Dental Therapists in New Zealand: What the Evidence Shows

Correction: *An earlier version of this brief used mislabeled data from a 2012 report produced by the U.S. Centers for Disease Control and Prevention, or CDC, to compare dental health outcomes for children in the United States and New Zealand. This brief and the original CDC source report have been revised and corrected.*

Overview

Dental decay remains the most common chronic childhood disease in the United States.[1] More than 14.5 million low-income children went without seeing a dentist in 2011, due in large part to a shortage of dentists in many places across the nation.[2] With roughly 45 million Americans living in these areas, a number of states are considering expanding the dental workforce to reach underserved communities.[3] These initiatives include proposals to train and license additional types of midlevel providers, such as dental therapists, or training existing professionals, such as hygienists, to perform a broader range of procedures, and to deploy them in areas without sufficient numbers of dentists.

Using dental therapists—similar to nurse practitioners in the medical field—to increase access to care is hardly new. These providers offer preventive care and also perform a limited number of routine restorative treatments, such as filling cavities. Dental therapists are deployed in more than 50 countries and have worked for decades in Canada, Great Britain, Australia, and New Zealand.[4] More recently, two initiatives to expand the dental workforce were implemented in the United States. Dental health aide therapists have operated in Alaska since 2005, and similar providers began practicing in Minnesota in 2011.[5] Other states are considering authorizing their use.

In 2012, a review of more than 1,100 studies showed that dental therapists across the globe offer quality care.[6] Further, nothing in the scientific literature notes any problems with the care these professionals provide.

New Zealand has employed dental therapists since 1921, longer than any other country. Working mainly in primary schools, these providers contribute to a high level of access to care for that nation's elementary school-age children.[7] This brief provides an overview of New Zealand's program and offers insights for U.S. policymakers about how midlevel providers can increase children's access to dental care through a school-based system that expands the dental team by utilizing dental therapists.

History of New Zealand's Dental Therapists

Public health officials in New Zealand first noted high levels of untreated tooth decay among children in the early 20th century. The poor oral health of World War I recruits convinced the government and the dental profession of the need for more effective dental care, particularly for children.[8] These findings helped lead to the creation of the School Dental Service (now the Community Oral Health Service), a program that trained dental nurses to offer routine preventive and restorative services in schools for children up to age 13.[9]

These dental nurses were first deployed in New Zealand in 1921 and initially worked exclusively within schools under the supervision of a dentist. These providers—known today as dental therapists—are authorized to perform a small set of procedures, particularly cleanings, fillings, and application of dental sealants, without a dentist being on-site or examining the patient first, but a dentist is on call to consult if needed. This system ensures that children receive care without the delays that can result from requiring that a dentist be present.

Today, dental therapists provide care for children from infancy through age 18; they must have a written agreement with a dentist that allows them to seek advice and refer patients with needs outside their scope of practice. They may practice in both public and private settings, but most continue to work in elementary schools.[10]

Training Criteria

As the profession of dentistry has modernized, the training and education of dental therapists in New Zealand has evolved. Today's curriculum is a three-year program combining dental hygiene and dental therapy,[11] and graduates can register with the Dental Council of New Zealand as therapists, hygienists, or both. With this training, these providers can assess and clean teeth, diagnose common oral health problems, educate patients on decay prevention, drill and fill decayed teeth, and extract primary (baby) teeth.[12]

Children's Dental Care Access in New Zealand

All children, from birth through age 18, can receive publicly funded dental care from dental therapists.[13] In 2011, 843 licensed therapists provided services across the country.[14] Between infancy and age 13, children receive care within the Community Oral Health Service. Adolescents are cared for mostly by private dentists, and no publicly funded universal dental coverage is offered for adults.

Dental therapists work mainly in elementary school-based clinics. According to 2009 data, 90 percent of elementary school-age children had a dental visit during the previous year.[15] In 2009, 81 percent of New Zealand children in the 2-17 age group received

TABLE 1

ACCESS TO DENTAL CARE: NEW ZEALAND AND THE UNITED STATES

	New Zealand	United States
Universal dental coverage for children	YES	NO
Universal dental coverage for adults	NO	NO
School-based dental programs	Serving most elementary schools (preventive and restorative services)	Serving some schools (mostly limited to preventive services)
Percentage of children ages 2-4 who saw a dental care provider in the last year	60% (2009)[i]	31% (2010)[ii]
Percentage of children ages 2-17 who saw a dental care provider in the last year	81% (2009)[iii]	51% (2010)[iv]

i. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010. Chapter 7, Table 93.
ii. Agency for Healthcare Research and Quality. Table 2.2: Percent of Children Age 2-17 with a Dental Visit in the Past Year: United States, 2010. Medical Expenditure Panel Survey Household Component Data. Generated May 9, 2013. meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=2010&tableSeries=-1&searchText=dental&searchMethod=1&Action=Search.
iii. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010. Chapter 7, Table 93.
iv. Agency for Healthcare Research and Quality, Table 2.2: Percent of Children Age 2-17 with a Dental Visit in the Past Year: United States, 2010. Medical Expenditure Panel Survey Household Component Data. Generated May 9, 2013. meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=2010&tableSeries=-1&searchText=dental&searchMethod=1&Action=Search.

dental care during the previous year, compared with only 51 percent of U.S. children in the identical age group in 2010.[16]

Among low-income children, differences in access to dental care are even greater. In 2009, about 72 percent of New Zealand's poorest 2- to 17-year-olds had a dental visit during the previous year.[17] In contrast, in 2010 the figure was only 39 percent for U.S. children living at or below the poverty line.[18] Despite the fact that Medicaid covers many low-income children in the United States, access to dental insurance does not necessarily equal access to care. Although both countries continue to face access disparities across socioeconomic groups, data suggest that in New Zealand, a school-based delivery system using dental therapists plays a role in minimizing these gaps for low-income children.

In addition, New Zealand's preschool-age children are much more likely to see a dental provider. In 2009, almost 60 percent of that nation's 2- to 4-year-olds had a dental visit in the previous year,[19] while in 2010, the comparable rate for U.S. 2- to 4-year-olds was 31 percent.[20]

In order to improve access to care for preschool- and high school-age children, New Zealand recently relocated some clinics from elementary schools to community-based settings, such as health clinics, and transitioned others to mobile units. All children and adolescents can receive care in these settings regardless of age or socioeconomic status or whether they attend a public or private school.

Oral Health Status

Since 1976, New Zealand has been conducting periodic oral health surveys and using the findings to improve its dental delivery system.[21] The most recent survey (2009) describes improvements in oral health over time as well as areas where changes are warranted, including the need to increase prevention efforts for preschool-age children and to tackle persistent disparities in oral health, particularly for children of Māori and/or Pacific ethnicity.[22] New Zealand is increasing efforts to recruit dental therapy students from the Māori population.[23]

New Zealand's data offer insight into how a different approach to care delivery compares with the United States in terms of health outcomes. It is difficult to make perfect comparisons between the two countries because the age brackets for which each country reports data and the time frames of their surveys differ. The United States conducts surveys over several years. (The most recent U.S. data for 2- to 4-year-olds and for the status of permanent teeth in older children are from 1999 through 2004.)

Some important measures of oral health status in children are the rates of untreated decay and extent of decay, as well as missing permanent teeth due to cavities. Data for untreated decay rates are shown in Table 2.

Data also suggest that New Zealand has reduced the extent of tooth decay to levels at least as low as those of the United States. One widely used measure is the number of decayed, missing, or filled teeth, or DMFT, that a person has had—signaling a failure of prevention efforts. By this measure, New Zealand has achieved a similar outcome to the United States, and appears to do a better job of preventing the need for permanent tooth extractions. Of particular note is that in 2009, it was rare for New Zealand 12- to 17-year-olds to have any missing teeth due to decay.[24] The most recent U.S. data show that for every 100 12- to 19-year-olds, seven teeth were missing due to decay.[25]

While both countries can and should do better in addressing decay, it is significant that New Zealand achieves comparable performance to the United States on these two measures—prevalence of untreated decay and DMFT—with a substantially more cost-effective system of dental care for children. Training costs and salaries for dental therapists are much lower than for dentists. To use an American example, in Minnesota the cost of a 28-month dental therapy training program is $65,500 while a four-year dental school in Minnesota averages $160,000.[26] In a nonprofit practice in Minnesota, dentists are paid $75 per hour while dental therapists are paid $35 per hour.[27]

Prevention

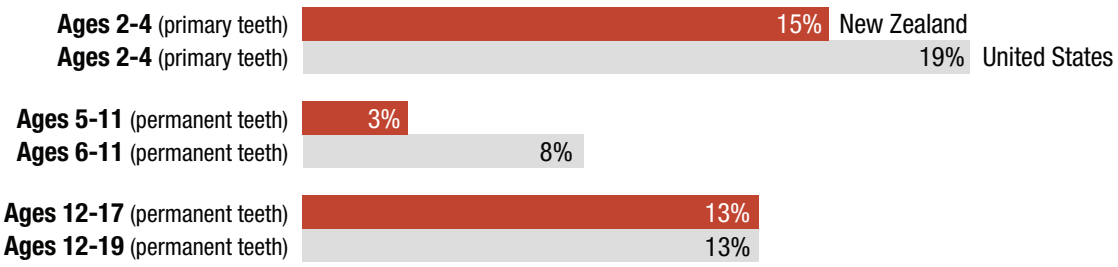
Prevention is a crucial component of New Zealand's dental health programs. Its Ministry of Health has taken many steps to improve preventive services, including encouraging medical providers to integrate oral health into routine care. For example, "well child" visits, which are free from birth through age 5, also

TABLE 2

ORAL HEALTH STATUS

(New Zealand: 2009[i]; U.S.: 1999-2004, 2005-2008[ii])

Prevalence of Untreated Decay



i. For New Zealand children: New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey*, 2010. Chapter 5, Tables 51 and 69.

ii. For U.S. children ages 2-4 and 6-11: B.A. Dye et al. "Trends in oral health status: United States, 1988–1994 and 1999–2004," National Center for Health Statistics. Vital Health Statistics 11 (248), 2007, Tables 11 and 22. For U.S. children ages 12-19: B.A. Dye, X. Li, and E. Beltrán-Aguilar. "Selected Oral Health Indicators in the United States, 2005–2008." NCHS data brief, no. 96. Hyattsville, MD: National Center for Health Statistics, 2012, Figure 1.

include dental health assessments.[28] The Community Oral Health Service provides additional preventive services, including fluoride varnish applications (a concentrated form of fluoride applied to a tooth's surface) for children at higher risk for decay.[29] Dental therapists also provide preventive care such as applying sealants on molars and offering oral health education for families and children. The relocation of some dental clinics from schools to community-based settings or mobile units is another part of this effort to increase access to preventive services, especially for preschool- and high school-age children.[30]

The significant rates of tooth decay in the United States and New Zealand reveal that neither country's system of care has effectively implemented all evidence-based prevention strategies. In 2003, New Zealand's Public Health Advisory Committee released a report on child health inequalities by income in which the authors recommended reducing oral health disparities by improving socioeconomic conditions, increasing water fluoridation, using topical fluorides, reducing the consumption of refined carbohydrates, and improving oral health services.[31]

Conclusion

The dental care systems in the United States and New Zealand could both do more to improve oral health services for children. New Zealand's one clear advantage is that it provides access to the vast majority of elementary school-aged children thanks to its more developed oral health infrastructure. That infrastructure includes a publicly funded system with school- and community-based health centers staffed by personnel to manage the facilities as well as dental

TABLE 3

AVERAGE NUMBER OF DECAYED, MISSING, AND FILLED PERMANENT TEETH (DMFT) AMONG 12- TO 19-YEAR-OLDS IN THE U.S. AND 12- TO 17-YEAR-OLDS IN NEW ZEALAND

	DMFT	Decayed	Missing	Filled
United States 12- to 19-year-olds, 1999-2004	2.6	0.5	0.07	2.0
New Zealand 12- to 17-year-olds, 2009	1.9	0.2	0.00	1.7

SOURCE: New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010, tables 71 (untreated decay), 73 (filled), 75 (DMFT), p. 148 (missing teeth). B.A. Dye et al. "Trends in oral health status: United States, 1988–1994 and 1999–2004." National Center for Health Statistics. Vital Health Statistics 11 (248), 2007, Table 27.

therapists collaborating with dentists on call to confer if the need arises. Although both countries need to work to improve oral health outcomes for their youth, New Zealand is achieving outcomes similar to those in the United States using different providers and a far more cost-effective system of care.

Initiatives to employ dental therapists or other types of midlevel providers present an opportunity to help people in U.S. communities where dentists are scarce or do not serve Medicaid-enrolled children. These practitioners could also improve the efficiency of the dental team, freeing dentists to perform the more advanced procedures for which only they are trained.[32] State leaders seeking to improve the oral health of children can look to New Zealand's experience as they consider policy improvements.

Endnotes

1. U.S. Department of Health and Human Services, *Oral Health in America: A Report of the Surgeon General*, DHHS, Rockville, MD, 2000, accessed January 18, 2012, silk.nih.gov/public/hck1ocv.@www.surgeon.fullrpt.pdf.

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

3. As of January 9, 2013, there were 45,115,590 people living in Dental Health Professional Shortage Areas. U.S. Department of Health and Human Services, Health Resources and Services Administration, *Designated Health Professional Shortage Areas (HPSA) Statistics as of January 9, 2013*.

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5. S. Wetterhall, *Evaluation of the Dental Health Aide Therapist Workforce Model in Alaska*, accessed December 31, 2012, www.wkkf.org/knowledge-center/resources/2010/10/alaska-dental-therapist-program-rti-evaluation-report.aspx. Minnesota Board of Dentistry, accessed December 31, 2012, www.dentalboard.state.mn.us/Licensing/ProcessingandApplications/DentalTherapist/tabid/1165/Default.aspx.

6. D. Nash, *A Review of the Global Literature on Dental Therapists: In the Context of the Movement to Add Dental Therapists to the Oral Health Workforce in the United States*, accessed April 10, 2012, http://www.wkkf.org/knowledge-center/resources/2012/04/nash-dental-therapist-literature-review.aspx.

7. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010, accessed November 2, 2011, www.health.govt.nz/publication/our-oral-health-key-findings-2009-new-zealand-oral-health-survey.

8. D. Nash, *A Review of the Global Literature on Dental Therapists: In the Context of the Movement to Add Dental Therapists to the Oral Health Workforce in the United States*, accessed April 10, 2012, http://www.wkkf.org/knowledge-center/resources/2012/04/nash-dental-therapist-literature-review.aspx.

9. D. Coates et al., "Dental Therapists and Dental Hygienists Educated for the New Zealand Environment," *Journal of Dental Education*, 2009; 73(8): 1001-8.

10. Ibid.

11. Ibid.

12. Modern dental therapists in New Zealand can be registered in both hygiene and dental therapy, which would allow them to provide care for adults and children.

13. New Zealand Ministry of Health. "Publicly funded health services: Visiting a dentist." Last updated June 2, 2011. Accessed May 14, 2013, http://www.health.govt.nz/new-zealand-health-system/publicly-funded-health-and-disability-services/visiting-dentist.

14. Dental Council of New Zealand, *2012 Annual Report*, www.dentalcouncil.org.nz/Documents/AnnualReports/DCNZ_Annual_Report_2012.pdf.

15. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010. Chapter 7, Table 93 (ages 5-11).

16. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010. Chapter 7, Table 93; Agency for Healthcare Research and Quality, Table 2.2: Percent of Children Age 2-17 with a Dental Visit in the Past Year: United States, 2010. Medical Expenditure Panel Survey Household Component Data. Generated May 9, 2013. meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=2010&tableSeries=-1&searchText=dental&searchMethod=1&Action=Search.

17. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010. Chapter 7, Table 93, refers to the most deprived quintile.

18. Agency for Healthcare Research and Quality, Table 2.2: Percent of Children Age 2-17 with a Dental Visit in the Past Year: United States, 2010. Medical Expenditure Panel Survey Household Component Data. Generated May 9, 2013.

19. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010. Chapter 7, Table 93.

20. Agency for Healthcare Research and Quality, Table 2.2: Percent of Children Age 2-17 with a Dental Visit in the Past Year: United States, 2010. Medical Expenditure Panel Survey Household Component Data. Generated May 9, 2013.

21. D. Nash, *A Review of the Global Literature on Dental Therapists: In the Context of the Movement to Add Dental Therapists to the Oral Health Workforce in the United States*, accessed April 10, 2012, http://www.wkkf.org/knowledge-center/resources/2012/04/nash-dental-therapist-literature-review.aspx.

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24. New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey,* 2010, p. 37, 148. Reported prevalence indicates that at least one of the 354 youth examined in the survey had a missing tooth due to decay.

25. B.A. Dye et al. "Trends in oral health status: United States, 1988–1994 and 1999–2004." National Center for Health Statistics. Vital Health Statistics 11(248). 2007. Table 27.

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32. B. Edelstein, *Training New Dental Health Providers in the U.S.*, Columbia University and Children's Dental Health Project, prepared for the W.K. Kellogg Foundation, June 2012, accessed February 20, 2012, www.cdhp.org/resource/training_new_dental_health_providers_us.