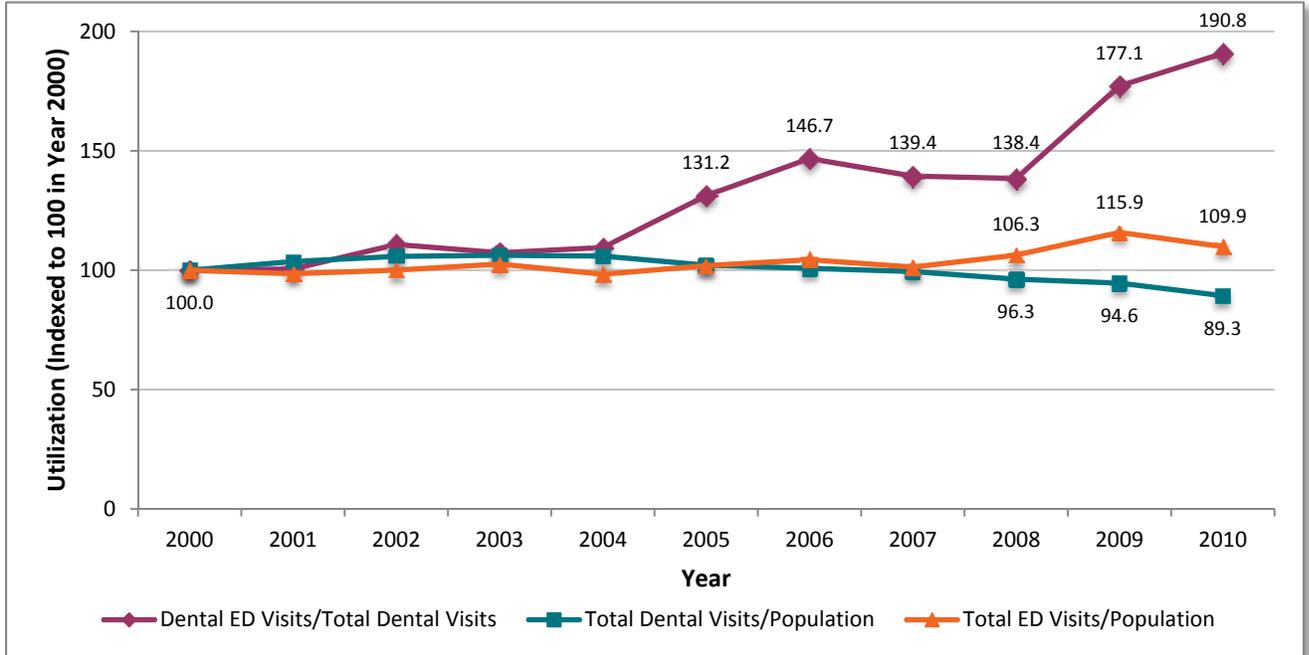
Figure 3 shows trends in dental ED visits as a percentage of total dental visits, by patient age. It is clear that young adults 21 to 34 accounted for most of the overall increase in the percentage of dental visits that took place in an ED setting. The percentage of dental ED visits to total dental visits did not change among other age groups.

**Figure 1:** Dental Emergency Department Visits as a Percent of Total Emergency Department Visits in the United States, 2000 to 2010



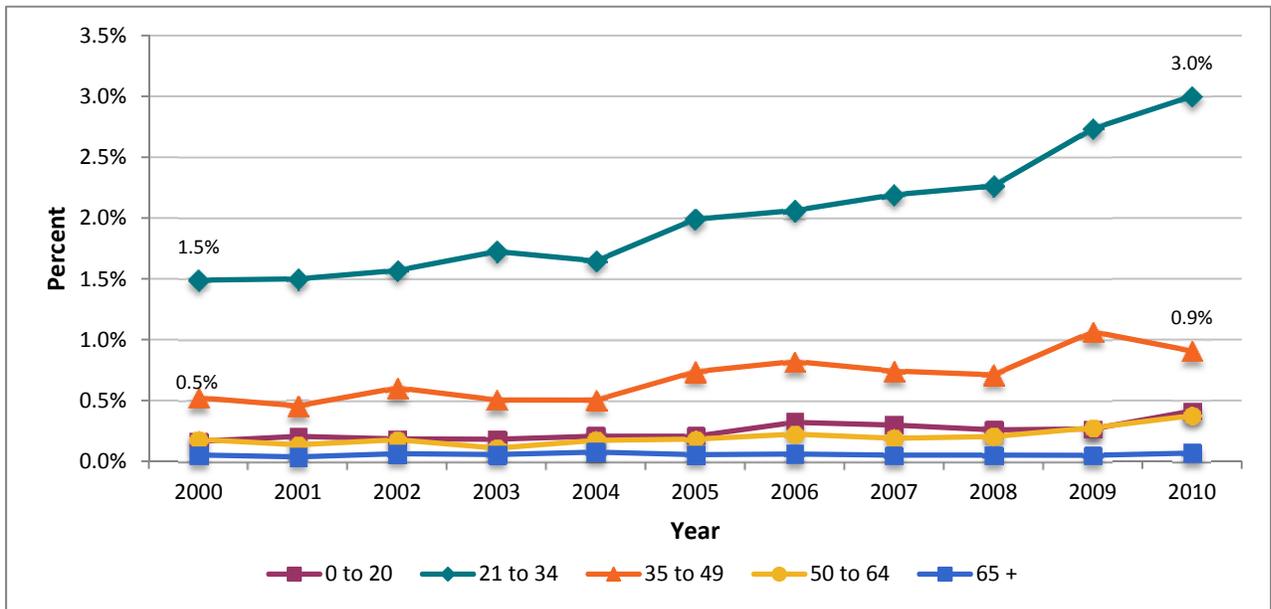
**Source:** National Hospital Ambulatory Medical Care Survey, NCHS. **Note:** Change from 2000 to 2010 is statistically significant at the 1% level.

**Figure 2:** Trends over Time in Various Components of Dental Emergency Department Use for Dental Services in the United States, 2000 to 2010 (Indexed to 100 in Year 2000)



Sources: National Hospital Ambulatory Medical Care Survey, NCHS; Medical Expenditure Panel Survey, AHRQ; Census Bureau.

**Figure 3:** Dental Emergency Department Visits as a Percent of Total Dental Visits by Age in the United States, 2000 to 2010



Sources: National Hospital Ambulatory Medical Care Survey, NCHS; Medical Expenditure Panel Survey, AHRQ.

## Discussion

Our results show that the percent of ED visits that were dental related increased from 2000 to 2010, and that this increase was driven by an increase in dental ED visits as a percent of total dental visits. This increase in dental ED visits as a percent to total dental visits was driven by young adults. We hypothesize that this increase is related to a decline in dental benefits among adults in this age group. Based on various estimates on the average cost of a dental ED visit<sup>23 24</sup>, it cost the healthcare system anywhere from \$867 million to \$2.1 billion to treat dental conditions in hospital EDs in 2010.

Previous studies have shown that, compared to other ED visits, patients with dental ED visits are more likely to be young or middle-aged adults, and more likely to have Medicaid or no health insurance.<sup>25 26</sup> We report in a related research brief that the percent of adults aged 19-49 with private dental benefits declined from 2000 to 2010.<sup>27</sup>

The past decade has also seen significant reductions of adult Medicaid dental benefits in some states.<sup>28</sup> There is compelling evidence as to the positive effect benefit expansions have on access to dental care<sup>29</sup> and the adverse impact that benefit reductions have on low-income adults.<sup>30 31 32</sup> For example, eliminating adult dental benefits in Oregon caused a threefold increase in the level of unmet dental care needs and substantially higher likelihood of emergency room visits for oral health issues.<sup>33</sup>

Related to the decline in private dental benefits among adults and the reductions of adult Medicaid dental benefits was an increase from 2003 to 2010 in the percent of the population who report that they could not afford dental care during the past 12 months.<sup>34</sup> The age group with the highest percentage reporting financial barriers to obtaining dental services was

young adults 21 to 34, followed by adults 35 to 49 years of age.<sup>35</sup> In a recent study, we have shown that the main factor explaining the decline in adult utilization during the 2000s was a shift in the pattern of dental benefits. That is, the share of adults with private dental benefits decreased while the share with no dental benefits increased during the 2000s.<sup>36</sup>

The deterioration in private and public dental benefits coverage for adults has clearly created significant financial barriers to dental care – especially among young adults. Our results strongly suggest that this increase in financial barriers to dental care for younger adults could have led to a substitution of dental ED visits for dental office visits.

Unfortunately, the Affordable Care Act (ACA) did little to address the issue of dental utilization in emergency departments. The ACA does not mandate dental benefits for adults, nor are dental benefits likely to be included in the essential benefit packages in insurance plans sold through most states' exchanges under provisions of the law.<sup>37</sup> Recent research has also shown that the ACA will not dramatically increase access to dental benefits for poor adults through Medicaid and will have little impact in providing adult private dental coverage through the exchanges.<sup>38</sup> Hence, the ACA does not meet one of its primary aims to increase access to health care<sup>39</sup>, particularly oral care in the office setting, which could help mitigate this rising trend in dental ED visits.

Policy makers are beginning to look at other innovations to improve access to dental care for adults. Pilot programs in several states have demonstrated the effectiveness of ED diversion programs targeted to patients who present at an ED with a dental-related complaint.<sup>40 41 42</sup> A program at a Virginia hospital was developed to divert ED patients with a dental complaint

## Research Brief

to a special urgent dental care clinic located in the hospital's oral and maxillofacial surgery clinic. Dental ED visits decreased more than 52% during the first year of the pilot program.<sup>43</sup>

In the coming years, advocates for oral health will have to consider other innovative ways to increase access to

dental care in order to decrease dental care utilization in hospital emergency departments. Without further interventions from policy makers, dental ED visits are likely to increase in the future, straining our health care system and increasing overall health care costs. Now more than ever, innovative solutions are needed to improve access and oral health.

---

This Research Brief was published by the American Dental Association's Health Policy Institute.

211 E. Chicago Avenue  
Chicago, Illinois 60611  
312.440.2928  
[hpi@ada.org](mailto:hpi@ada.org)

For more information on products and services, please visit our website, [www.ada.org/hpi](http://www.ada.org/hpi).

## References

- <sup>1</sup> Maiuro L. Eliminating adult dental benefits in Medi-Cal: an analysis of impact. California Healthcare Foundation. December 2011. Available from: <http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/E/PDF%20EliminatingAdultDentalMediCalcx.pdf>. Accessed April 9, 2013.
- <sup>2</sup> Hong L, Ahmed A, McCuniff M, Liu Y, Cai J, Hoff G. Secular trends in hospital emergency department visits for dental care in Kansas City, Missouri, 2001-2006. *Public Health Rep.* 2011;126(2):210-219.
- <sup>3</sup> Ladrillo T, Hobdell M, Caviness C. Increasing prevalence of emergency department visits for pediatric dental care, 1997-2001. *J Am Dent Assoc.* 2006;137(3):379-385.
- <sup>4</sup> Rowley S, Sheller B, Williams B, Mancini L. Utilization of a hospital for treatment of pediatric dental emergencies. *Pediatr Dent.* 2006;28(1):10-7.
- <sup>5</sup> Lee H, Lewis C, Saltzman B, Starks H. Visiting the emergency department for dental problems: trends in utilization, 2001 to 2008. *Am J Public Health.* 2012;102(11):e77-83.
- <sup>6</sup> Anderson L, Cherala S, Traore E, Martin N. Utilization of hospital emergency departments for non-traumatic dental care in New Hampshire, 2001-2008. *J. Community Health.* 2011;36(4):513-6.
- <sup>7</sup> Waldrop R, Ho B, Reed S. Increasing frequency of dental patients in the urban ED. *Am J Emerg Med.* 2000;18(6):687-9.
- <sup>8</sup> Okunseri C, Okunseri E, Thorpe J, Xiang Q, Szabo A. Patient characteristics and trends in nontraumatic dental condition visits to emergency departments in the United States. *Clinical, Cosmetic and Investigational Dentistry.* 2012;4:1-7.
- <sup>9</sup> Wall T. Recent trends in dental emergency department visits in the United States – 1997/1998 to 2007/2008. *J Public Health Dent.* 2012;72:216-220.
- <sup>10</sup> Lee H, Lewis C, Saltzman B, Starks H. Visiting the emergency department for dental problems: trends in utilization, 2001 to 2001. *Am J Public Health.* 2012;102(11):e77-83.
- <sup>11</sup> Lewis C, Lynch H, Johnston B. Dental Complaints in emergency departments: a national perspective. *Ann Emerg Med.* 2003;42(1):93-99.
- <sup>12</sup> McCormick at al. Reducing the burden of dental patients on the busy hospital emergency department. *J Oral Maxillofac Surg.* 2013; 71:475-78.
- <sup>13</sup> Lee HH, Lewis CW, Saltzman B, Starks H. Visiting the emergency department for dental problems: trends in utilization, 2001 to 2008. *Am J Public Health.* 2012;102(11):e77-83.
- <sup>14</sup> Seu K, Hall KK, Moy E. Emergency department visits for dental-related conditions, 2009. HCUP Statistical Brief #143. Agency for Healthcare Research and Quality, Rockville, MD. November 2012. Available from: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb143.pdf>. Accessed May 9, 2013.
- <sup>15</sup> Okunseri C, Okunseri E, Thorpe J, Xiang Q, Szabo A. Patient characteristics and trends in nontraumatic dental condition visits to emergency departments in the United States. *Clinical, Cosmetic and Investigational Dentistry.* 2012;4:1-7.
- <sup>16</sup> Tang N, Stein J, Hsia RY, Maselli JH, Gonzales R. Trends and characteristics of US Emergency Department Visits, 1997-2007. *JAMA.* 2010;304(6):664-70.
- <sup>17</sup> Institute of Medicine on the National Academies. Future of emergency care: hospital-based emergency care: at the breaking point. Washington, DC: National Academic Press;2007.
- <sup>18</sup> Okunseri C, Okunseri E, Thorpe J, Xiang Q, Szabo A. Patient characteristics and trends in nontraumatic dental condition visits to emergency departments in the United States. *Clinical, Cosmetic and Investigational Dentistry.* 2012;4:1-7.
- <sup>19</sup> Macek MD, Manski RJ, Vargas CM, Moeller JF. Comparing oral health care utilization estimates in the United States across three nationally representative surveys. *Health Serv Res.* 2002; 37(2):499–522.

<sup>20</sup> Elixhauser A, Steiner C, Palmer L. Clinical Classifications Software (CCS), 2011. US Agency for Healthcare Research and Quality. Available from: <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp> Accessed May 9, 2013.

<sup>21</sup> U.S. Census Bureau, Population Estimates, 2000-2010 Intercensal Estimates. Available from: <http://www.census.gov/popest/data/historical/2000s/index.html>. Accessed May 9, 2013.

<sup>22</sup> The following equation determines the relationship between the percentage of ED visits that were dental related and the other factors described in our model

$$\frac{\# \text{ ED Dental Visits}}{\# \text{ ED Visits}} = \frac{\frac{\# \text{ ED Dental Visits}}{\text{Total no. Dental Visits}} * \frac{\text{Total no. Dental Visits}}{\text{US Pop}}}{\frac{\# \text{ ED Visits}}{\text{US Pop}}}$$

<sup>23</sup> Tanner L. More Americans seeking dental treatment at the ER. USA Today. February 27, 2012. Available from: <http://usatoday30.usatoday.com/news/health/story/health/story/2012-02-28/More-Americans-seeking-dental-treatment-at-the-ER/53274176/1>. Accessed May 9, 2013.

<sup>24</sup> Hong L, Ahmed A, McCuniff M, Liu Y, Cai J, Hoff G. Secular trends in hospital emergency department visits for dental care in Kansas City, Missouri, 2001-2006. *Public Health Rep.* 2011;126(2):210-219.

<sup>25</sup> Seu K, Hall KK, Moy E. Emergency department visits for dental-related conditions, 2009. HCUP Statistical Brief #143. Agency for Healthcare Research and Quality, Rockville, MD. November 2012. Available from: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb143.pdf>. Accessed May 9, 2013.

<sup>26</sup> Lewis C, Lynch H, Johnston B. Dental Complaints in emergency departments: a national perspective. *Ann Emerg Med.* 2003;42(1):93-99.

<sup>27</sup> Vujicic M, Goodell S, Nasseh K. Dental benefits to expand for children, likely decrease for adults in coming years. Health Policy Institute Research Brief. American Dental Association. 2013. Available from: [http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief\\_0413\\_1.pdf](http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief_0413_1.pdf). Accessed May 9, 2013.

<sup>28</sup> Myers J. The Rundown. How Have Medicaid Dental Benefits Changed in Your State? PBS; November 17, 2011. Available from: <http://www.pbs.org/newshour/rundown/2011/11/how-have-medicaid-dental-benefits-changed-in-your-state-1.html>. Accessed May 9, 2013.

<sup>29</sup> Choi MK. The impact of Medicaid insurance coverage on dental service use. *J Health Econ.* 2011;30:1020-1031.

<sup>30</sup> Maiuro L. Eliminating adult dental benefits in Medi-Cal: an analysis of impact. California Healthcare Foundation. December 2011. Available from: <http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/E/PDF%20EliminatingAdultDentalMediCalcx.pdf>. Accessed April 9, 2013.

<sup>31</sup> Wallace NT, Carlson MJ, Mosen DM, Snyder JJ, Wright BJ. The individual and program impacts of eliminating Medicaid dental benefits in the Oregon Health Plan. *Am J Public Health.* 2011;101(11):2144-50.

<sup>32</sup> Cohen LA, Manski RJ, Hooper FJ. Does elimination of Medicaid reimbursement affect the frequency of emergency department visits? *J Am Dent Assoc.* 1996;127(5):605-9.

<sup>33</sup> Wallace NT, Carlson MJ, Mosen DM, Snyder JJ, Wright BJ. The individual and program impacts of eliminating Medicaid dental benefits in the Oregon Health Plan. *Am J Public Health.* 2011;101(11):2144-50.

<sup>34</sup> American Dental Association. Breaking down barriers to oral health for all Americans. The role of finance. Chicago (IL). April 2012. Available from: [http://www.ada.org/sections/advocacy/pdfs/7170\\_Breaking\\_Down\\_Barriers\\_Role\\_of\\_Finance-FINAL4-26-12.pdf](http://www.ada.org/sections/advocacy/pdfs/7170_Breaking_Down_Barriers_Role_of_Finance-FINAL4-26-12.pdf). Accessed May 9, 2013.

<sup>35</sup> American Dental Association. Breaking down barriers to oral health for all Americans. The role of finance. Chicago (IL). April 2012. Available from: [http://www.ada.org/sections/advocacy/pdfs/7170\\_Breaking\\_Down\\_Barriers\\_Role\\_of\\_Finance-FINAL4-26-12.pdf](http://www.ada.org/sections/advocacy/pdfs/7170_Breaking_Down_Barriers_Role_of_Finance-FINAL4-26-12.pdf). Accessed May 9, 2013.

<sup>36</sup> Vujicic M, Nasseh K, Wall T. Dental care utilization declined for adults, increased for children during the past decade in the United States. Health Policy Institute Research Brief. American Dental Association. February 2013. Available from: [http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief\\_0213\\_2.pdf](http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief_0213_2.pdf). Accessed May 9, 2013.

<sup>37</sup> Discepolo K, Kaplan AS. The patient protection and affordable care act: effects on dental care. *NY State Dent J.* 2011;77(5):34-38.

<sup>38</sup> Nasseh K, Vujcic M, O'Dell A. Affordable Care Act expands dental benefits for children but does not address critical access to dental care issues. Health Policy Institute Research Brief. American Dental Association. April 2013. Available from: [http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief\\_0413\\_3.pdf](http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief_0413_3.pdf) . Accessed May 9, 2013.

<sup>39</sup> HealthCare.gov. Report to Congress: National Strategy for Quality Improvement in Health Care. Washington (DC): U.S. Department of Health and Human Services; March 2011. Available from: <http://www.healthcare.gov/news/reports/quality03212011a.html>. Accessed March 25, 2013.

<sup>40</sup> McCormick AP, Abubaker AO, Laskin DM, Gonzales MS, Garland S. Reducing the burden of dental patients on the busy hospital emergency department. *J Oral Maxillofac Surg*. 2013;71(3):475-78.

<sup>41</sup> The Center for Michigan. Success story: filling community cavities in Battle Creek. March 2010. Available from: <http://thecenterformichigan.net/success-story-filling-community-cavities-in-battle-creek/>. Accessed May 9, 2013.

<sup>42</sup> American Dental Association. Reduce health care costs by treating dental disease in the dental practice instead of the ER. Council on Access, Prevention & Interprofessional Relations.

<sup>43</sup> McCormick AP, Abubaker AO, Laskin DM, Gonzales MS, Garland S. Reducing the burden of dental patients on the busy hospital emergency department. *J Oral Maxillofac Surg*. 2013;71(3):475-78.

## Suggested Citation

Wall T, Nasseh K. Dental-related emergency department visits on the increase in the United States. Health Policy Institute Research Brief. American Dental Association. May 2013. Available from: [http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief\\_0513\\_1.pdf](http://www.ada.org/sections/professionalResources/pdfs/HPRCBrief_0513_1.pdf)