



# 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

# 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

## **PREPARED BY**

David A. Nash, Jay W. Friedman, Kavita R. Mathu-Muju, Peter G. Robinson, Julie Satur,  
Susan Moffat, Rosemary Kardos, Edward C.M. Lo, Anthony H.H. Wong, Nasruddin Jaafar,  
Jos van den Heuvel, Prathip Phantumvanit, Eu Oy Chu, Rahul Naidu, Lesley Naidoo,  
Irving McKenzie and Eshani Fernando

**This project was made possible with support from the W.K. Kellogg Foundation**

## EXECUTIVE SUMMARY

### PREFACE

The literature of the countries using dental therapists in their oral health workforces is extensive. Consequently, an attempt to summarize the literature is lengthy. The intention is to provide as comprehensive a review as possible in order that the existing global literature is accessible to anyone desiring to study it.

For a much more detailed and substantive summarization of the literature than is provided in this executive summary, the reader is referred to Section 17: “Summary and Conclusions.”

There are 1,100 documents referenced in the bibliography. Two-thirds of these are cited and annotated in this monograph. These are identified in boldface type in the bibliography.

### INTRODUCTION

“Oral Health in America: A Report of the Surgeon General” in 2000 highlighted the problems in oral health for many Americans—problems that are particularly acute for America’s children. Barriers to accessing care have created significant oral health disparities among the children of the United States. In addressing this issue, efforts have focused on the inadequacy of the oral health care workforce, with calls for expanding the workforce to include the development and deployment of individuals with the skills in caring for children traditionally associated with the school dental nurse/dental therapist in New Zealand and many other countries. A dental therapist is a limited practitioner who can provide basic dental care in the same manner as a dentist. Historically, the focus of a dental therapist has been on the prevention and treatment of dental disease in children.

Worldwide, the scope of a dental therapist’s practice generally includes examination, diagnosis and treatment planning; exposing radiographs; oral health education; preventive services such as prophylaxis, fluoride therapy, fissure sealants and dietary counseling; preparation of cavities in primary and permanent teeth and restoration with amalgam and composite; stainless steel crowns; pulpotomies; and the extraction of primary teeth. In some countries, dental therapists may also extract permanent teeth.

The introduction of dental therapists to the oral health care team in the United States is controversial. Some of the controversy relates to an inadequate understanding of the use of dental therapists as members of the dental team internationally. This monograph provides a literature-based review of the history and practice of dental therapists throughout the world.

The monograph reviews the literature, by country, for which documentation of the use of dental therapists could be identified. Individual sections cover the United States, New Zealand, Australia, the United Kingdom, Canada, the Netherlands, Hong Kong, Singapore, Malaysia and Thailand. Other countries are in sections by region: Africa, Caribbean and Pacific Islands. Finally, the literature of remaining countries is in a separate section, "Other Nations."

The executive summary and the final summary are organized by themes from the literature. They are: "History and Distribution of Dental Therapists"; "Education/ Training"; "Legislation, Registration and Licensure"; "Scope of Practice and Practice Settings"; "Oversight, Supervision and Safety of Care"; "Access to and Effectiveness of Care"; "Quality of Technical Care"; "Perspectives of the Dental Profession"; and "Perspectives of the Public."

## METHODS

A consultant was identified in each country considered to have a substantive literature on dental therapists. The monograph's 17 contributors are all academics or public health officials who are knowledgeable about dental workforce issues in their respective countries. The contributors conducted comprehensive searches for literature relating to the practice of dental therapists in their respective countries. They also focused on identifying "gray" documents—that is, reports of governmental agencies and nongovernmental organizations. In addition to obtaining copies of the documents, the consultants prepared written summaries and translated those that were in languages other than English.

One thousand one hundred (1,100) documents were identified that directly or indirectly related to the use of dental therapists in the global oral health workforce. They constitute the bibliography of the monograph. Two-thirds of these documents are cited within the monograph.

## HISTORY AND DISTRIBUTION OF DENTAL THERAPISTS

The use of dental therapists in the global oral health workforce began in New Zealand in 1921. Subsequently, other countries, lacking an adequate oral health workforce, followed New Zealand's lead. The research identified 54 countries and

territories where dental therapists currently are used, most often in school-based programs for children.

This monograph reviews documents of 26 of these countries: Anguilla, Australia, Bahamas, Botswana, Brunei, Canada, Fiji, Guyana, Hong Kong, Jamaica, Malaysia, Netherlands, New Zealand, Papua New Guinea, Samoa, Seychelles, Singapore, South Africa, Sri Lanka, Suriname, Tanzania, Thailand, Trinidad and Tobago, United Kingdom, United States and Zimbabwe.

No documents could be identified for the other 28 countries or territories. However, there is reliable evidence, in the form of verbal reports from knowledgeable persons that dental therapists practice in 16 of these 28 countries and territories. They are Barbados, Cook Islands, American Samoa, Federated States of Micronesia, Grenada, Kiribati, Marshall Islands, Nepal, Palau-Belau, Solomon Islands, Tokelau, Tonga, Vanuatu, Vietnam and Northern Mariana Islands.

Suggestive evidence (from other publications) indicates that dental therapists practice in the other 12 countries: Belize, Benin, Burkina Faso, Costa Rica, Gabon, Gambia, Laos, Mali, Malawi, Myanmar, Togo and Swaziland.

Early adopters of dental therapists include Malaysia (1948), Sri Lanka (1949), Singapore (1950), Tanzania (1955) and the United Kingdom (1959). Additional countries added dental therapists to their oral health workforces later, including Australia (1966), Thailand (1968), Jamaica (1970), Canada (1972), Fiji (1973), Seychelles (1974), South Africa (1975), Trinidad and Tobago (1975), Suriname (1976) and Hong Kong (1978).

The use of dental therapists is more common in countries that were members of the British Commonwealth. Of the 54 countries and territories employing dental therapists, 33 are members of the Commonwealth of Nations.

In the United States, the Alaska Native Tribal Health Consortium introduced dental therapists to care for Alaska Natives in tribal villages in 2005. In 2009, the state of Minnesota authorized the training and practice of dental therapists to care for underserved segments of its population. The first dental therapists entered practice in Minnesota in 2011.

Dental therapists serve in both developed and developing countries. Five of the top six countries of the world on the Human Development Index employ dental therapists in their oral health workforces: Australia (2), Netherlands (3), United States (4), New Zealand (5) and Canada (6). Other countries employing dental therapists in the top 50 countries of the Index are Hong Kong (13), Singapore (26), United Kingdom (28), Brunei (33) and Barbados (47).

## THE TRAINING AND EDUCATION OF DENTAL THERAPISTS

New Zealand pioneered the development of dental therapists, with the first class of 29 school dental nurses graduating from a two-year post-high school vocational training program in Wellington, New Zealand, in 1923. They were trained to provide dental care for elementary schoolchildren, and were deployed to serve in a public School Dental Service.

Vocational training in a two-year curriculum has been the tradition in the majority of countries using dental therapists, with the awarding of a certificate or diploma on completion. In some countries, the training of dental therapists has expanded to three or four years.

Gaining knowledge of the basic biomedical sciences supporting dental practice and the acquisition of perceptual motor skills tend to be the focus of the initial period of a curriculum, followed by intense clinical training. A strong emphasis on community oral health promotion and disease prevention is common.

In New Zealand, Australia and the United Kingdom the training of dental therapists and dental hygienists has been integrated into a three-year curriculum. The Netherlands has expanded its dental hygienists training to include dental therapists' skills, and extended the educational curriculum to four years. Singapore also provides opportunity for integrated training of dental therapists and dental hygienists. Continuing education modules are available in some countries, enabling dental therapists to add skills to their scope of practice.

## LEGISLATION, REGISTRATION AND LICENSURE

The legislation relating to dental therapists in the United States is particularly pertinent to this review. In 1949, legislation directed the Massachusetts Department of Public Health to provide dental hygienists two years of training, after which they would be permitted to prepare and fill cavities in children's teeth under the supervision of a dentist. Under pressure from the dental associations, the law was rescinded a year later. Again in the 1970s, authorization was provided for the "Forsyth Experiment," which successfully trained dental hygienists to provide basic dental services. However, under pressure from dentists, the program was terminated before its conclusion.

In 2003, the Alaska Native Tribal Health Consortium (ANTHC) sent Alaska Natives to New Zealand to train as dental therapists. They returned to be employed as Dental Health Aide Therapists (DHATs). The American and Alaska dental associations sued the ANTHC and the individual DHATs for the illegal practice of dentistry. The suit was withdrawn after the attorney general of Alaska

ruled that the DHATs were practicing under federal legislation and therefore not subject to state law. Federal regulations set the DHATs scope of practice; however, the services they can provide under general supervision can be limited by a supervising dentist.

In 2009, the Minnesota state legislature passed legislation authorizing creation of two categories of dental therapists, a dental therapist (DT) and an advanced dental therapist (ADT). As the legislation was passed to enhance access to care, DTs and ADTs must practice in settings serving low-income and underserved populations.

Literature on legislation, registration and licensure of dental therapists is sparse for most countries. Since most countries limit dental therapists to governmental service, they are not necessarily licensed or registered. Their scope of practice regulates their provision of care, with responsibility for supervision and review designated to their respective ministries of health.

Legislation, registration and licensure vary from country to country. National, state or provincial legislation authorizes the practice of dental therapists. Regulation is generally by dental councils (dental boards). In the many countries where dental therapists are public employees in school dental services, they are certified and regulated directly by the government's ministry of health or their employing service. In a few countries where more autonomy for practice is granted, dental therapists are licensed as professional practitioners, just as are dentists.

## **PRACTICE SETTINGS AND SCOPES OF PRACTICE**

In many countries, the setting for the practice of dental therapists has expanded from school-based clinics to community-based clinics, hospital clinics and mobile dental units.

However, the service has continued to focus on caring for schoolchildren, though not exclusively, as care is also provided to adults in some countries. Dental therapists in some jurisdictions are permitted to work in private practices caring for children. A few countries, however, also permit dental therapists to care for adults in the private sector. Although some countries are expanding the role of dental therapists to include adult care, children's dental care continues to be the most common assignment of dental therapists in the global oral health workforce.

The following countries use dental therapists as public employees serving children in a school dental service: New Zealand, Australia, Hong Kong, Singapore, Malaysia, Jamaica, Trinidad and Tobago, Bahamas, Anguilla, Papua New Guinea, Sri Lanka, Seychelles, Brunei, Guyana, Samoa and Suriname. Verbal evidence suggests that in the several countries for which literature could not be obtained,

dental therapists also function primarily in caring for schoolchildren. In these countries, the dental therapist's scope of practice is similar and includes basic procedures for providing primary preventive and restorative care for children as indicated previously.

While dental therapists' scope of practice typically is restricted to children, an increasing number of countries permit dental therapists, frequently with additional training, to treat adults as well. In New Zealand and Australia, dually qualified hygienists/dental therapists may provide dental therapists' treatments to children and adolescents, but only dental hygienists care for adults—absent special "adult competency" certification in restorative care.

## **OVERSIGHT, SUPERVISION AND SAFETY OF CARE**

The literature on dental therapists emphasizes their oversight and supervision by dentists to protect the public. As the majority of dental therapists work with children in public school-based programs, supervision is by a government dentist, who may or may not be on site. Dental therapists adhere strictly to protocols and standing orders, which are determined by the government service in which they work.

Levels of supervision vary among countries, and in different settings within the same country. In some countries, dental therapists may practice independently without dentist supervision; in others, they may work independently, but with a collaborative/consultative relationship with a dentist.

The literature does not document any issues of safety or harm as a result of care provided by dental therapists.

## **QUALITY OF TECHNICAL CARE**

There have been many evaluations of the technical quality of care provided by dental therapists over the past 60 years. The studies have consistently found that the quality of technical care provided by dental therapists (within their scope of competency) was comparable to that of a dentist, and in some studies was judged to be superior.

This monograph documents the results of assessments and studies that have taken place in many countries, including the United States, New Zealand, Australia, the United Kingdom and Canada. The continued use of dental therapists in the 54 countries and territories identified provides tacit documentation of an acceptable quality of technical care provided by dental therapists.

## ACCESS TO CARE AND EFFECTIVENESS OF CARE

The impetus for adopting dental therapists as part of the oral health workforce has typically been the objective of improving both access to care and effectiveness of care for children.

In most countries, dental therapists are public health employees deployed in school dental programs. Global studies show high and steadily increasing enrollment in school dental programs over time, and reveal their positive influence in improving access to care for large numbers of children—sometimes essentially the entire population of elementary schoolchildren in a given area.

In New Zealand in 2010, over 60 percent of children ages 2 to 4 years were enrolled in and utilized the publicly-funded child oral health services; 98 percent of 5-to-13-year-olds participated. In recent years, participation in Australia has been 62 percent; in Hong Kong 88 percent; and in Malaysia 96 percent of elementary schoolchildren and 67 percent of secondary school students have been enrolled. When the school dental program in Saskatchewan existed, 80 percent of schoolchildren were enrolled. It is thought that children from lower socioeconomic groups are more likely to benefit from school dental programs staffed with dental therapists.

Evaluations of dental services based on the dental health of the population must be seen in the light of falling levels of dental caries due to other factors, such as fluoridation, and the many factors that mediate the relationship between service provision and population health. However, data indicate that dental disease rates of children decline subsequent to the introduction of dental therapists in the oral health workforce.

The degree to which dental caries in children has been effectively treated is a strong and reliable indicator of the accessibility and effectiveness of dental care. Epidemiological data available since 1965 document that New Zealand has been more effective in treating dental caries in its public school-based program of care provided by dental therapists, than has the United States in its system of care in private offices by dentists.

According to the New Zealand Ministry of Health, in the 2010-11 year, the number of decayed filled teeth (dft) for children 2 to 11 years old was 1.6. Of this only 0.3 was due to decay, with 1.3 being filled teeth. Comparable numbers reflecting dental therapists' success in treating schoolchildren with dental decay exist in other countries as well.

A number of reports suggest the cost-effectiveness of dental therapist-led school dental services. The school dental programs in New Zealand and Australia cost less than private fee-for-service systems for the same service. The average cost of

school-based dental care in New Zealand in 2010-11 was \$99 (U.S.) per child. In the private sector in New Zealand, an examination, radiographs and cleaning in 2010-11 was \$102 (U.S.), and a one surface restoration cost \$99; a fissure sealant \$47.

In Australia, one study indicated that the annual cost savings by using dental therapists for care within their scope of practice, rather than dentists, could result in savings of 14-19 percent in dental expenditures. Another Australian study found that in one state the average cost of care for a child in a given year in the private sector was \$265, versus the cost for care by dental therapists in the school dental service of \$52.46.

The opportunity for more cost-effective care is related, in part, to the salary differential between dental therapists and dentists. An average New Zealand dental therapist earns between \$30,000 to \$40,000 (U.S.), and private-practicing dentists earn \$120,000 to \$150,000 a year (U.S.).

However, the cost-effectiveness of dental therapists cannot be calculated in isolation because they often work as part of a team, with dentists supervising them. The cost of these dentists should be incorporated into cost comparisons; therefore, more appropriate comparisons are between services that do and do not employ dental therapists.

## **PERSPECTIVES OF THE DENTAL PROFESSION TOWARD DENTAL THERAPISTS**

The perspective of the dental profession is well-represented in the literature on dental therapists. A comprehensive range of views is evident, but in general these views polarize into opponents and proponents. In some cases, the intellectual quality and tone of the debate has reflected poorly on the dental profession.

Many dentists and professional dental associations in the United States are opposed to the inclusion of dental therapists on the dental team. They have asserted that dental therapists threaten the safety of the public due to providing a lower quality of care and that they open a wedge for unqualified individuals to practice dentistry. Dental therapists have been described variously as a hazard and “a menace to the public, a menace to the [dental] profession, and an injustice to those seeking to enter the ranks of the [dental] profession.”

Proponents of dental therapists refute the assertions of the opponents and have accused them of having a hidden agenda, particularly of looking after their own economic interests. They cite studies that have shown that dentists, despite not knowing who dental therapists are or what they do, oppose them anyway.

Proponents claim that dental therapists' care has been evaluated on numerous occasions and in multiple countries. They argue that they provide high-quality, safe and effective care equal to that of dentists working under the same conditions, and do so at a lower cost. Dental therapists included on the dental team are thought to liberate dentists for more complex treatment. They also argue that services employing dental therapists extend the geographical reach of dentistry, increase access to care, and provide a safety net for those who cannot obtain care. Proponents equate the use of dental therapists with the use of dental hygienists in that they help free the dentist to do other work. They also compare dental therapists to 'mid-level' providers such as nurse practitioners, who function effectively in other areas of health care.

Both proponents and opponents of dental therapists have attributed views to the general public, often in the absence of evidence. Proponents claim that "patients—both adults and children—of every socioeconomic stratum will find care delivered by dental therapists to be entirely acceptable." Opponents have argued that they would not be accepted by the public, and might be resented by individuals in lower socioeconomic groups as providing second-class, inferior care.

The literature in this research indicates that, in general, the dental profession in the countries reviewed are supportive of the role dental therapists play in caring for the oral health of the population, specifically with regard to children. To the extent that concern or dissatisfaction could be identified in the literature, it typically related to dental therapists treating adults or practicing independently. The evidence suggests that once dental therapists have been introduced in a country, professional support for them increases over time.

Harold Hillenbrand, the respected executive director of the American Dental Association from 1946 to 1970, said: "When the dental history of our time is eventually written, I believe the New Zealand Dental Nurse Program will be considered one of the landmark developments in the practice of dentistry and dental public health." He went on to say that New Zealand has "pioneered in a very effective method for delivering dental health services to children." Finally, he concluded "the New Zealand experience proves that we can develop an auxiliary program—and a very advanced one—that is acceptable to and approved by the profession of the country involved."

## **PERSPECTIVES OF THE PUBLIC TOWARD DENTAL THERAPISTS**

In the United States, philanthropic foundations frequently provide leadership for the public in identifying societal problems and funding pilot projects to stimulate both private and public sectors in resolving them. The problem of access to health care and its negative impact on the health of poor and underserved populations

has been a focus of several U.S. foundations in recent years. With respect to oral health issues, these foundations have recognized that dental therapists in the oral health workforce can assist in addressing the problems of access and disparities. They have provided funds for research, advocacy and implementation of oral health care programs. Among them are the Josiah Macy Jr., Pew, Rasmuson, Robert Wood Johnson, and W.K. Kellogg foundations.

The W.K. Kellogg Foundation commissioned a national survey in 2011 on the views of Americans on the issue of access to dental care. “More than three-quarters of respondents (78%) support an effort to train a new dental provider—a licensed dental practitioner—to work under the supervision of a dentist to provide preventive, routine care to people without regular access to care.”

The high level of use of school dental services employing dental therapists in a large number of countries is strong evidence that the dental therapist can provide care that is acceptable to and valued by the public. Numerous and detailed evaluations of these programs, summarized in this monograph, reveal strong patient and parental support for care by dental therapists.

The people of New Zealand consider the School Dental Service with its dental therapists a New Zealand “icon.” Another report states: “The School Dental Service has become an integral component of the New Zealand culture. To Kiwis it is like motherhood, apple pie and the flag.”

Parents in Saskatchewan were “outraged” at the transfer of the school-based plan to the private sector.

No evidence could be found to indicate that the public perspective of dental therapists in any country was other than positive.

## CONCLUSIONS

The global literature indicates:

1. Dental therapists practice in 54 countries and territories, including highly developed, industrialized ones as well as developing countries.
2. There are variable lengths of training for dental therapists, from two to four years, with two years being the tradition.
3. There is a movement in a few countries to integrate the training, and therefore scopes of practice, of the dental therapist and dental hygienist. Typically this is in a three academic year (27 months) program.
4. Dental therapists, in general, are not licensed professionals, but rather practice as registered auxiliaries.

5. Dental therapists practice primarily in public clinics, typically associated with caring for schoolchildren.
6. Dental therapists' scope of practice is primarily in caring for children, although several countries permit caring for adults.
7. Dental therapists typically practice with general supervision by dentists.
8. Dental therapists provide technically competent care.
9. Dental therapists improve access to care, specifically for children.
10. Dental therapists are effective in providing oral health care within their scope of practice.
11. Dental therapists have a record of providing oral health care safely.
12. The dental profession in a country accepts the care provided by dental therapists as valuable; however, there are some exceptions to this.
13. The public values the role of dental therapists in the oral health workforce.
14. Dental therapists included in the oral health workforce have the potential to decrease the cost of care, specifically for children.