

Economic Viability of Dental Therapists

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*Prepared by: Frances M. Kim, DDS, DrPH
for Community Catalyst*

COMMUNITY CATALYST



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Foreword

Oral health is essential to overall health. Yet, millions of Americans go without care because they do not have access to providers or affordable care in their own communities. Our most vulnerable people—those who have low incomes, children, racial and ethnic minorities, older adults and residents of rural communities—have the most difficult time accessing routine and preventive dental care.

Since the landmark Surgeon General’s report on Oral Health¹ was issued in 2000, progress has been made in making preventive care more available, especially with regard to sealants, but the steps forward have been small. The silent epidemic of tooth decay still persists—people still suffer excruciating pain and cannot get the care they need. Dental disease is the number one chronic illness affecting children, and it is more common than asthma. In fact, 60 percent of children ages 5 to 17 have cavities. The numbers are much higher for minority children. Seventy-two percent of American Indian and Alaska Native children ages six to eight have untreated cavities—more than twice the rate of the general population. Thirty-seven percent of non-Hispanic black children and 41 percent of Hispanic children have untreated tooth decay, compared with 25 percent of white children.

Low-income children face significant barriers accessing oral health care. In 2011, more than 51 percent of children enrolled in Medicaid did not receive dental care.² In 2010, the Government Accountability Office reported that the most frequent barrier children enrolled in Medicaid faced in obtaining dental care was finding a dentist who would accept Medicaid payment.³ A study published by the American Academy of Pediatrics showed that children enrolled in Medicaid were 18 times less likely to receive a dental appointment than children with private insurance.⁴

According to the Pew Center on The States⁵, in 2009 there were more than 830,000 visits to emergency rooms across the country for

1. US Department of Health and Human Services (2000). Oral health in America: A report of the surgeon general. Rockville, MD: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health.
2. United States. Dept. of Health and Human Services. & Centers for Medicare and Medicaid Services. (2012). Annual EPSDT Participation Report, Form CMS-416 (State) Fiscal Year: 2011, April, 2012.
3. United States Government. Government Accountability Office. *ORAL HEALTH Efforts Under Way to Improve Children’s Access to Dental Services, but Sustained Attention Needed to Address Ongoing Concerns*. Washington, D.C.: , 2010. Print.
4. Bisgaier, J, DB Cutts, BL Edelstein, and KV Rhodes. “Disparities in child access to emergency care for acute oral injury.” *Pediatrics*. 127.6 (2011): e1428-35. Print.
5. Pew Children’s Dental Campaign (2012). A costly dental destination: Hospital care means states pay dearly. Washington, DC: Pew Center on the States.

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preventable dental conditions—a 16 percent increase since 2006. Overall, dental related trips to the emergency room cost tens of millions of dollars each year in every state. In Florida alone in 2010 there were more than 115,000 hospital ER visits for dental problems, resulting in more than \$88 million in charges.

As the Institute of Medicine's (IOM) most recent report on oral health care so eloquently stated: the current dental delivery system is broken and does not meet the needs of roughly a third of the country's inhabitants. The report, *Improving Access to Oral Health Care for Vulnerable and Underserved Populations*⁶, recommends that states explore all avenues to expand access to care, including amending state practice laws to enable new providers.

As a clinical provider who has worked on the ground with mid-level dental providers, I can tell you the IOM is right in its recommendations and every state should enable mid-level dental providers, such as dental therapists, to practice. The findings included in this report offer concrete evidence as to why it makes sense to train and deploy dental therapists. They are cost effective, they enable dental practices to expand the number of people they serve, they allow the dentist time to provide more complicated care, and they focus on providing routine, preventive care. Dental disease is preventable if people have access to routine care.

In the U.S., dental therapists are currently practicing in Alaska and Minnesota. In Alaska, dental therapists were added to the dental team as part of a tribal-led approach to solving their community's oral health crisis. The Alaska Native Tribal Health Consortium implemented a rigorous training program and then deployed dental therapists to tribes and communities struggling with access to dental care. In Minnesota, the state legislature changed scope of practice laws to enable dental therapists to practice, citing significant unmet oral health needs and dental provider shortages. Dental therapists are now employed in a variety of practice settings—private practice, Federally Qualified Community Health Centers, hospitals and non-profit dental service organizations.

Dental therapists are well-established in more than 50 countries. Numerous studies—most recently, *A Review of the Global Literature on Dental Therapists*⁷—have documented the high quality of care they provide. This report shows that here in the U.S. they are reaching the people most in need, providing preventive services, and enabling practices to see more patients because they are cost-effective to employ.

The report assesses the work of dental therapists in both Alaska and Minnesota and details the percentage of time spent on different categories of procedures, the characteristics of the population base they serve, and the overall cost to the practice of employing dental therapists.

The findings confirm my own 20 years' experience with dental therapists in Canada. They are treating underserved populations that are not being served by the traditional dental delivery system in the U.S. The report shows dental therapists have increased access to care for 40,000 Alaska Natives. In Minnesota, 78 percent of the patients being treated by dental therapists are enrolled in Medicaid.

The report also shows the majority of care dental therapists provide is preventive and routine. Restorative care, such as fillings, represents a quarter of their work. Dental

6. Institute of Medicine (2011). *Improving access to oral health care for vulnerable and underserved populations*. Washington, DC: The National Academies Press.

7. Nash, D.A., Friedman, J.W., Kavita, M.R., & Robinson, P.G. (2012). *A review of the global literature on dental therapists*. Battle Creek, MI: W.K. Kellogg Foundation.

therapists are cost-effective and their salaries account for less than 30 percent of the revenue they generate.

Dental therapists are showing great promise in the U.S. and this research is a crucial early step in understanding their impact in a real-life setting, in real time. Moving forward, it would be wise for states to consider all possible solutions and to continue to evaluate dental therapists' work so that millions do not have to continue to go without needed dental care.

Todd Hartsfield, DDS

Section I. Background

Introduction

Limited data is available regarding the economic viability of including new dental team members. Currently two states, Alaska and Minnesota, employ dental therapists in dental clinics. In order to address the oral health needs in Alaska's Native population, the Alaska Native Tribal Health Consortium (ANTHC), along with partner tribal health organizations, developed the Alaska Dental Health Aide Initiative. Part of the initiative included the use of Dental Health Aide Therapists (DHAT) with two years of post-high school education in a limited scope of care. The scope of practice for these DHATs is set by federal regulations which delineate the types of procedures that may be carried out under the supervision of a dentist. Minnesota became the first state to establish an avenue to license dental therapists (DT) and advanced dental therapists (ADT) in 2009. DTs and ADTs work as part of the dental team and under the supervision of a dentist. Practice settings include community and public health clinics serving low-income, uninsured and underserved populations; in dental health professional shortage areas; Head Start programs; nursing homes; rural communities; and a private dental group. DTs complete a three to four year Bachelor's dental therapy degree plus a demonstration of competency and licensure exams. ADTs are licensed DTs who have completed a Master's advanced dental therapy program, 2,000 hours of clinical practice under direct and indirect supervision of a dentist, and have passed the Minnesota Board of Dentistry certification exam. The primary difference between DTs and ADTs is the scope of practice and the level of supervision under which they can perform procedures. The first class of Minnesota dental therapists graduated in 2011.

Aim

The aim of this report is:

1. to provide an overview of the types of procedures carried out and revenue (total net reimbursement) generated by DHATs, DTs and ADTs
2. to examine the economic viability of DHATs, DTs and ADTs as part of the dental team

Methodology

Data regarding productivity of DHATs, DTs and ADTs was obtained from four employers in Alaska and Minnesota. The data request included the amount of time employed as well as full-time equivalent (FTE) status, average salary for provider, clinical setting where providers practiced (e.g. urban, rural, other), information on the procedures and amount of revenue generated by each procedure, and the age group of and payor types (e.g. Medicaid, private insurance, other) for patients seen by the therapists. The DHATs, DTs and ADTs are employed by non-profit organizations as well as a private dental group that serves a wide range of patients. The clinical settings in which they practice are in urban areas designated as Dental Health Professional Shortage areas and urban and rural areas in low-income communities. The majority of patients seen by DHATs, DTs and ADTs were publically insured and were generally children less than 21 years old.

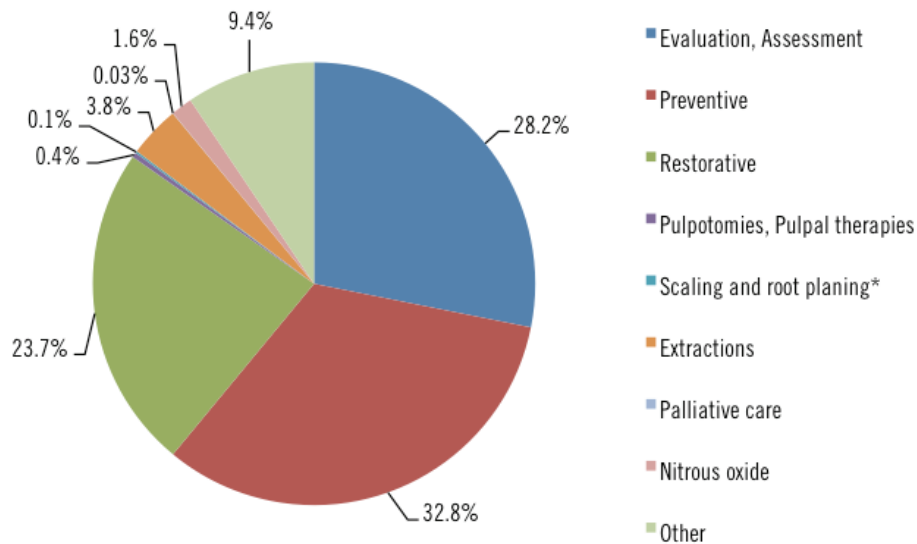
Data were available from August 2011 through December 2012 for eight DHATs, one of whom is a registered dental hygienist (8.0 FTEs); and two ADTs and four DTs (5.3 FTEs), two of whom are dually licensed dental hygienists/DTs who completed a Master's degree program and are currently working towards their ADT license. The dental procedures and services carried out by the DHATs, DTs and ADTs, as well as the amount of revenue generated, were combined to look at distributions of procedures and services.

The economic viability of DHATs, DTs and ADTs as part of the dental team was assessed separately. DHATs, DTs and ADTs were considered to be economically viable if the total net revenues from their practice exceeded the total cost of providing care. The FTE status, average hourly wage, and the amount of time employed for the DTs, ADTs and the DHATs were used to estimate the salaries for all of the providers (referred to as combined salaries). The percent that the combined salaries made up out of all the revenue generated was an indication of the economic viability of DHATs, DTs and ADTs. Since data on overhead costs were not available, an assumption was made that after salaries were paid to DHATs, DTs, and ADTs, the remaining revenue would include costs such as benefits paid to DHATs, DTs and ADTs, salaries and benefits for other clinic and office staff, and dentist's time for supervision of DHATs, DTs and ADTs. Additional expenses incurred by non-profit organizations, such as administrative costs, program-related costs, fundraising or lobbying would also be covered by the remaining revenue.

Section II of the reports presents the distribution of various dental services the DHATs, DTs and ADTs performed as well as the revenue generated from these services. Section III examines the economic viability of the DHATs, DTs and ADTs. Section IV highlights the main points of the report.

Section II. Distribution of dental procedures performed by Dental Therapists, Advanced Dental Therapists, and Dental Health Aide Therapists

Figure 1a. Distribution of types of procedures (N=38,476)



The distribution of the types of procedures performed by DHATs, DTs and ADTs are shown in Figure 1a. The majority of the total procedures performed by DHATs, DTs and ADTs were related to prevention⁸ (32.8 percent), evaluation and assessment⁹ (28.2 percent). Restorative care was 23.7 percent of all dental procedures. This suggests DHATs, DTs and ADTs not only provide definitive treatment (restorations) but also provide access to evaluation of oral health needs, early intervention and prevention. Other procedures included extractions (3.8 percent); pulpotomies and pulpal therapies (0.4 percent); nitrous oxide administration (1.6 percent); and palliative care¹⁰ (0.03 percent). Scaling and root planing (0.1 percent) procedures are under the scope of practice for DHATs and DTs who are dually licensed hygienists. Other procedures (9.4 percent) included those that generated revenue and those procedures that did not generate revenue¹¹.

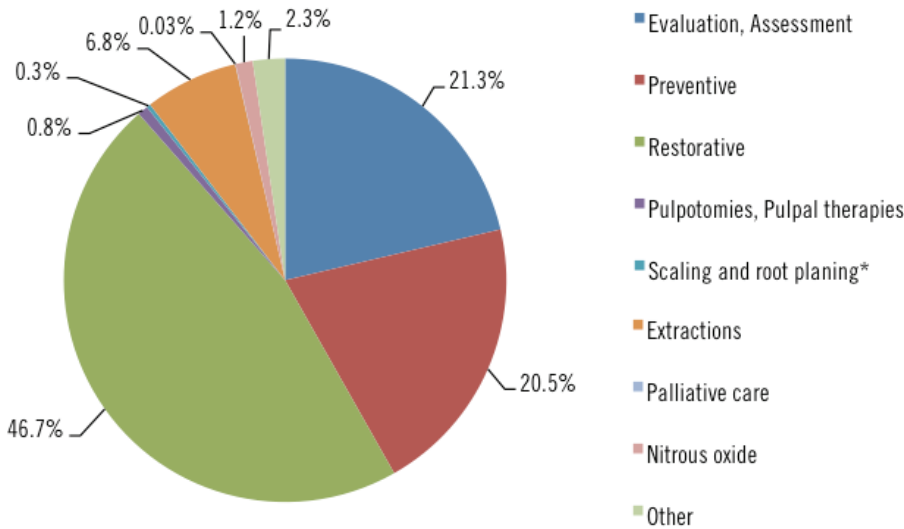
8. Preventive procedures: fluoride treatments for children and adults, fluoride varnish application, sealants, prophylaxis (DTs who are dually licensed hygienists and DHATs), placement and removal of space maintainers, preventive resin restorations, and education

9. Evaluation and assessment procedures: clinical oral examinations, radiographs, and pulp vitality tests

10. Palliative care: care provided to alleviate pain from a dental condition until definitive treatment can be rendered

11. Revenue-generating procedures, such as local anesthesia not in conjunction with operative or surgical procedures, medicaments, behavior management, and application of desensitizing resin on root surface, were 3.9 percent of all other procedures; non-revenue generating procedures, such as local anesthesia in conjunction with operative or surgical procedures, referrals, and Head Start exams, were 5.5 percent of all other procedures

Figure 1b. Distribution of revenue generated for dental procedures (N=\$3,066,253)



The distribution for the revenue generated for procedures performed by DHATs, DTs and ADTs are shown in Figure 1b. The majority, approximately 89 percent, of revenue generated was from preventive procedures (20.5 percent), evaluation and assessment (21.3 percent), and restorations (46.7 percent). Remaining revenue came from extractions (6.8 percent); pulpotomies and pulpal therapies (0.8 percent); nitrous oxide administration (1.2 percent); palliative care (0.03 percent); and scaling and root planing (0.3 percent). Scaling and root planing is under the scope of practice for DHATs and DTs who are dually licensed hygienists. The other category (2.3 percent) included procedures that generated revenue.

Figure 2a. Distribution of evaluation and assessment procedures (N=10,835)

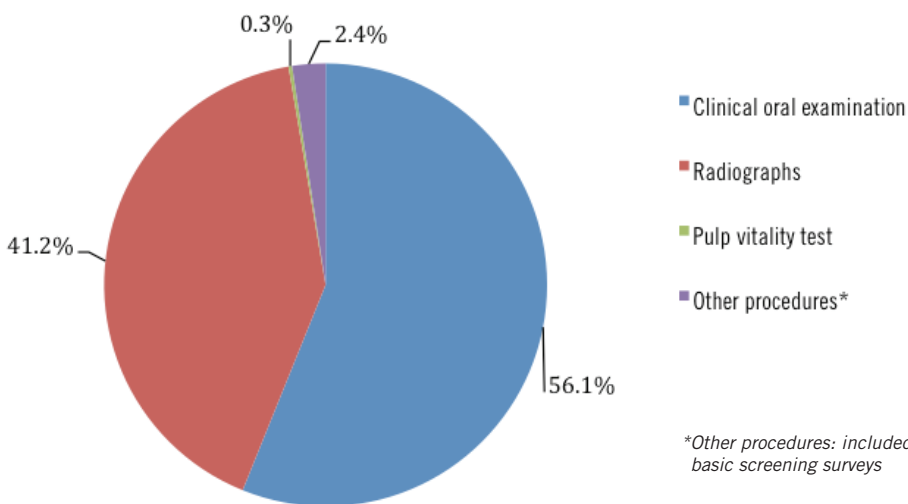


Figure 2a shows the percentages for various procedures related to evaluation and assessment performed by DHATs, DTs and ADTs. Approximately 56 percent of these were clinical oral examinations. Radiographs (41.2 percent), pulp vitality testing (0.3 percent)

and other procedures (2.4 percent) contributed to the remainder of evaluation and assessment procedures. Other procedures were those related to basic screening surveys and did not generate revenue (see Figure 2b).

Figure 2b. Distribution of revenue generated for diagnostic procedures (N=\$653,634)

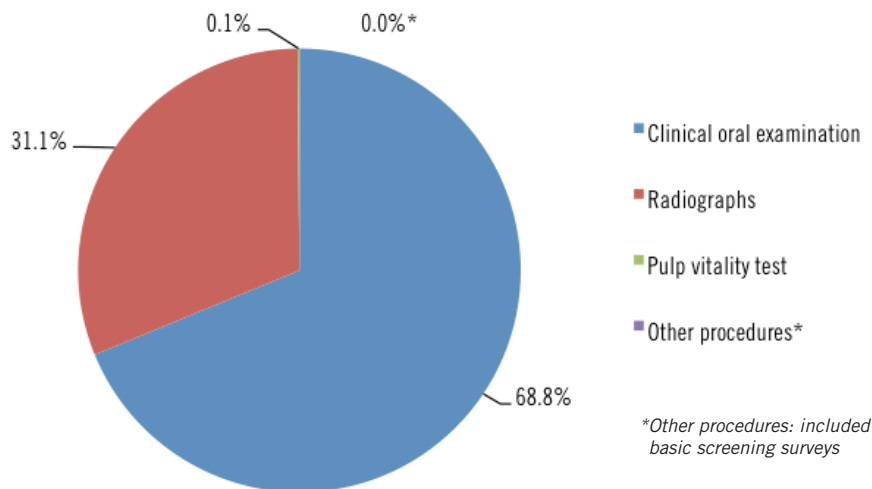


Figure 2b shows the distribution of revenue generated for various evaluation and assessment procedures performed by DHATs, DTs and ADTs. The majority of revenue was generated by clinical oral examinations (68.8 percent). Radiographs (31.1 percent) and pulp vitality tests (0.1 percent) contributed to the remaining revenue. Other procedures were those related to basic screening surveys and did not generate revenue.

Figure 3a. Distribution of preventive procedures (N=12,637)

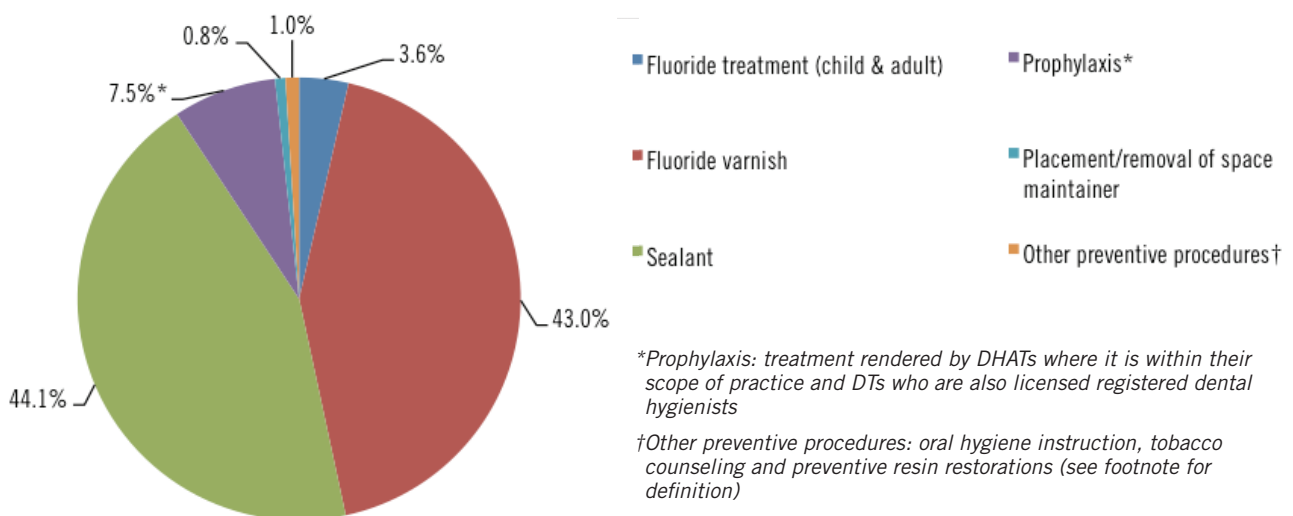
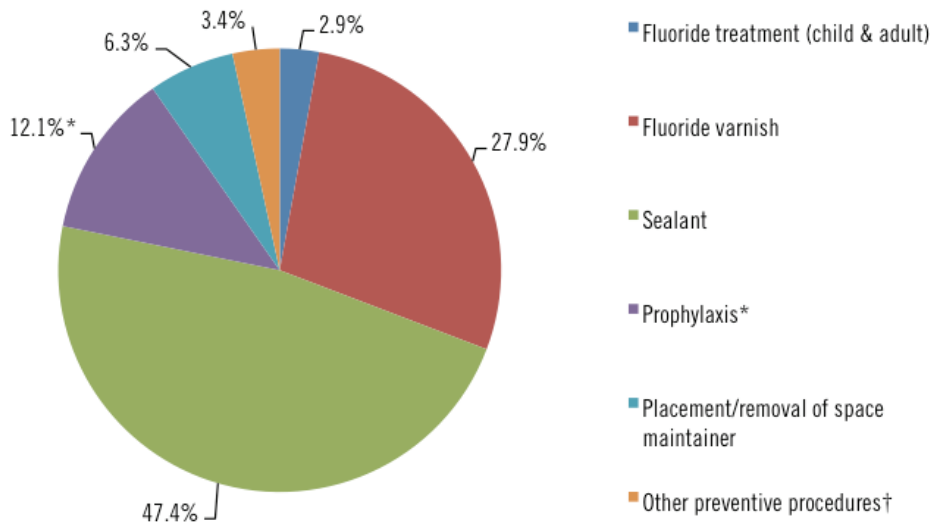


Figure 3a shows the distribution of preventive procedures performed by DHATs, DTs and ADTs. Fluoride therapies (topical fluoride and fluoride varnish) comprised approximately 47 percent of all preventive procedures. Other preventive procedures included sealants

(44.1 percent), and placement and removal of space maintainers (0.8 percent). Prophylaxis procedures (7.5%) were carried out by DTs who are also licensed registered dental hygienist and DHATs, where prophylaxis is part of the scope of practice. Other preventive procedures (1.0 percent) included oral hygiene instruction, tobacco counseling and preventive resin restorations in moderate to high caries risk patients¹².

Figure 3b. Distribution of revenue generated for preventive procedures (N=\$627,976)



*Prophylaxis: treatment rendered by DHATs where it is within their scope of practice and DTs who are also licensed registers

†Other preventive procedures: oral hygiene instruction, tobacco counseling and preventive resin restorations (see footnote for definition)

Figure 3b shows distribution of revenue generated for preventive procedures performed by DHATs, DTs and ADTs. Sealants generated the greatest percentage of revenue for all preventive procedures (47.4 percent), followed by fluoride varnishes (27.9 percent), and placement and removal of space maintainers (6.3 percent), fluoride treatments (2.9 percent). Prophylaxis procedures (12.1 percent) were carried out by DTs who are also licensed registered dental hygienist and DHATs, where prophylaxis is part of the scope of practice. Other procedures which included oral hygiene instruction, tobacco counseling and preventive resin restorations¹³ were 3.4 percent of revenue generated for prevention.

12. Preventive resin restorations (PRR) are placed in permanent teeth. It is a conservative restoration of active cavitated lesion in pit or fissure that does not extend into dentin and includes the placement of sealant in any radiating non-carious fissure or pits

13. Preventive resin restorations (PRR) are placed in permanent teeth. It is a conservative restoration of active cavitated lesion in pit or fissure that does not extend into dentin and includes the placement of sealant in any radiating non-carious fissure or pits

Figure 4a.
Distribution of restorative procedures (N=9,122)

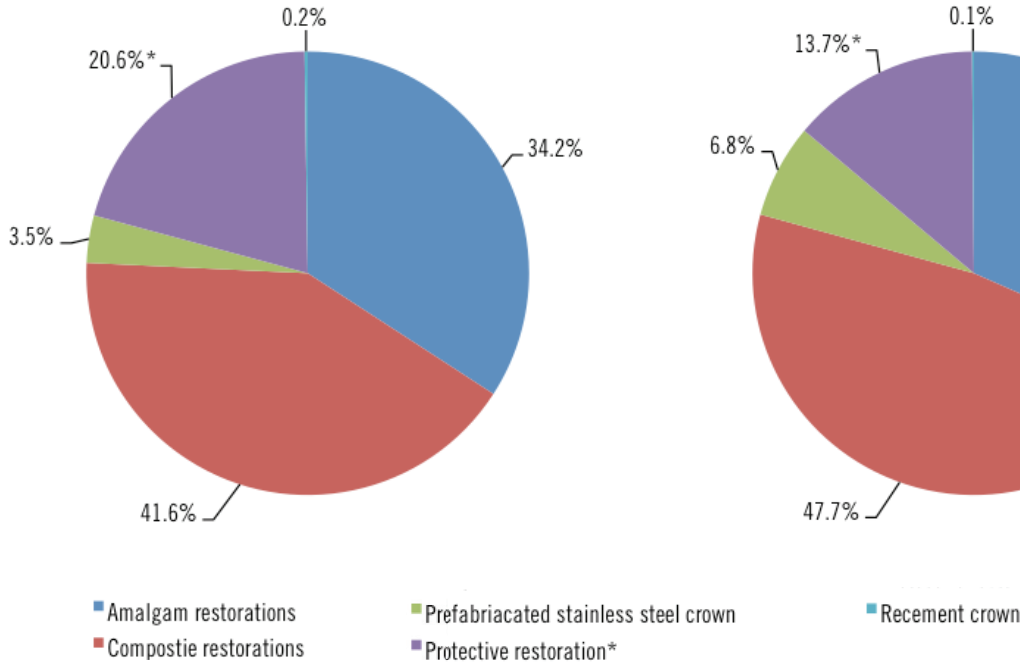
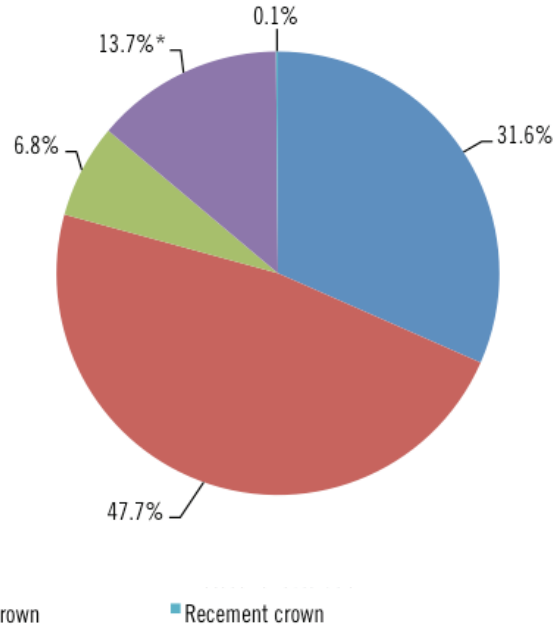


Figure 4b.
Distribution of revenue generated for restorative procedures (N=\$1,431,985)



**Protective restorations: (formerly sedative filling) direct placement of a temporary restorative material to protect tooth and/or tissue form. This procedure may be used to relieve pain, promote healing, or prevent further deterioration. Not to be used for endodontic access closure, or as a base or liner under a restoration.*

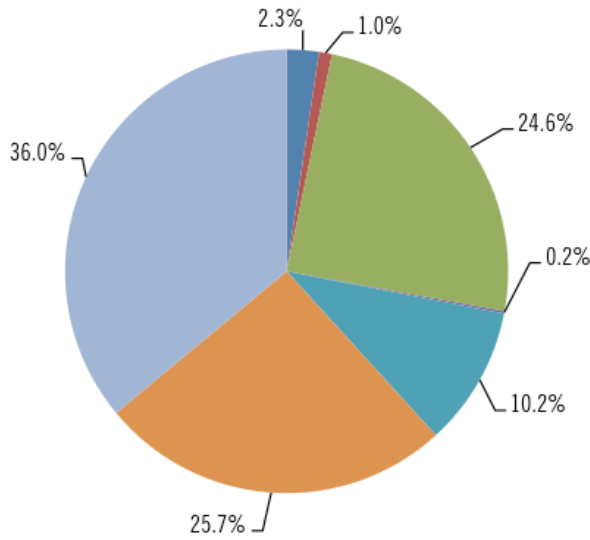
Figure 4a shows the distribution for various restorative procedures performed by DHATs, DTs and ADTs. The majority of restorations placed were amalgam and composite restorations (34.5 percent and 41.1 percent respectively). The remaining restorative procedures were protective restorations¹⁴ (20.6 percent), stainless steel crowns on primary and permanent teeth (3.5 percent) and recementing of crowns (0.2 percent).

Figure 4b shows the revenue generated from restorative procedures. Revenue generated from composite restorations was 47.7 percent. Amalgam restorations generated 31.6 percent of all revenue for restorative procedures. Protective restorations¹⁵ (13.7 percent), prefabricated stainless steel crowns (6.8 percent), and recementing of crowns (0.1 percent) made up the remaining revenue from restorations.

14. Protective restorations: (formerly sedative filling) direct placement of a temporary restorative material to protect tooth and/or tissue form. This procedure may be used to relieve pain, promote healing, or prevent further deterioration. Not to be used for endodontic access closure, or as a base or liner under a restoration.

15. Protective restorations: (formerly sedative filling) direct placement of a temporary restorative material to protect tooth and/or tissue form. This procedure may be used to relieve pain, promote healing, or prevent further deterioration. Not to be used for endodontic access closure, or as a base or liner under a restoration.

Figure 5a.
Distribution other dental procedures (N=5,882)



- Pulpotomies and pulpal therapies
- Extractions
- Nitrous oxide
- Other procedure (non-revenue generating)
- Scaling and root planing*
- Palliative care
- Other procedure (revenue generating)

*Scaling and root planing: treatment rendered by DHATs where it is within their scope of practice and DTs who are also licensed registered dental hygienists.

Figure 5a shows the distribution for other dental procedures performed by DHATs, DTs and ADTs. These included extractions (24.6 percent); pulpotomies and pulpal therapies (2.3 percent); palliative care¹⁶ (0.2 percent); nitrous oxide administration (10.2 percent); and scaling and root planing (1.0 percent). Scaling and root planing are carried out by DTs who are also licensed registered dental hygienist and DHATs, where it is part of the scope of practice. Other procedures included other dental duties for DHATs, DTs and ADTs.

Figure 5b shows the distribution of revenue generated for other dental procedures performed by DHATs, DTs and ADTs. Revenue generated from extractions was 59.3 percent of all other dental procedures. The remaining revenue was from pulpotomies and pulpal therapies (6.6 percent), nitrous oxide (10.9 percent), palliative care¹⁷ (0.3 percent); and scaling and root planing (2.5 percent) carried out by DTs who are also licensed registered dental hygienist, thus practicing under their hygiene license and DHATs. Other procedures delegated to DHATs, DTs and ADTs generated 20.4 percent of revenue for all other dental procedures within the scope of practice.

16. Palliative care: care provided to alleviate pain from a dental condition until definitive treatment can be rendered

17. Palliative care: care provided to alleviate pain from a dental condition until definitive treatment can be rendered

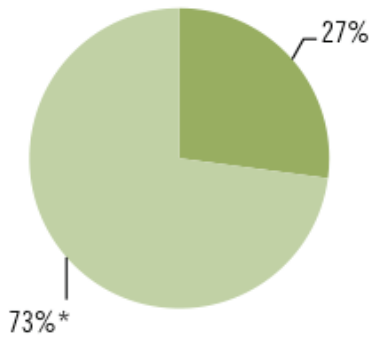
Section III. Assessment of Economic Viability

To assess the economic viability, i.e. the total net revenue exceeding the total cost of providing care, the time of employment, full-time equivalent (FTE) and estimated hourly wage were taken into account to estimate the combined salaries of DHATs, DTs and ADTs. Additional costs were assumed to include benefits paid to DHATs, DTs and ADTs, salaries and benefits for other clinic and office staff, and dentist’s time for supervision of DHATs, DTs and ADTs and other expenses such as administrative costs, program-related costs, fundraising or lobbying generally incurred by non-profit organizations.

For the DHATs, the combined salaries were 27 percent of the total revenue they generated and for the DTs and ADTs salaries were 29 percent of the total revenue generated, strongly suggesting economic viability for practices that employ them (Figure 6). Although data on overhead and additional costs were not available, even if it was assumed that these costs were 60 percent^{18 19} of the production generated by DHATs and DTs there would be 13 percent and 11 percent of revenue remaining, respectively.

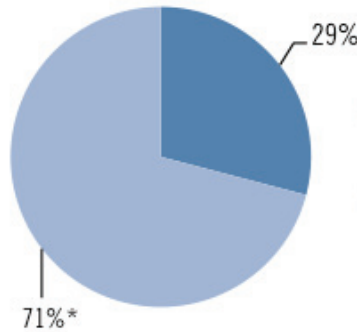
Figure 6. Total Revenue Generated by Dental Health Aide Therapists, Advanced Dental Therapists and Dental Therapists

Dental Health Aide Therapists



- Combined salaries of DHATs
- Remaining revenue*

Advanced Dental Therapists and Dental Therapists



- Combined salaries of DTs
- Remaining revenue*

18. Costs above the salaries of DTs, ADTs, and DHATs were estimated to be 60 percent based on discussions with several of the participating practices.

19. Levin R. Part 2, 2009 Dental Economics/Levin Group Practice Survey. Dent Econ. 2009 Nov;99(11):38-43.

Section IV. Summary

- The table below shows the distribution of procedures and revenue generated by dental therapists (DTs) and dental health aide therapists (DHATs). More than 50 percent of the total number of procedures performed by DHATs, DTs and ADTs were preventive and evaluative in nature. This suggests that these providers not only provide definitive treatment (restorations) but also provide access to evaluation of oral health needs, early intervention and prevention.

| | Percent of total number of procedures | Percent of total amount of revenue generated |
|-------------------------------|---------------------------------------|--|
| Exams, Radiographs, Pulp test | 28.2% | 21.3% |
| Preventive | 32.8% | 20.5% |
| Restorative | 23.7% | 46.7% |
| Pulpotomies, Pulpal therapies | 0.4% | 0.8% |
| Scaling and root planing* | 0.1% | 0.3% |
| Extractions | 3.8% | 6.8% |
| Palliative care | 0.03% | 0.03% |
| Nitrous oxide | 1.6% | 1.2% |
| Other revenue generating | 3.9% | 2.3% |
| Other non-revenue generating† | 5.5% | 0.0% |
| Total | 100% | 100% |

*Scaling and root planing: treatment rendered by DHATs, where it is within their scope of practice, and DTs who are also licensed registered dental hygienists.

- The combined salaries for the Alaska DHATs was 27 percent of the total revenue they generated strongly suggesting economic viability. Approximately, 66 percent of patients seen by DHATs were less than 21 years old. The patient population served by practicing DHATs is American Indian and Alaska Native people living in mostly isolated villages. This population has many barriers to accessing care including geography, harsh weather and lack of providers. With the addition of DHAT to the dental team, more than 40,000 people who previously only had intermittent dental care now have improved access to care from a DHAT living in their area.²⁰
- The combined salaries for the Minnesota DT and ADT was 29 percent of the total revenue they generated strongly suggesting economic viability for practices that employ them. Approximately two-thirds (67 percent) of patients seen by DTs were less than 21 years old. Additionally, the majority (78 percent) of the patients had public insurance. It is noteworthy that even though the practices are serving a large majority of patients who are covered under public insurance, which pays relatively lower rates, the practices are experiencing positive financial performance.
- The practice of DTs and ADTs in Minnesota is relatively new and should continue to be assessed as their practice matures. As stated in the legislation, the Minnesota Board of Dentistry will be evaluating the impact of therapists on delivery of dental services and access to care.

20. Mary Williard, personal communication

- Future studies to further assess cost-effectiveness of dental therapists (DTs, ADTs, and DHATS) could include examining a practice's production before and after the addition of therapists to the dental team. Additionally, the distribution of procedures among dental therapists and dentists could be evaluated.
- Given that DHATs, DTs, and ADTs are productive in the various clinic settings, there is the potential that they can be cost-effective members of dental teams and improve access to care, especially for traditionally hard to reach and underserved populations.

Author Bio:

Frances Kim

Background and Experience

Frances Kim, DDS, DrPH, received her BA from Bryn Mawr College in 1993 and her dental degree from Baltimore College of Dental Surgery Dental School, University of Maryland in 2000. After a one-year General Practice Residency at the Brigham and Women's Hospital, she received her Masters in Public Health with a concentration in Family and Community Health (2002) and Doctorate in Public Health in Epidemiology (2007) from the Harvard School of Public Health. Dr. Kim completed a dental public health residency at Harvard School of Dental Medicine in 2007. She is a Diplomate of the American Board of Dental Public Health.

During her residency, Dr. Kim practiced general dentistry for Everett Board of Health and Cambridge Health Alliance and organized and conducted various oral health needs assessments in school-aged children.

After the completion of her training, Dr. Kim spent some time at the National Institute of Dental and Craniofacial Research in the Center for Clinical Research and worked as a research assistant for the Remediation Monitor for Medicaid Reform in Massachusetts. Currently, she is involved in fluoride and osteosarcoma research.

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