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In Search of Dental Care

Two Types of Dentist Shortages Limit Children's Access to Care

Overview

Each year in the United States, tens of millions of children, disproportionately low-income, go without seeing a dentist.[1] This lack of access to dental care is a complex problem fueled by a number of factors, with two different dentist shortages compounding the issue:

- An uneven distribution of dentists nationwide means many areas do not have an adequate supply of these practitioners. As a result, access to care is constrained for people in these communities regardless of income or insurance coverage.
- The relatively small number of dentists who participate in Medicaid means that many low-income people are not receiving dental care.

National standards set by dental and pediatric organizations call for children to visit a dentist every six months.[2] The federal government requires state Medicaid programs to enact their own standards after consulting with these organizations, but new data show that more than 14 million children enrolled in Medicaid did not receive any dental service in 2011.[3] According to the most recent comparison, in 2010, privately insured children were almost 30 percent more likely to receive dental care than those who were publicly insured through Medicaid or other government programs, even though low-income children are almost twice as likely as their wealthier peers to develop

cavities.[4] In 22 states, fewer than half of Medicaid-enrolled children received dental care in 2011.[5]

In 2012, Dr. Louis W. Sullivan, secretary of health and human services under President George H.W. Bush, said, "In a nation obsessed with high-tech medicine, people are not getting preventive care for something as simple as tooth decay." He pointed to the inadequate dental workforce as a driving factor, stating, "The shortage of dental care is going to get only worse."[6]

This issue brief examines the lack of access to dental care, especially for low-income children and families, in the United States. It also explores strategies states are employing—particularly expansion of the dental team by licensing additional types of providers—to address workforce shortages and better serve low-income children.

The Shortage of Dentists

A major factor hindering children and adults' access to dental care is the dentist shortage that exists in many areas of the country. Nearly all states and the District of Columbia only allow dentists to perform many of the most routine procedures, so where dentists are scarce, access to care is severely curtailed. The severity of this workforce gap differs by state and even varies within them. In January 2013, the U.S. Department of Health and Human Services reported that roughly 45 million Americans live in "shortage areas"—regions that have a scarcity of dentists relative to the population.[7] In six states, at least 20 percent of the population has little or no access to dentists.[8] The federal government estimates that eliminating the nation's shortages would require more than 6,000 new dentists.[9]

Data from several states reveal the scope of this workforce shortage:

- **Kansas**: In 2010, 53 of 105 counties had two or fewer dentists. All but one of those counties had dentist shortages, and 13 had no dentists at all.[10]
- **Maine**: In 2013, 15 of 16 counties were confirmed to have areas with dentist shortages.[11] In 2010 and 2011, the state dental board issued 96 new dentist licenses, but 92 others expired or were withdrawn, resulting in a net increase of only four dentists.[12]
- **North Carolina**: The ratio of dentists to population (4.4-to-10,000) in 2009 was considerably below the national average (6.0-to-10,000). Even with a newly opened dental school and increased enrollment at another, experts project that the state's ratio will decline to 4.2-to-10,000 by 2015.[13]

While the challenges these states face are significant, a number of others confront even greater shortages of dentists. Pew rated the severity of dentist shortages based on each state's "underserved"

population – the percentage of residents who live in shortage areas and have a limited expectation of receiving dental care (Table 1).[14]

New dental schools are expected to open in several states over the next few years. If future graduates follow the practice patterns of current dentists—that is, locating in more populated areas and serving primarily privately insured patients or those who pay out of pocket—the access problem will persist.

Additionally, the supply of dentists nationally is likely to shrink in the coming years. According to a 2009 American Dental Association survey, 37 percent of dentists were over the age of 55 and approaching retirement (See Table 2).[15] Between 2010 and 2030, the ADA projects that, despite the addition of new dental schools and possible increase in graduates, the ratio of dentists to Americans will fall in each five-year interval.[16]

TABLE 1:

STATES CONTEND WITH DENTIST SHORTAGES

Ten States with the Worst Dentist Shortages

(See Appendix A for data from the 50 states and the District of Columbia.)

State	% of population that is underserved*
1. MISSISSIPPI	36.3%
2. LOUISIANA	24.4%
3. ALABAMA	24.4%
4. NEW MEXICO	24.2%
5. DELAWARE	21.9%
6. SOUTH CAROLINA	20.6%
7. TENNESSEE	19.8%
8. FLORIDA	18.0%
9. IDAHO	17.5%
10. OREGON	17.3%

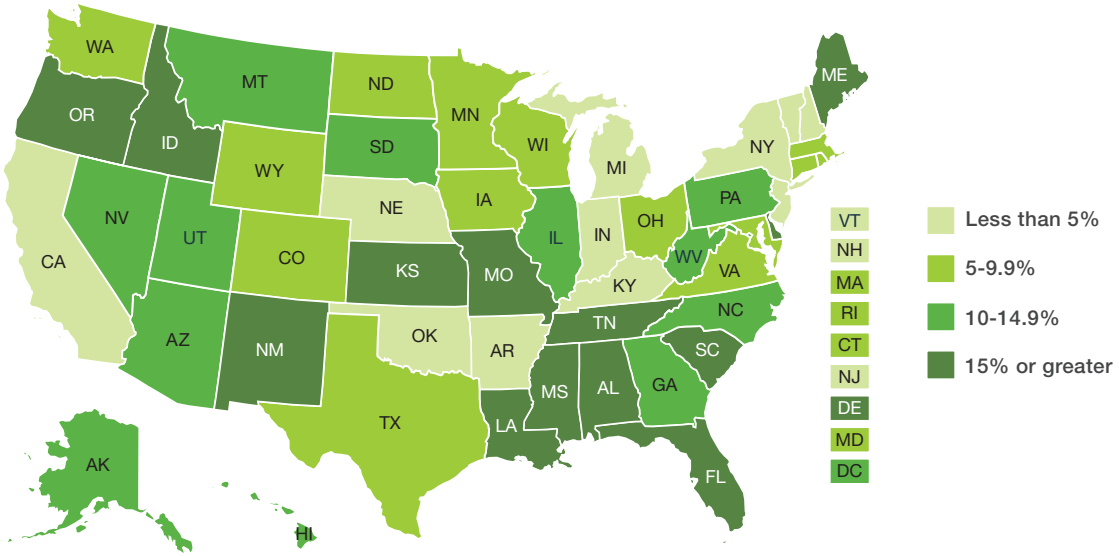
SOURCE: U.S. Department of Health and Human Services, Health Resources and Services Administration, *State Population and Health Professional Shortage Areas Designation Population Statistics*, data as of Jan. 9, 2013. Analysis by The Pew Charitable Trusts.

*The Health Resources Services Administration estimates the underserved population living in a shortage area by multiplying the number of dentists in the area by the ratio 3,000:1 and subtracting this figure from the total population living in the shortage area. Those who are underserved face a high level of difficulty obtaining routine dental services. For the definition of a shortage area, see the endnote 7.

FIGURE 1:

PERCENT OF POPULATION THAT IS UNDERSERVED AND LIVING IN A DENTIST SHORTAGE AREA, 2013

Dentist Shortages Widespread: In 25 States and the District of Columbia, At Least 10 Percent of Residents Do Not Have Adequate Access to a Dentist



SOURCE: United States Department of Health and Human Services, Health Resources and Services Administration (January 9, 2013) Designated HPSA Statistics Report, State Population and Health Professional Shortage Areas Designation Population Statistics, Data as of January 9, 2013. Analysis by The Pew Charitable Trusts.

TABLE 2:

MORE THAN A THIRD OF U.S. DENTISTS ARE NEARING RETIREMENT

Nine States and the District of Columbia Have the Highest Percentage of Dentists Nearing Retirement
(See Appendix A for data from the 50 states and the District of Columbia.)

State	% of dentists older than 55
1. VERMONT	48.7%
2. MAINE	48.4%
3. WYOMING	47.6%
4. DISTRICT OF COLUMBIA	46.4%
5. MISSOURI	45.8%
6. NEW MEXICO	45.5%
7. WISCONSIN	44.8%
8. MONTANA	44.4%
9. TENNESSEE	43.3%
10. NORTH DAKOTA	43.1%

SOURCE: American Dental Association Survey Center, *Distribution of Dentists in the United States By Region and State, 2009* (Chicago: American Dental Association, 2011): 26.

Further complicating the situation, millions of additional children will receive dental insurance through the Affordable Care Act by 2014. The inclusion of pediatric dental benefits in the health reform law will likely benefit a significant portion of the 1 in 4 children (about 19 million) who lack dental coverage.[17] But they will enter a system that is already unable to provide dental services for all the children with coverage.[18]

A Second Shortage: Medicaid Access

Even in areas of the country where dentists are more accessible, a second kind of shortage exists. Medicaid—a federal-state program—provides comprehensive

dental benefits to roughly one-third of U.S. children.[19] In fact, due largely to the federal law requiring that Medicaid extend dental benefits to low-income children, they are more likely to have dental coverage than their higher-income peers.[20] But there are a number of barriers to using Medicaid coverage to access care, and one significant obstacle is that many dentists do not accept publicly insured patients. Dentists cite multiple factors for not participating in Medicaid; chief among them are low reimbursement rates and burdensome administrative procedures.[21]

Data from a number of states illustrate the severity of the shortage of dentists serving Medicaid patients:

- **Colorado:** In 2011, 44 percent of Medicaid-enrolled children did not receive dental care.[22] Only 15 to 20 percent of dentists billed Medicaid for patient care in 2012.[23]
- **Florida:** In 2011, 76 percent of Medicaid-enrolled children did not receive dental care.[24] In 2010, only 15 percent of dentists accepted Medicaid patients.[25]
- **Michigan:** Sixty-two percent of Medicaid-enrolled children did not receive a dental service in 2011.[26] While slightly more than half of dentists participated in the program that year, only 10 percent reported accepting new Medicaid patients.[27]
- **Missouri:** Sixty-three percent of Medicaid-enrolled children did not receive any dental care in 2011.[28] Eleven percent of dentists participate in Medicaid.[29]
- **North Dakota:** In 2011, 66 percent of Medicaid-enrolled children did not receive a dental service.[30] About 20 percent of dentists provide the majority of dental services for Medicaid patients.[31]

Four of these states are among the 10 where low-income children are least likely to receive dental care (See Table 3).

Today's health care safety net is unable to compensate for the uneven distribution of dentists or the scarcity of those accepting Medicaid. Roughly 1 in 4 federally funded health centers in low-income communities reported offering no dental services in 2011.[32]

Each year, many dentists donate time to temporary clinics or other volunteer efforts to provide dental services, including fillings and tooth extractions, to people who struggle to find or afford care.[33] While these contributions are laudable, charity efforts cannot fully address this serious access problem. The American Dental Association notes that "charity is not a health care system, and dentists alone can never successfully bear the burden of providing continuous care to these populations without better support from state and federal governments."[34]

Costs of Emergency Room Dental Care

Without a system of continuous care, children and adults are more likely to end up in hospital emergency rooms with serious dental conditions that could have been prevented.[35] In 2009, more than 830,000 Americans were treated in ERs for toothaches or other preventable dental problems.[36] For many low-income children, emergency rooms are the only option because their families cannot find a dentist who practices in their area or accepts Medicaid.

These hospital visits exacerbate states' financial burdens. A national study found that treating decay-related cases in ERs cost nearly $110 million in 2006 alone.[37] States are saddled with a significant share of these unnecessary expenditures through Medicaid.[38]

For patients, emergency rooms are an expensive treatment option, and care from these facilities usually does not provide lasting relief. Since most emergency rooms are not staffed with dentists and their medical staff are not trained to treat underlying oral health problems, hospitals generally are unable to treat toothaches and other dental ailments effectively.[39]

TABLE 3:

MEDICAID GAP: MANY U.S. DENTISTS DO NOT ACCEPT MEDICAID

Ten States Where Low-Income Children are Least Likely to Receive Dental Care

State	% of Medicaid-enrolled kids who did not receive a dental visit in 2011
1. FLORIDA	75.5
2. WISCONSIN	71.5
3. INDIANA	67.0
4. NORTH DAKOTA	66.4
5. MISSOURI	62.9
6. MAINE	62.4
7. MICHIGAN	61.5
8. MONTANA	59.1
9. CALIFORNIA	58.6
10. NEW YORK	57.3

SOURCE: These percentages are based on data for children ages 1 to 18 who are eligible for the Early and Periodic Screening, Diagnostic and Treatment Benefit. See U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, *Annual EPSDT Participation Report*, Form CMS-416 (State) Fiscal Year: 2011, April 1, 2013. Analysis by The Pew Charitable Trusts.

Policy Solutions

Although a variety of factors shape the access problem, workforce shortages erect barriers to dental care for millions of children. A variety of strategies have been proposed, and in some places implemented, to help address the crisis.

To encourage greater dentist participation in Medicaid, states can increase reimbursement rates enough to cover the actual cost of providing care. And some state Medicaid agencies are streamlining administrative processes to make provider enrollment and billing less burdensome. Both approaches have been found to improve access by making it easier and more cost-effective for dentists to participate in the Medicaid system.[40] Yet neither is sufficient to close the dental access gap.

DENTISTS WEIGH IN ON WORKFORCE EXPANSION

To address the lack of access to dental care, about 15 states are considering legislation to expand the reach of the dental team. These bills include proposals to train hygienists or other existing practitioners to perform more services, to license midlevel providers such as dental therapists, or to use telehealth technology—which enables medical and dental professionals to communicate directly and share patient information, linking practitioners in underserved areas to supervising dentists.

Dental therapists fill a role similar to that of physician's assistants or nurse-practitioners in the medical field. They are trained and licensed to perform preventive care as well as place permanent fillings in teeth and a small number of other routine restorative procedures, allowing dentists to focus on the more complex procedures that only they are educated to do.

In a number of states, dentists actively support such reforms. New Hampshire enacted a law in 2012 permitting dental hygienists with extra training to place temporary fillings. Later that year and in early 2013, legislators began discussing proposals to expand the dental workforce even further. "The distribution of dentists in New Hampshire is unequal to the need," said Robert Keene, a dentist practicing in Etna, NH. "Allowing qualified dental auxiliary personnel to expand the reach, change the cost structure, and increase the treatment capacity of each dental office makes all the sense in the world."[i]

The deans of many dental schools also welcome this trend. A 2012 survey revealed that three-quarters of deans thought that the scope of practice of both hygienists and dental assistants should be significantly expanded. "Over half felt that the future of dentistry should include a dental therapist-type midlevel practitioner," said Dr. Mert Aksu, dean of the University of Detroit Mercy School of Dentistry, which conducted the survey.[ii]

Similarly, Dr. Leon Assael, dean of the University of Minnesota School of Dentistry, offered testimony this year in support of a bill to expand the dental workforce in New Hampshire. He shared his state's experience: "Our Minnesota dental therapists are well-trained, fully understand the limited scope of services they are authorized to provide, and provide high-quality dental services under the supervision of a dentist," Assael wrote. "Indeed they are educated in exactly the same courses that educated dentists with regard to these services."[iii]

Although state dental associations have traditionally opposed the licensing of midlevel providers, some of these organizations are open to this approach or see the introduction of these practitioners as increasingly likely.

(continues on page 8)

DENTISTS WEIGH IN ON WORKFORCE EXPANSION
CONTINUED

In 2011, the California Dental Association, acknowledging the potential to improve children's health, passed a resolution encouraging a study of the safety and effectiveness of midlevel providers to help the underserved. "There is evidence that additional dental providers who provide basic preventive and restorative oral health care to low-income children, in or close to where they live and go to school, have the potential to reduce the disease burden in the population most in need," said a 2011 association report.[iv]

The Washington Dental Association reported in 2012 that support in its state for a bill to license an additional type of provider "continues to grow" among lawmakers, foundations, and other stakeholder groups.[v]

i Robert Keene, email message to The Pew Charitable Trusts (Jan. 11, 2013).

ii Mert Aksu, email message to The Pew Charitable Trusts (Jan. 15, 2013). Mert Aksu, Elizabeth Phillips, and H. Luke Shaefer, "US Dental Schools Deans' Attitudes toward Mid-Level Providers," *Journal of Dental Education* (in press).

iii Leon Assael, dean, University of Minnesota Dental School, testimony for the state Senate Health and Human Services Committee (Feb. 19, 2013).

iv California Dental Association, Phased Strategies for Reducing the Barriers to Dental Care in California (November 2011) edited May 2012, http://www.cda.org/Portals/0/pdfs/access_report.pdf.

v American Dental Association, "WSDA Approves Alternative to Dental Midlevel Provider" (Sept. 19, 2012), http://www.ada.org/news/7620.aspx.

By playing a role similar to nurse-practitioners in the medical field, additional types of dental providers can expand the dental team's reach and help bring care to millions of people who live where dentists are scarce. Midlevel dental professionals also can make it financially feasible—and in some cases profitable—for private-practice dentists to serve more low-income patients.[41] Because their salaries are significantly lower than dentists', alternative providers, who operate under the supervision of a dentist, also offer states a cost-effective approach to address the unmet need for care.[42]

Although this type of practitioner may be relatively new to the United States, dental therapists already offer routine preventive and restorative care (such as filling cavities) in more than 50 countries.[43] Research both internationally and in the United States finds that these dental professionals provide quality, safe care.[44] These findings were reaffirmed by an ADA-commissioned study published in early 2013 and by statements from Oral Health America and the American Association of Public Health Dentistry.[45]

Similarly, a 2011 report about the dental access problem from the Institute of Medicine found no evidence for concerns about the quality of care offered by such practitioners. The institute further recommended that states amend their laws to expand the dental team: "By allowing an array of health care professionals to address basic oral health needs, dentists will be able to dedicate themselves to providing more complex care and treating more patients with complex needs."[46]

To maximize their effect on access in underserved communities, these dental providers can work in rural clinics, low-income schools, and other settings where they are most likely to reach those who struggle to get care. Telehealth technology can link supervising dentists to practitioners who work in rural areas.

Midlevel practitioners already work effectively in two states, expanding access by providing quality, cost-effective care. In Minnesota, dental therapists are employed in a variety of settings, including nonprofit dental clinics, community health centers, and private dental practices. In one nonprofit practice in Minnesota, for example, dentists are paid $75 per hour while dental therapists are paid $35 per hour.[47] The presence of midlevel providers in Alaska has given about 35,000 rural residents regular access to quality dental care that they did not have before.[48]

At the federal level, the Congress approved legislation in 2010 authorizing demonstration grants to states to establish additional provider types. The demonstrations would support research to provide critical information on how different workforce models could be used to improve access. The grant program, however, has not yet been implemented. As states consider adding providers to the dental team, they can work with their members of Congress on funding for this vital research.

Conclusion

For children in need of routine dental care, the picture is sobering. More than 14 million low-income children did not see a dentist in 2011.[49] Many of them live in areas confirmed to have a shortage of dentists or a shortage of dentists who participate in Medicaid. In the next year, millions of additional children will receive coverage through the Affordable Care Act and will enter a dental care system that does not deliver services to all those currently insured, whether through private or public coverage.

Though some states have bolstered Medicaid reimbursement rates and streamlined paperwork requirements, neither of these strategies is likely to significantly improve low-income children's access to care. Unless states take steps to expand the dental workforce, the shortage of providers in many areas of the country and for low-income children will not only persist, but will grow worse in the coming years.

Midlevel providers can extend the reach of the dental team to areas where dentists are scarce. They can also make it more financially feasible to provide care for Medicaid-enrolled children. Working under the supervision of dentists, these practitioners can improve the ability of safety-net systems to reach low-income communities, save states money on emergency room care and other costly alternatives, and ensure that more children and families get the care they urgently need.

Appendix A

	% of Medicaid-enrolled kids who did not receive dental care, 2011[i]	% of dentists over 55, 2009[ii]	% of population that is under-served and living in a dental short-age area, 2013[iii]
ALABAMA	45.9%	37.1%	24.4%
ALASKA	49.7%	40.7%	10.2%
ARIZONA	47.4%	31.9%	14.9%
ARKANSAS	47.8%	39.7%	4.7%
CALIFORNIA	58.6%	32.6%	2.8%
COLORADO	44.2%	36.4%	7.3%
CONNECTICUT	35.6%	42.8%	9.6%
DELAWARE	52.3%	39.2%	21.9%
DISTRICT OF COLUBIA	43.9%	46.4%	11.3%
FLORIDA	75.5%	37.0%	18.0%
GEORGIA	47.3%	33.8%	11.0%
HAWAII	45.4%	36.5%	10.9%
IDAHO	no data submitted	32.2%	17.5%
ILLINOIS	45.6%	36.9%	12.5%
INDIANA	67.0%	38.1%	4.3%
IOWA	53.9%	40.4%	7.8%
KANSAS	54.9%	41.1%	16.2%
KENTUCKY	no data submitted	38.4%	4.8%
LOUISIANA	48.4%	41.5%	24.4%
MAINE	62.4%	48.4%	15.8%
MARYLAND	43.2%	39.2%	5.5%
MASSACHUSETTS	43.1%	36.2%	5.3%
MICHIGAN	61.5%	39.6%	4.5%
MINNESOTA	56.1%	38.7%	7.2%
MISSISSIPPI	49.9%	37.3%	36.3%
MISSOURI	62.9%	45.8%	17.1%
MONTANA	59.1%	44.4%	14.6%
NEBRASKA	48.3%	40.3%	0.1%
NEVADA	55.0%	27.4%	12.4%

NOTES:

i. This figure counts children age 1 to 18 eligible for the Early and Periodic Screening, Diagnostic Treatment benefit. Department of Health and Human Services, Centers for Medicare and Medicaid Services. (2012). Annual EPSDT Participation Report, Form CMS-416 (State) Fiscal Year: 2011, April 1, 2013. Analysis done by The Pew Charitable Trusts.

ii. American Dental Association. (2011) "Distribution of Dentists in the United States by Region and State, 2009," 26. Chicago. Analysis by The Pew Charitable Trusts.

iii. United States Department of Health and Human Services, Health Resources and Services Administration, or HRSA, Jan. 9, 2013. Designated HPSA Statistics Report, State Population and Health Professional Shortage Areas Designation Population Statistics, data as of Jan. 9, 2013. Analysis by The Pew Charitable Trusts.

Appendix A, cont.

	% of Medicaid-enrolled kids who did not receive dental care, 2011[i]	% of dentists over 55, 2009[ii]	% of population that is under-served and living in a dental short-age area, 2013[iii]
NEW HAMPSHIRE	38.9%	42.8%	1.0%
NEW JERSEY	51.0%	36.0%	0.1%
NEW MEXICO	47.6%	45.5%	24.2%
NEW YORK	57.3%	37.1%	4.9%
NORTH CAROLINA	49.4%	35.9%	13.1%
NORTH DAKOTA	66.4%	43.1%	7.5%
OHIO	no data submitted	42.2%	8.3%
OKLAHOMA	49.9%	40.1%	1.5%
OREGON	54.5%	37.1%	17.3%
PENNSYLVANIA	57.3%	42.6%	10.0%
RHODE ISLAND	50.1%	41.7%	9.7%
SOUTH CAROLINA	42.9%	39.9%	20.6%
SOUTH DAKOTA	50.7%	40.4%	12.9%
TENNESSEE	46.8%	43.3%	19.8%
TEXAS	29.6%	36.2%	9.0%
UTAH	50.3%	32.9%	12.6%
VERMONT	39.6%	48.7%	0.0%
VIRGINIA	48.4%	38.1%	8.2%
WASHINGTON	41.8%	37.5%	9.6%
WEST VIRGINIA	48.9%	42.3%	10.2%
WISCONSIN	71.5%	44.8%	9.1%
WYOMING	54.9%	47.6%	6.6%

NOTES:

i. This figure counts children age 1 to 18 eligible for the Early and Periodic Screening, Diagnostic Treatment benefit. Department of Health and Human Services, Centers for Medicare and Medicaid Services. (2012). Annual EPSDT Participation Report, Form CMS-416 (State) Fiscal Year: 2011, April 1, 2013. Analysis done by The Pew Charitable Trusts.

ii. American Dental Association. (2011) "Distribution of Dentists in the United States by Region and State, 2009," 26. Chicago. Analysis by The Pew Charitable Trusts.

iii. United States Department of Health and Human Services, Health Resources and Services Administration, or HRSA, Jan. 9, 2013. Designated HPSA Statistics Report, State Population and Health Professional Shortage Areas Designation Population Statistics, data as of Jan. 9, 2013. Analysis by The Pew Charitable Trusts.

Endnotes

1 U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality. *Medical Expenditure Panel Survey Household Component Data Table 2.2: Percent of Children Age 2-17 with a Dental Visit in the Past Year: United States, 2010*, generated May 09, 2013, http://meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=2010&tableSeries=-1&searchText=dental&searchMethod=1&Action=Search

2 American Academy of Pediatric Dentistry. *Reference Manual v34 No. 6. Guideline on Periodicity of Examination, Preventive Dental Services, Anticipatory Guidance/Counseling; and Oral Treatment for Infants, Children, and Adolescents*, revised 2009 accessed May 24, 2013, http://www.aapd.org/media/Policies_Guidelines/G_Periodicity.pdf; Joseph F. Hagan, Judith S. Shaw, and Paula M. Duncan, eds., *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Third Edition*, (Elk Grove Village, IL: American Academy of Pediatrics, 2008). Oral Health Guidelines located at http://brightfutures.aap.org/pdfs/Guidelines_PDF/8-Promoting_Oral_Health.pdf.

3 This figure counts children ages 1 to 18 eligible for the Early and Periodic Screening, Diagnostic and Treatment Benefit. See U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, *Annual EPSDT Participation Report, Form CMS-416 (National) Fiscal Year: 2011*, April 1, 2013. Analysis by The Pew Charitable Trusts; U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, Early and Periodic Screening, Detection and Treatment Web page (accessed May 24, 2013), http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Early-Periodic-Screening-Diagnosis-and-Treatment.html

4 U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality. *Medical Expenditure Panel Survey Household Component Data Table 2.2: Percent of Children Age 2 - 17 with a Dental Visit in the Past Year: United States, 2010*, generated May 09, 2013, http://meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=2010&tableSeries=-1&searchText=dental&searchMethod=1&Action=Search; Bruce A. Dye, Sylvia Tan, Vincent Smith, Brenda G. Lewis, Laurie K. Barker, Gina Thornton-Evans, et al., "Trends in oral health status: United States, 1988-1994 and 1999-2004," *Vital and health statistics Series 11 (2007)*, 1-92.

5 This figure counts children age 1 to 18 eligible for the Early and Periodic Screening, Diagnostic and Treatment Benefit. See U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, *Annual EPSDT Participation Report, Form CMS-416 (State) Fiscal Year: 2011*, April 1, 2013. Analysis by The Pew Charitable Trusts.

6 Louis W. Sullivan, "Dental Insurance, but No Dentists," *The New York Times*, April 8, 2012, http://www.nytimes.com/2012/04/09/opinion/dental-insurance-but-no-dentists.html?_r=0.

7 In general dental health professional shortage areas, or HPSAs, are based on a dentist-to-population ratio of 1:5,000. There are, however, three types of HPSA designations, each with its own requirements: Geographic Area, Population Groups, and Facilities. Geographic Areas must have a population-to-full-time-equivalent (FTE)-dentist ratio of at least 5,000:1 or have a population-to-FTE dentist ratio of less than 5,000:1 but greater than 4,000:1 and unusually high needs for dental services. Population Groups must have a ratio of the number of people in the population group to the number of dentists practicing in the area and serving the population group of at least 4,000. Facilities must have a ratio of the number of people per year to the number of FTE dentists serving the institution of at least 1,500:1. HRSA estimates the underserved population in a shortage area by multiplying the number of dentists in the area by the ratio 3,000:1 and subtracting this figure from the total population living in the shortage area. See U.S. Department of Health and Human Services, Health Resources and Services Administration, *Designated HPSA Statistics Report, Table 4*, data as of Jan. 9, 2013.

8 Population that has little or no access to dentists is defined as the underserved population living in a dental shortage area. See U.S. Department of Health and Human Services, Health Resources and Services Administration, *State Population and Health Professional Shortage Areas Designation Population Statistics*, Data as of Jan. 9, 2013. Analysis by The Pew Charitable Trusts.

9 U.S. Department of Health and Human Services, Health Resources and Services Administration, *Designated HPSA Statistics Report, Table 4*, Data as of Jan. 9, 2013.

10 Kansas Department of Health and Environment, Bureau of Community Health Systems, Kansas Primary Care Office, *Primary Care Health Professional Underserved Areas Report*, 2013, accessed May 30, 2013, http://www.kdheks.gov/olrh/download/PCUARpt.pdf. Rawlins County reported having one dentist shortly after the publication of this report and was thus removed from the list of counties with no dentist.

11 U.S. Department of Health and Human Services, Health Resources and Services Administration, *Find Shortage Areas: HPSA by State & County*. data as of April 8, 2013.

12 Maine Board of Dental Examiners, email message to The Pew Charitable Trusts, Feb. 1, 2013.

13 D. Gregory Chadwick, "The East Carolina University School of Dental Medicine's Approach to Dental Workforce Education and Reaching Underserved Areas," *North Carolina Medical Journal* 73 (2012): 108-10.

14 The underserved population is calculated by multiplying the number of dentists in the area by the ratio 3,000:1 and subtracting this figure from the total population living in the shortage area. See U.S. Department of Health and Human Services, Health Resources and Services Administration, *Designated HPSA Statistics Report*, data as of Jan. 9, 2013.

15 American Dental Association Survey Center, *Distribution of Dentists in the United States by Region and State, 2009* (Chicago: American Dental Association, 2011), 26.

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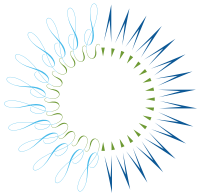

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