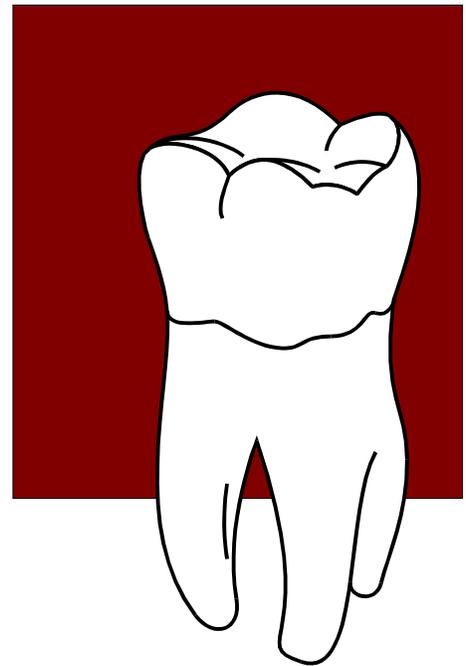


# Utah's Dentist Workforce:

A study of dentist workforce  
supply estimates, trends, and  
capacity to provide service





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Prepared by

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## **Acronym and Abbreviation Reference Guide**

ADA: American Dental Association  
ADEA: American Dental Education Association  
BYU: Brigham Young University  
CHEC: Child Health Evaluation and Care  
CHIP: Children’s Health Insurance Program  
DHPSA: Dental Health Professional Shortage Area  
DOPL: Department of Professional Licensing  
DWS: Department of Workforce Services  
FTE: Full-Time Equivalency  
GAO: Government Accounting Office  
GOPB: Governor’s Office of Planning and Budget  
HPSA: Health Professional Shortage Area  
PIE: Professional Insurance Exchange  
PHS: Public Health Service  
SDA: Service Delivery Area  
SDB: Shortage Designation Branch  
UDA: Utah Dental Association  
UDOH: Utah Department of Health  
UMEC: Utah Medical Education Council  
VA: Veteran’s Affairs

# Executive Summary

**S**ince 1997, the Utah Medical Education Council (UMEC) has provided objective policy relevant analyses and information to evaluate the service capacity of Utah's healthcare workforce, both estimated and projected. The UMEC makes recommendations to the state governor and legislature in support of strategies needed to ensure that Utah has a healthcare workforce able to meet the needs of its growing and diverse population.

## BACKGROUND

In 2002, the Utah Medical Education Council compiled private, state, and federal data of Utah licensed dentists, to assess the supply, distribution, and characteristics of the state's dentist workforce. Various initiatives and programs designed to increase access to dental care were then considered, as they related to their potential effect on the total dentist population. The primary sources of data compiled for this report were obtained from the American Dental Association, Utah Dental Association, Department of Occupational and Professional Licensing, Utah Department of Workforce Services, United States Department of Health and Human Services Health Resources and Services Administration, Utah Department of Healthcare Financing, Utah Governor's Office of Planning and Budget, and the Utah Office of Primary Care and Rural Health. Various state and federal studies were used to supplement these primary sources. It is important to note the dates of the data referenced and the source(s) of the material, in order to ensure accurate interpretation and representation of the figures presented. This report provides the following information:

1. The estimated 2002 Utah dentist-to-population ratio;
2. Factors affecting dentist supply and utilization;
3. National trends in dental education and the impact on workforce supply;
4. Factors affecting the dentist workforce: attrition and migration rates;
5. State labor demand for dentists;
6. Patient and population characteristics;
7. Dental Health Professional Shortage Designation Areas;
8. Federal and State programs affecting access to dental care;
9. Medicaid enrollees, reimbursement rates, and dentist participation in the program.

## FINDINGS

The major findings of the study are presented below.

### **Dentist supply and distribution**

- In Utah, the 2002 dentist workforce ratio is 61.74 dentists per 100,000 population.
- There are an estimated 1,417 professionally active dentists in Utah.
- The number of dentists per 100,000 population varies by county, with 17 of Utah's 29 counties experiencing provider ratios below the state's 61.74 average.
- Only 2.8 % of dentists licensed to practice in Utah are female. This constitutes the lowest ratio in the nation. The national average of women in professional dental practice is 14.4%.

- 91% of the Utah dentist workforce is in private practice.
- Of the total 1,286 *active private practitioners* in Utah, 1064 are in general practice, 36 specialize in Oral & Maxillofacial surgery, 26 are Endodontists, 105 specialize in Orthodontics, 28 specialize in Pediatric Dentistry, 19 specialize in Periodontics, and 9 are Prosthodontists.
- All 29 counties in Utah have been designated as a Health Professional Shortage Area (HPSA), but only 5 of the counties have HPSA designations based upon a shortage of dentists. 3.2% of the state's population reside in those 5 counties.
- Utah attracts 1 dental school graduate for every 36,851 residents, compared to the national average of 1 graduate to every 67,158 residents.
- Under current conditions, Utah will not begin to experience a shortage of dentists until the year 2009.
- 79.2% of Utah's dentists practice in counties where 76.1% of the population live.

### **Dentist participation in Medicaid**

- 6.5% of the Utah dentist workforce treat over two-thirds of the Medicaid patients.
- 20% of dentists accepting Medicaid patients submitted fewer than 6 claims in an entire year.
- 24 of Utah's 29 counties were designated Dental Health Professional Shortage Areas because of the lack of dentists participating in Medicaid.
- Only 56,012 out of 222,360 Medicaid enrollees (for the year 2000) received dental service(s). The percentage of Medicaid enrollees experiencing the greatest access difficulties to dental care reside in four counties; Beaver, Garfield, San Juan, & Wasatch.

### **Dentist workforce retirement activity**

- 15% of the dentists licensed to practice in Utah are under age 35, 49% are between the ages of 35-54, and 35% are age 55+.
- 2.78% of Utah dentists leave the workforce annually due to retirement.
- An estimated 41.17 dentists will retire in the year 2003, while Utah continues to attract a 5 year average of 71.6 new dentists
- The dentist workforce retirement rate is projected to remain constant over the next thirty years, with the exception of a 20 percent increase in numbers retired between the years 2011-2015 due to a surge in retiring baby-boomers.

## **SURVEY RECOMMENDATIONS**

The existing dental workforce data used in the preparation of this report provided a valuable baseline of information. Additional knowledge would enhance the dentist workforce profile. A complete profile of Utah's dentist workforce will help to determine projected workforce gaps by specialty and location, and aid in the creation of programs designed to alleviate patient barriers to dental care. Many states such as Wisconsin have created statutes mandating the completion of a workforce survey prior to obtaining licensure to practice. These mandates have proven to be valuable tools for collecting health care workforce data. Utah would benefit from a similar mandate. The information obtained would significantly aid the state legislature in developing successful health care policies. Due to the current state budget deficit, the Utah Medical Education Council was unable to survey or monitor the dentist workforce to obtain the following information:

- Race and ethnicity of Utah primary care dentists;
- Percentage of Utah students that return to the state to establish practice;
- Reasons Utah students return to the state after completing dental school;
- Provider’s contributions, intentions, and willingness to provide donated dental care;
- The characteristics of dentists who do and do not participate in Medicaid;
- Projected short-term changes in dentist workload capacity;
- Traits and features of dentists’ practices;
- Trends in employment availability and market saturation/opportunities by time, specialty, and geography;
- Characteristics and demographics of dental patients;
- Dental specialty needs and projections;
- Estimated figure of excess capacity to provide dental service;
- Schools that supply significant numbers of dentists to Utah.

## **CONSIDERATIONS FOR POLICY ANALYSTS**

The findings in this report reveal trends, patterns, and relationships found in both Utah’s dentist workforce and population. Important questions are raised regarding the supply and characteristics of dentists practicing in Utah. It is essential that comprehensive data be collected and analyzed if policy makers are to pursue educated and informed responses to problems associated with Utah’s dentist workforce and the needs of the state’s population. The Utah Medical Education Council recommends the following initiatives as methods to be used towards the attainment of a healthy population and an adequate dentist workforce:

- Provide means to increase Medicaid reimbursements to an acceptable percentage of the usual and customary rate for dental services;
- Subsidize and expand programs that increase access to dental care, such as the Mobile Dental Clinic;
- Conduct a feasibility study for a Utah dental school in the expectation of a state and national dentist shortage;
- Offer programs that provide more lucrative incentives for dentists of all specialties to serve residents in rural and underserved areas of Utah;
- Expand and develop relationships with state and private dental schools (i.e. Creighton University School of Dentistry) to create a pipeline for Utah dental students to receive an education and then return to the state to establish practice;
- Sponsor and support both early intervention/awareness programs and measures designed to fluoridate Utah’s water supply. Calculated actions in favor of these propositions will measurably reduce costs incurred by the state for restorative/repair dental services.



# Utah's Dentist Workforce:

A study of dentist workforce supply estimates, trends, and capacity to provide service

## A. Introduction

In a workforce report (2000), the American Dental Association (ADA) suggested that the national dentist-to-population ratio was declining due to the marginal increase in the number of dentists compared to the growth of the national population. The dentist-to-population ratio is expected to decline by 12 percent between 2001 and 2015.<sup>1</sup> In light of this report, the Utah Medical Education Council (UMEC) has conducted a preliminary study of Utah's dentist workforce and its capacity to provide care to the population. An accurate perception of Utah's dental care capacity is critical, considering Utah's dependency on out-of-state institutions for professional training of its dentist workforce.

The size of Utah's dentist workforce alone is not indicative of the dentists' effectiveness to render service to the state's residents. Notwithstanding the number of dentists practicing in Utah, there are still significant population groups experiencing unmet

needs regarding access to dental care and treatment of oral health problems. For example, dental cavities continue to be the single most chronic childhood disease, 5 times more common than asthma. Despite common misconceptions, it is impossible to have a healthy population that persistently experiences poor oral health. This report addresses issues affecting Utah's dentist workforce and the population's ability to access dental services by:

- Examining the factors that affect the adequacy of Utah's dentist workforce;
- Addressing key issues that directly affect the demand placed upon the dentist population;
- Calculating the retirement rate of dentists and Utah's success in attracting new dentists to the state;
- Identifying population groups characterized as having limited access to dental care;
- Calculating the number of Utah dentists accepting Medicaid reimbursements;
- Projecting dentist workforce estimates.

## B. Utah Dentist-to-Population Ratios

Dentists represent the fourth largest health professional group in the United States. Determining the exact size of the dentist population in Utah has been a difficult task. The UMEC examined several sources to determine a dentist-to-population ratio that best reflects the condition of Utah's current workforce. These sources included the ADA, the Utah Dental Association (UDA), the Utah Department of Health, Division of Health Care Financing, malpractice insurance providers, the Department of Occupational and Professional Licensing (DOPL), and the Internet Yellowpages. The findings are as follows:

- In 1999, the ADA estimated the national *professionally active* dentist population to be

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<sup>1</sup> American Dental Association (ADA). *Dentist workforce model: 1998-2020*. Chicago, IL: 2000.

164,664<sup>2</sup>, suggesting a national ratio of 60.38 dentists for every 100,000 people in the U.S.

- Throughout much of the last decade, Utah's dentist population ratio has been higher than the national average. In 1999, the ADA reported 1,354 professionally active dentists in Utah.<sup>3</sup> This equated to a ratio of 61.74<sup>4</sup> dentists per 100,000 population in the state of Utah, slightly higher than the national ratio.
- The 2002 UDA dentist directory listed 1,264 members in its organization, of which 118 were declared retired<sup>5</sup>. UDA records also identify another 271 professionally active nonmembers. The UDA estimates that between 80 and 90 percent of Utah dentists are members of the said organization. The 2002 professionally active dentist-to-population ratio (using UDA figures) is calculated to be 61.74, identical to the ADA's 1999 estimates.
- The Utah Department of Health, Division of Health Care Financing concluded that there were 1,532 dentists practicing in Utah as of November 2000. It is important to note that their database did not distinguish between professionally active, private practitioner, and retired dentists. Using state population figures for the year 2000, the estimated aggregate dentist-to-population ratio would have been 68.18.
- Another method of establishing an active dentist-to-population ratio is to determine the number of dentist with current malpractice insurance. Several insurance providers of Utah dentists were consulted

in order to validate dentist population estimates. The Professional Insurance Exchange (PIE) reported 1,111 insured dentists in the year 2001. By PIE's own estimates, they believe they insure almost 90 percent of dentists practicing in Utah. Another insurance provider, Professional Benefits Insurance, reported insuring 125 dentists in Utah during the year 2001. Dentist's Advantage reported insuring only 10 active dentists in Utah during the year 2001. The number of insured dentists by these three companies alone, totals 1,246 for the year 2001<sup>6</sup>. This incomplete listing provides an approximated dentist-to-population ratio of 54.26 dentists per 100,000 using the 2001 population figures given by the Utah Population Estimates Committee. This ratio reflects an incomplete estimate of practitioners who have *active private practices*. This is due to the impracticality of consulting every insurance provider of Utah dentists. This estimate is valuable in that it assures there are at least 1,246 active privately practicing dentists in Utah. For comparison purposes, in 1999 the ADA reported 1,288 active private practitioners in Utah.<sup>7</sup> (*See Table: 1*) Active private practitioners are defined as dentists whose primary and/or secondary occupation is private practice (full- or part-time).<sup>8</sup>

- In the third quarter of 2001, the DOPL had 2,135 licensed dentists on record. Of those dentists, 1,601 had Utah addresses. Using this figure to calculate the Utah dentist population has an undetermined margin of error, because it assumes that all licensed dentists with Utah addresses are actively practicing in the state, and those dentists without a Utah address do not practice in the state of Utah.

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<sup>2</sup> American Dental Association. *1999 Distribution of Dentists in the United States by Region and State*. Chicago, IL: American Dental Association; 2002. 8.

<sup>3</sup> American Dental Association. *1999 Distribution of Dentists in the United States by Region and State*. Chicago, IL: American Dental Association; 2002. 27.

<sup>4</sup> Ratios are calculated using population figures provided by the Utah Population Estimates Committee; <http://www.governor.utah.gov/dea/demographics/upec/Estimate/s/estimates.htm>. Accessed September 25, 2002.

<sup>5</sup> Note: The UDA is believed to have one the most accurate lists of practicing dentists for the state of Utah. The exact characteristics of the dentists' practices are undetermined.

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<sup>6</sup> For logistical reasons, not all insurance providers were contacted, thus leaving the possibility for a larger dentist population.

<sup>7</sup> American Dental Association. *1999 Distribution of Dentists in the United States by Region and State*. Chicago, IL: American Dental Association; 2002. 37.

<sup>8</sup> American Dental Association. *1999 Distribution of Dentists in the United States by Region and State*. Chicago, IL: American Dental Association; 2002. 4.

**Table: 1**

<b>PRIMARY OCCUPATION OF ALL ACTIVE PRIVATE PRACTITIONERS</b>	
General Practice	1,064
Oral & Maxillofacial Surgery	36
Endodontics	26
Orthodontics, Dentofacial, & Orthopedics	105
Pediatric Dentistry	28
Perio- dontics	19
Prosthodontics	9
Public Health Dentistry	1
<b>Total</b>	<b>1,288</b>

**Source:** The American Dental Association. (1999) Distribution of Dentists in the United States by Region and State.

**Table: 2**

<b>DENTIST POPULATION/RATIOS</b>			
<b>Organization</b>	<b>Year</b>	<b>Estimated Total Dentists</b>	<b>Ratio per 100,000</b>
ADA Professionally Active (National)	1999	164,664	60.38
ADA Professionally Active (Utah)	1999	1,354	61.74
Utah Department of Health	2000	1,532	71.24
Insurance Companies	2001	1,246	56.95
DOPL	2001	1,601	73.17
Yellowpages.com	2001	1,656	75.69
Utah Dental Association	2002	1,417*	61.74

**Source:** Compiled by author.

\*Number does not reflect the retired membership of the UDA

■ A 2001 Internet search for Utah dentists on Yellowpages.com reported a total number of 1,656 dentists' offices and clinics. It must be noted that the Yellowpages.com search engine reported some dentist practices more than once due to multiple practice locations as well as overlapping characteristics of both general and specialty practitioners. Ratios based upon these figures would exaggerate the actual workforce number. (See Table: 2)

Figures and ratios must be used with caution when cross comparing. The ADA estimate (1,345) is

based upon *professionally active dentists*. (See Table: 3) Those dentists are defined as<sup>9</sup>:

- Private practice (full or part-time)
- Dental school faculty/staff member
- Armed forces
- Other federal service (i.e., VA, PHS)
- State or local government employee
- Hospital staff dentist
- Graduate student/intern/or resident
- Other health/dental organization staff member

Figures of the ADA's specificity do not currently exist for other dentist population estimates. It is therefore not possible to compare dentist populations and ratios without consideration of the source data. Despite the obvious discrepancies in the dentist population estimations, the UMEC has concluded that the UDA 2002 dentist population estimate of 1,417 is the most accurate of any available. Of those, at least 1,246 are presumed to have active private practices because of their enrollment with various malpractice insurance providers. Dentists, as well as other health professionals tend not to enroll with a malpractice insurance provider unless privately practicing, due to the substantial costs involved. The dentist-to-population ratio (61.74) is supported by the corresponding 1999 ADA ratio.

The dentist-to-population ratio is at best, a rudimentary tool used to measure dental care capacity. It has recently drawn a substantial amount of criticism as a relevant indicator of ability to provide oral health treatment. A major shortcoming of the dentist-to-population ratio is its lack of consideration for dentist productivity affected by hours worked, use of auxiliary personnel, advanced practice methods, and mix of services provided. Nor does it account for location of practices relative to underserved populations.<sup>10</sup> Utilization of dental services (both potential and historical) is not

<sup>9</sup> American Dental Association. *1998 Distribution of Dentists in the United States by Region and State*. Chicago, IL: American Dental Association; 2000. 5.

<sup>10</sup> Surgeon General. *Oral Health in America, Provision of Oral Health Care*: 1999. 235.

**Table: 3**

<b>UTAH OCCUPATION ESTIMATIONS</b>		
<b>Primary Occupation</b>	<b>1999 ADA Survey</b>	<b>Population as a %</b>
Private Practice > 30 hrs/wk	1,143	82.23%
Private Practice < 30 hrs/wk	127	9.14%
Dental School Faculty/Staff	4	0.29%
Armed Forces	12	0.86%
Other Federal Service	5	0.36%
State or Local Gov. Employee	19	1.37%
Hospital Staff	4	0.29%
Graduate Student/ Intern/Resident	9	0.65%
Other Health/Dental/ Organization staff	17	1.22%
Not in Practice/Looking for Opening, Waiting for Boards	5	0.36%
Other Unrelated Occupation	6	0.43%
Missing	39	2.81%
<b>Totals</b>	<b>1,390</b>	<b>100%</b>

**Source:** The American Dental Association. (1999)  
Distribution of Dentists in the United States by Region  
and State.

accounted for when determining the capacity of a dentist-to-population ratio. For example, in 1996, only 43 percent of the U.S. population visited a dentist, compared to 73 percent visiting a physician.<sup>11</sup> An agreed upon ratio may later become woefully inaccurate if the population were to increase their utilization of the dentist workforce. The ADA has abstained from suggesting an ideal ratio because of the unique characteristics associated with each state and population segment. A suggested ratio is arbitrary at best and is subject to interpretation. The dentist-to-population methodology however is instrumental in the tracking of trends.

Given current market conditions and population data, the UMEC supports the UDA figure for professionally active dentists (1,417) and believes that the implied ratio of 61.74 dentists per 100,000 population is adequate to serve the needs of the state. Utah's dentist population will likely experience

<sup>11</sup> Krauss N, Machlin S, Kass B. (1996) *Use of health care services*. Agency for Health Care Policy Research; 1999, *MEPS Research Findings No 7*. AHCPR

further requests for services as the economy improves and Medicaid reimbursement rates increase. The UMEC believes that Utah's current dentist-to-population ratio, if maintained, will be satisfactory in meeting any additional demands placed upon the dentist workforce. Access to this dentist population will depend upon the distribution of the dentists themselves and their willingness to accept low-income patients.

### **C. Factors Affecting Dentist Population and Utilization**

In the 1990s, the national dental supply growth fell below overall population growth, yielding a small decline in the ratio. It is expected that the national dentist-to-population ratio will continue to decline from 2000 to 2010. The ADA estimates that by 2014, the number of dentists retiring will exceed the number of new dental graduates, thereby creating a significant shortfall in the ability of the dentist workforce to meet the nation's needs.

Concerned with a potential oversupply due to economic downturns, reductions in childhood caries, more efficient practice methods, and declining dental school applicant numbers, the dental profession reduced the number of new graduates by closing schools and reducing class sizes in the early 1980s. The national number of dental school graduates peaked in 1983 (5,700), declined through the late 1980s, and leveled off in the 1990s at 3,900.

Since many states (including Utah) are now addressing the common problem of low Medicaid fee schedules, it will be instructive to see the extent to which any excess capacity for dental services will be shifted to the Medicaid population as financial barriers are lowered.<sup>12</sup> Legislature must first resolve to make dental care access for underserved populations an item of priority before an increase in Medicaid reimbursements will take effect. Efforts to

<sup>12</sup> Cooksey, J.D., (2000), *Workforce Challenges for Dentists and Pharmacist*: HRSA Newsletter, January 2000

allocate more funds to Medicaid for dental services are further restrained by current and projected budget deficits in Utah and other states.

The economy is another major force that affects the dental profession. A significant portion of dental service is aesthetic. When the economy is robust and people have disposable income, the population's demand for aesthetic dental services, such as teeth straightening and whitening, increases. The additional demands placed upon dentists in a healthy economy must be considered when determining needed dentist-to-population ratios for a given community.

### D. Factors Impacting Dental Education

One current educational trend is the steady decline of the national dentist pool compared to the increasing population. This is primarily due to class size capacity and a limited number of training facilities. Experts believe that the national dentist-to-population ratio has been in a steady decline since the mid 1990s. As of November 2001, the ADA reported 54 accredited dental schools in the U.S. and 10 in Canada. During the 1999/2000 academic year, there were 17,242 students enrolled in pre-doctoral education programs, 4,896 students in advanced education programs, and 19,632 in allied education programs. Pre-doctoral enrollment was at its highest level during the late 1970s/early 1980s, with peak enrollment of 22,842 in the 1980/1981 academic year. Because of budget allocations, schools must undergo difficult measures to restore current class sizes to 1970/80 levels. Since the early 1990s, first-year pre-doctoral enrollment has risen an average of 1.1% annually.<sup>13</sup> Two of the newest dental schools located in the west that may divert dental graduates to Utah are in Las Vegas, Nevada and Phoenix, Arizona.

<sup>13</sup><http://www.ada.org/prof/prac/issues/survey/faq.html#students-enrolled>. Accessed September 25, 2002

Increasingly, more dental specialty programs are requiring dentists to complete residencies prior to enrollment. The University of Utah School of Medicine operates a dental residency program, with 6 residents currently enrolled. The program will be expanded to 8 in July of 2003, and then to 10 in 2004. Utah's Primary Children's Hospital has 2 additional residents that specialize in pediatric dentistry. Currently, there are no plans to expand this program.

Students of Utah colleges and universities have traditionally exhibited strong interest in the dental profession. Utah has 5 undergraduate pre-dental programs. In 2001, 299 students applied to dental school. Of those, 257 (86 percent) were accepted into dental programs throughout the country. (See Table: 4) It is important to note that only 50-60 percent of those students accepted into dental school were residents of Utah. Students in Brigham Young University's (BYU) pre-dental program enjoy one of the highest dental school acceptance rates in the nation, generally fluctuating between first and third. In 2002, 94 percent of the 190 BYU students that applied were accepted. Almost 35 percent of those accepted were Utah residents.

**Table: 4**

<b>Dental School Acceptance Rates from Utah's 5 Pre-Dental Programs, 2001</b>			
	<b>Applied</b>	<b>Accepted</b>	<b>Percent</b>
Brigham Young Univ.	181	164	91%
Southern Utah Univ.	18	15	83%
Utah State Univ.	23	15	63%
Univ. of Utah	55	41	75%
Weber State Univ.	22	22	100%
<b>Total</b>	<b>299</b>	<b>257</b>	<b>86%</b>

Source: Compiled by author.

This pipeline of graduates returning to Utah has provided an adequate supply of dentists to serve the state's oral health needs. The State of Utah will continue to rely upon the nation's dental schools for the training of its dentist workforce so long as Utah students are able to gain admissions into dental programs. However, if enrollment rates drop significantly in consequence of an increasingly competitive market, the State of Utah may need to

deliberate upon the establishment of its own dental school. Factors that would support the consideration of a Utah dental school are:

- Utah students experience a decline in their acceptance rate into the nation's dental schools;
- The pipeline of dental school graduates coming to Utah is inadequate to meet the states needs;
- Current and prospective Utah dentists are lured to more favorable markets outside of Utah to establish practice, thus creating a shortage;
- Programs within a dental school curriculum can be constructed in a cost-effective manner, to provide substantial assistance to those populations of the state characterized as disadvantaged or underserved.

Economic conditions may soon make it more difficult for nonresident students to gain admissions into state sponsored dental schools. In 2002, the American Dental Education Association (ADEA) reported that public dental schools increased tuition amounts by an average of 9.21 percent for nonresidents and 12.32 percent for state residents. Private schools on the other hand, raised tuition by an average of only 5 percent in the year 2002.

State dental schools are reevaluating the mix of resident-to-nonresident students accepted into their programs. With Dental Health Professional Shortage Areas (DHPSA) becoming more common, many states are forced to consider initiatives that would increase dental care access for their respective populations. One proposition suggests that state dental schools increase the percentage of first-year slots reserved for in-state students. This would further limit the number of openings for nonresident students. Already, 59 percent of the 4,315 first-year slots available in U.S. dental schools are reserved for in-state residents. Augmenting this percentage will make it increasingly more difficult for Utah students to gain admissions into dental school.

With budget deficits across the board, states are increasingly skeptical of subsidizing the training of out-of-state students when their own state is suffering

from a dearth of dentists. States such as Iowa, Oregon, Virginia, and Missouri typically finance 38 percent (\$11 million on average) of their dental school's operating costs. The cost benefit of training nonresident students has grown increasingly less favorable. Studies have shown that graduates are most likely to establish their practices in their state of origin. Decreasing the number of nonresident students and expanding the number of openings for resident students is one possible method that can be employed to alleviate the access problem occurring within states that have dental schools. Initiatives such as this would negatively affect states such as Utah, which do not have dental programs.

## E. Attrition and Migration Rates

DOPL's third quarter 2001 database of licensed dentists residing in Utah (1,601) provides age demographics of dentists. Based upon recent figures, the ADA Survey Center in Chicago has calculated an average retirement age of 63 for dentists practicing in the United States. In 1985, the average retirement age was 62<sup>14</sup>. Using age 63 as a base, the retirement rate of dentists currently practicing in Utah has been calculated using 5-year intervals. Excluding the dentist population over 70 years of age, as well as those for whom no age was reported, an estimated 41.17 dentists in Utah will retire in the next year. This equates to a retirement rate of 2.78 percent, which is comparable to other Utah health professions. This retirement rate is projected to remain relatively constant over the next 30 years, with the exception of a 20 percent increase between the years 2011-2015 due to a surge in retiring baby-boomers. Plans for retirement have a significant effect on the number of new dentists needed to replace the void left by departing practitioners. For rural or underserved areas, the retirement of a practicing dentist can mean decreased access, or no access to oral health care. This situation becomes particularly cumbersome for

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<sup>14</sup> Jackson, J.B., Kart, C.S., Wagner, K.S., Rowe, A.R.. *A survey of retired dentists in the United States*. Council on Dental Practice. JADA 1985;110:386-9.

**Table 5:**

<b>GENDER</b>		
<b>Sex</b>	<b>Frequency</b>	<b>Percent</b>
Male	1,461	97.2
Female	43	2.8
Unknown	97	0.0
<b>Total</b>	<b>1,601</b>	<b>100</b>

Source: DOPL Data Base, 2001

**Table 6:**

<b>YEARS TO RETIREMENT</b>		
<b>Years</b>	<b>Frequency</b>	<b>Percent</b>
2001-2005	305	18.9
2006-2010	186	11.6
2011-2015	227	14.2
2016-2020	189	11.8
2021-2025	193	12.1
2026-2030	197	12.3
2031-2035	216	13.5
2036-2040	74	4.6
Unknown	14	0.8
<b>Total</b>	<b>1,601</b>	<b>100</b>

Source: Calculated by author using 2001 DOPL Data Base

**Table 7**

<b>PERCENTAGE AGE DISTRIBUTION</b>		
	<b>DOPL*</b>	<b>ADA**</b>
<b>AGE</b>	<b>Percentage</b>	<b>Percentage</b>
< 35	15.3	16.0
35-44	25.0	25.4
45-54	24.6	30.9
55-64	21.1	18.0
65+	14.0	10.2
Mean Age	49.6	47.9
<b>Population Total</b>	<b>1,601</b>	<b>1,354</b>

Source\*: DOPL Data Base, 2001

Source\*\*: American Dental Association. (1999) Distribution of Dentists in the United States

vulnerable populations if the retired dentist accepted Medicaid patients. (See Tables: 5-7 & Figure 1.)

Throughout the last decade, Utah has been able to successfully attract a healthy number of dental school graduates relative to its population size. Specific reasons for this phenomenon have not yet been identified. (See Table: 8) Nationally in 1998, there was one dental school graduate for every 67,158 residents. By comparison, Utah was able to attract one new dental school graduate for every

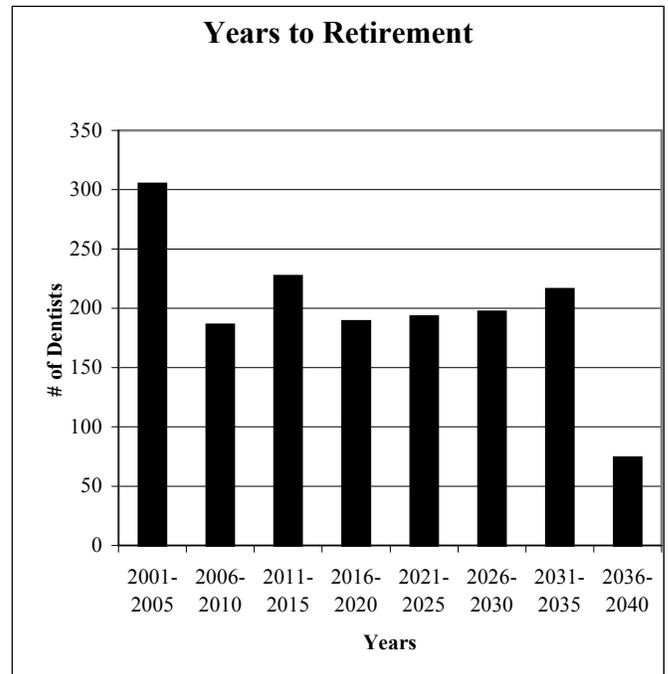


Figure 1. Shows the number of dentists expected to retire in 5 year intervals. The 2001-2005 time interval is proportionally higher because it assumes all licensed dentists over the age of 65 are retired. Source: Calculated by author using 2001 DOPL Data Base.

36,851 residents. The possibility of a decline in the national dentist pool may threaten Utah’s inherent attractiveness. National shortages may drive dental school graduates with previous intentions of practicing in Utah to favorable conditions in other states.

The number of new dentists applying for and receiving licensure in Utah increased over 300 percent between 1990 and 2001. In the year 1990, 34 new dentists received a license to practice dentistry in the state of Utah. Of those 34 dentists, 26 had Utah addresses. By 2001, an additional 108 dentists received licensure to practice in Utah. Of those, 76 had Utah addresses. Total applications for new licensure peaked in 2000 at 113, of those 84 had Utah addresses. (See Table: 9 & Figure 2.) In a 1998 survey, the ADA estimated that 57 new dental school graduates were practicing in Utah<sup>15</sup>.

<sup>15</sup> American Dental Association. 1998 Distribution of Dentists in the United States by Region and State. Chicago, IL: American Dental Association; 2000. 7.

**Table: 8**

<b>NEW DENTAL GRADUATES IN UTAH</b>						
<b>Year</b>	<b>*Total Number of Graduates</b>	<b>**U.S. Pop. In Thousands</b>	<b>*Utah Pop. In Thousands</b>	<b>Utah's Pop. as a % of National</b>	<b>**New Graduates Practicing in Utah</b>	<b>% of New Graduates Practicing in Utah</b>
1998	4,041	271,387	2,142	0.79%	57	1.41%
1997	3,930	268,930	2,099	0.78%	58	1.48%
1996	3,824	266,398	2,043	0.77%	74	1.94%
1995	3,909	263,909	1,995	0.76%	41	1.05%
1994	3,863	261,431	1,947	0.74%	53	1.37%

**Source\*:** American Dental Association. (1999) Survey of Dental Graduates.

**Source\*\*:** Population Estimates Program, Population Division, U.S. Census Bureau

**Source!:** Utah Population Estimates Committee

**Source"':** DOPL Data Base, 2001

**Note:** The ADA reported 57 new dental school graduates employed in Utah during 1998. DOPL reported 57 new in-state licensed dentists for the same year.

For the same year, DOPL reported 57 new licenses issued to dentists with in-state addresses. In the year 2000, the UDA reported 72 new members. Assuming that the reported UDA membership represents approximately 85 percent of the Utah dentist population, it is calculated that the total new dentist population in Utah for the year 2000 was 84. For the same year, DOPL reported 84 new licensed dentists with in-state addresses. The strength of the UDA and ADA cross comparisons suggest that the DOPL database is an accurate tool for estimating the number of new dentists practicing in Utah. Over the last five years, Utah has averaged 71.6 new in-state licensed dentists.

## F. Labor Demand

The report *Utah Job Outlook*, published by the Utah Department of Workforce Services (DWS), ranks only those occupations that are considered to be in demand. DWS uses a grading system of A, B, or C depending upon specified demand factors. The letter C is the lowest rating of the composite job prospects. The dentist profession was considered to be an occupation in demand by only 5 of the 9 Utah Service Delivery Areas (SDA) according to the Department of Workforce Service's criteria. Of those 5 SDAs, all were given a C rating with the one exception of Davis County SDA, which received a B

rating. Total labor demand is a combination of expected growth and replacement rates of dentists.

The *Utah Job Outlook* report estimates 130 annual job openings for dentists in the state of Utah during the years 2000 to 2005. Of those 130 annual job openings, 70 are to accommodate population growth in the state and 60 are to

**Table: 9**

<b>NEW DENTIST BY YEAR</b>			
<b>Issue Year of License</b>	<b># of New Licensed Dentists</b>	<b># of New Out-of-State Licensed Dentists</b>	<b># of New In-State Licensed Dentists</b>
1990	34	8	26
1991	38	6	32
1992	34	8	26
1993	47	4	43
1994	64	11	53
1995	54	13	41
1996	82	8	74
1997	68	10	58
1998	75	18	57
1999	104	21	83
2000	113	29	84
2001	108	32	76

**Source:** DOPL Data Base

replace retiring dentists. The Governor's Office of Planning and Budget estimates an annual increase in the state's population between fifty and sixty thousand. Suggesting 70 new dentists to accommodate that increase implies a needed Utah dentist ratio significantly higher than the national average.

Figures posted by DWS conflict with other dentist workforce estimates. Despite the inflated projections, the UMEC concurs with DWS's suggestion that the dental profession in Utah is not currently an occupation of high demand.

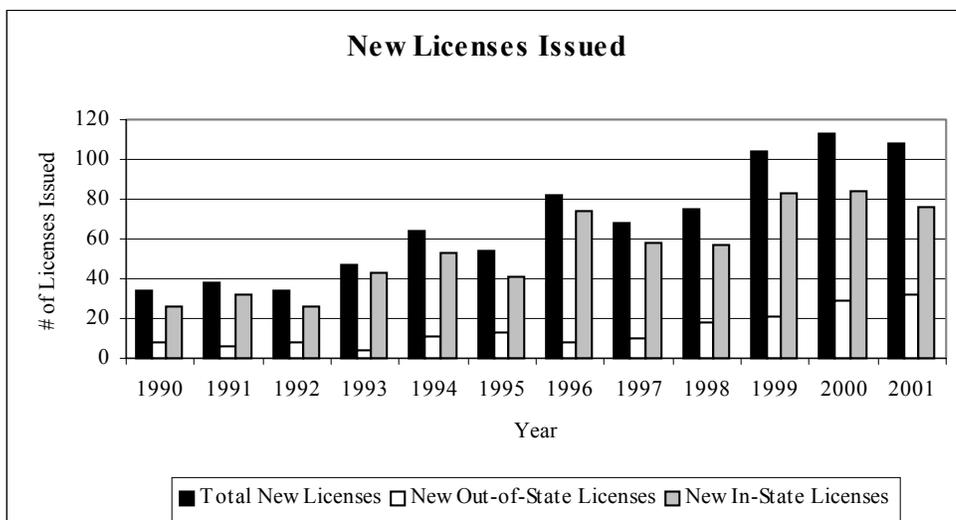


Figure 2. The chart demonstrates the gradual increase in the number of dentists applying for licensure to practice in Utah from the 1990 to 2001.

## G. Patient Demographics

The ADA conducted a national survey in 1999 to determine the demographics of dentists and their patients on a national level. All responding dentists reported that about 58.4 percent of their patients were between the ages of 15 and 64; 21.5 percent were 14 years or younger, and 20.2 percent of patients were 65 years or older. Responding specialists reported treating the youngest patient category more often than did responding general practitioners (38.3 percent vs. 18.1 percent). This however, may reflect the presence of orthodontists and pediatric dentists among the specialists, who naturally treat the youngest patients. In 1998, responding private practitioners estimated that a private insurance program covered 63.7 percent of their patients, a public assistance program covered 5.7 percent, and 30.6 percent had no insurance.<sup>16</sup> (See Table: 10) Many healthcare professionals believe that once the issues surrounding prescription drugs are adequately resolved, the next hot topic brought to the forefront of the public health debate will be the reimbursement of dental services by Medicare.

<sup>16</sup> American Dental Association. *1999 Characteristics of dentists in private practice and their patients*. Chicago, IL: American Dental Association: 2001. 47.

Over the next 28 years, Utah's senior population ( $\geq 65$ ) is expected to increase from 8.46 percent (181,805) to 13.10 percent (482,542) of the total population, which equates to a 165 percent net growth. (See Table: 11) The majority of that growth will come after the year 2015. The changing population demographics of Utah and the rest of the nation will create new opportunities for dental service providers. As more seniors retain their teeth into their later years, the demand for continued restorative care among older age

groups will increase. This may lead to calls for Medicare coverage for dental services by a vocal baby-boom generation, whose out-of-pocket dental costs will be substantial.

Table: 10

NATIONAL PATIENT CHARACTERISTICS, 1998			
	General Practitioner	Specialist	All - Weighted
Age Group	Mean %	Mean %	Mean %
14 Years or Younger	18.1	38.3	21.5
15 to 64 Years	60.6	47.6	58.4
65 Years or Older	21.4	14.3	20.2
Gender			
Female	56.0	54.9	55.8
Male	44.0	45.1	44.2
Insurance			
Covered by Private Insurance Program	63.9	62.7	63.7
Covered by a Public Assistance Program	5.7	5.9	5.7
Not Covered by an Insurance Program	30.5	31.4	30.6

Source: American Dental Association. (1999) Survey of Dental Practice. Note: Percentages do not always add up to 100% due to rounding.

As of December 2002, Medicare does not cover dental services, nor is it expected to do so any time soon. The integration of dental care services within comprehensive systems of care would seem to be a

Table: 11

AGE DEMOGRAPHIC PROJECTIONS					
Year		Age			Total
		≤ 14	15 to 64	≥ 65	
2000	Pop.	591,416	1,376,984	181,805	2,150,205
	%	27.5%	64.0%	8.5%	100%
2005	Pop.	655,947	1,503,666	195,507	2,355,120
	%	27.9%	63.8%	8.3%	100%
2010	Pop.	745,741	1,690,741	225,420	2,661,902
	%	28.0%	63.5%	8.5%	100%
2015	Pop.	815,237	1,860,573	275,196	2,951,006
	%	27.6%	63.0%	9.3%	100%
2020	Pop.	858,545	1,983,250	341,593	3,183,388
	%	27.0%	62.3%	10.7%	100%
2030	Pop.	962,102	2,239,043	482,542	3,683,687
	%	26.1%	60.8%	13.1%	100%

Source: Governor's Office of Planning and Budget -- Demographic and Economic Analysis Section UPED Model System.

natural consequence of the continued expansion of services within integrated systems. Yet, the dental profession has historically maintained an independent course and may not respond to these pressures unless attractive reimbursement rates can be established for the profession<sup>17</sup>.

## H. Population Characteristics

Utah has both urban and rural characteristics. Its main urban population lies within only four counties along the Wasatch Front. Approximately 76 percent of Utah's population resides within the Salt Lake, Utah, Weber, and Davis counties. The rural portion of the state comprises the remaining 25 counties and covers approximately 96 percent of the state's landmass.<sup>18</sup> These two uniquely contrasting characteristics create a challenge for Utah's healthcare providers in rendering the proper services to all the people of the state. Additionally, with 24 percent of the state's population spread out over 96 percent of the geographical area, rural shortages in the healthcare clinician workforce can be difficult to quantify. Some rural communities have an adequate

<sup>17</sup> Cooksey, J.D., (2000)., *Workforce Challenges for Dentists and Pharmacist*: HRSA Newsletter, January 2000

<sup>18</sup> Source: Governor's Office of Planning and Budget.

supply of dentists, while others are in critical need.<sup>19</sup> The Utah Office of Primary Care and Rural Health has the most comprehensive data on dental care access available to the state of Utah. From a macro perspective, nearly half of Utah's 29 counties have dentist-to-population ratios below the state's average. (See Table: 12)

Those populations residing in urban areas with dental insurance or have the ability to pay for dental services, tend to have adequate access to dental care. In contrast to urban communities, populations residing in rural communities find it proportionally more difficult to access dental care. This relates to the fact that many earn incomes at or below poverty levels and rely on the state Medicaid insurance program.

Some population demographics regularly experience difficulty accessing dental care because of financial barriers or other prohibitive conditions. These populations tend to consist of low-income groups, elderly persons, homeless persons, racial and ethnic minority groups, individuals with disabilities or complex health problems, and Native Americans. Rural residents also have great difficulty accessing dental care because of the location of dentists' practices.

Low-income adults and children experience higher levels of dental disease and use dental care less frequently than higher-income people do. For example, in 1996, 28 percent of lower-income people reported making a dental visit in the preceding year, compared with 56 percent of higher-income people.<sup>20</sup>

<sup>19</sup> Utah Medical Education Council December. (2000). *Utah's Clinical Healthcare Workforce Report: Achieving Balance Through 2020*. Salt Lake City, UT: State of Utah Graduate Medical Education Council.

<sup>20</sup> Data are from the Agency for Healthcare Research and Quality and are based on analysis of the Medical Expenditure Panel Survey of 1996. Figures are for people with family incomes at or below 200 percent of federal poverty level and people with family incomes above 400 percent of the federal poverty level. In 1996, the federal poverty level for a family of four was \$16,036.

Table: 12

<b>DENTISTS BY COUNTY</b>				
<b>County</b>	<b>Utah Pop. 2000</b>	<b>Total Dentists Department of Health Estimate (2000)</b>	<b>Dentists Treating Medicaid</b>	<b>Dentists per 100,000 Dept of Health (2000)</b>
Beaver	6,006	3	2	49.95
Box Elder	43,083	24	15	55.71
Cache	88,320	59	34	66.80
Carbon	21,876	13	17	59.43
Daggett	742	1	2	134.77
Davis	240,460	148	61	61.55
Duchesne	14,518	9	5	61.99
Emery	10,395	3	1	28.86
Garfield	4,609	1	2	21.70
Grand	9,106	7	4	76.87
Iron	32,564	20	17	61.42
Juab	8,332	2	2	24.00
Kane	6,338	2	0	31.56
Millard	12,047	8	6	66.41
Morgan	7,292	4	1	54.85
Piute	1,669	0	0	0.00
Rich	1,843	1	0	54.26
Salt Lake	848,083	666	243	78.53
San Juan	13,728	6	3	43.71
Sanpete	22,296	10	6	44.85
Sevier	19,160	14	9	73.07
Summit	27,095	21	4	77.51
Toole	36,816	14	7	38.03
Uintah	25,118	10	3	39.81
Utah	361,213	239	130	66.17
Wasatch	14,111	12	5	85.04
Washington	83,781	73	30	87.13
Wayne	2,617	1	2	38.21
Weber	186,987	161	94	86.10
<b>Totals</b>	<b>2,150,205</b>	<b>1,532</b>	<b>705</b>	<b>71.26</b>

Source: Bureau of Financial Services, Division of Health Care Financing, Utah Department of Health. Dentist Data Base, November 2000

The Surgeon General reported that the reason for disparities in oral health are complex and in some cases exacerbated by the lack of community programs such as fluoridated water supplies and other factors. More than a third of the U.S. population is without community water fluoridation, which is recommended as a cost-effective method for preventing cavities in children and adults, regardless

of their socioeconomic status.<sup>21</sup> Utah presently has the lowest rate of community fluoridation in the United States.

Currently Utah is in the process of implementing fluoridated water in Davis County. The fluoride water project was started in 1997. Water fluoridation was approved in April 2000. It was originally anticipated that fluoridation would have been fully implemented in Davis County by October 2002 and in Salt Lake County by October 2003. Resistance by special interest groups has caused delays in the implementation process of fluoridated water. Disbursement of inaccurate and misleading information by water fluoridation opponents has been a major hindrance. Factual information regarding water fluoridation can be found at [www.clippertoday.com](http://www.clippertoday.com) and [www.ada.org](http://www.ada.org).

## I. Health Professional Shortage Areas

Adhering to strict federal measurement requirements, the Utah Office of Primary Care and Rural Health, calculated the full-time equivalent (FTE) services rendered by Utah's dentists. Calculations are based upon several factors, including the dentist's age, hours spent providing direct patient care, and the number of assistants used. As a result of the findings, every county in Utah was designated a Health Professional Shortage Area (HPSA). As of August 2002, 4 of Utah's 29 counties (Davis, Salt Lake, Summit, and Weber) were only partially designated. The remaining 25 counties were determined to be whole county HPSAs. (Refer to Appendix A)

This evidence suggests that despite Utah's higher than average ratios, there are still significant demographic populations that do not have access to dental care. Utah is not the only state facing this conundrum. It is important to mention that the FTE calculations are based on a 40-hour workweek. According to the ADA, the average solo-practice

<sup>21</sup> GAO, Oral Health. (2000). *Factors Contributing to Low Use of Dental Services by Low-Income Populations*: September 2000

dentist works 36.7 hours a week in the office, 33.4 of those hours are spent treating patients.<sup>22</sup> If the provider works more than 40 hours a week, the FTE is automatically 1.0. If the provider works less than 40 hours a week, the FTE is less than 1.0. For example, a person who works 32 hours per week has a FTE of 0.8. If there is more than one auxiliary person working part-time (i.e., dental hygienist), the dentist FTE is then calculated for each and added together. The result is rounded to a whole number for the purpose of the weighted FTE.

This point is significant because if FTE calculations were based on the average workweek of a dentist, there would arguably be fewer HPSAs in the state of Utah. The decrease in HPSAs however would be marginal. The Utah Office of Primary Care and Rural Health, states that dentists' inclinations to not accept Medicaid patients is the most significant reason for county HPSAs. Therefore, the problem isn't a shortage of dental care providers, but rather a shortage of dentists willing to participate in the Medicaid program. (*Refer to Appendix B*) The breakdown of the 29 county HPSA designations is as follows:

- 4 – Whole County Geographic HPSA
- 21 – Whole County Low-Income HPSA
- 1 – Partial County Geographic HPSA
- 3 – Partial County Low-Income HPSA

To state it differently, only 5 counties have HPSA designations based upon a shortage of dentists or geographic location of dentists. Just 3.2 percent of the state's population lives in those 5 counties. The remaining 97 percent of the state's population reside in counties where "low-income" individuals have extreme difficulty accessing dental care. This means, that nearly 250,000<sup>23</sup> high-risk individuals are placed at a disadvantage when seeking oral healthcare.

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<sup>22</sup> American Dental Association. *1999 Survey of Dental Practice*. Chicago, IL: American Dental Association; 2000. 35.

<sup>23</sup> Figure is based on yearly estimates of total Medicaid population as calculated by The Utah Department of Health: Bureau of Financial Services Division of Health Care Financing

## J. Government Programs Affecting Access to Dental Care

Public programs have been implemented on national and state levels to address the growing concern of inadequate dental care access for disadvantaged populations. Thus far in Utah, Medicaid and the State Children's Health Insurance Program (CHIP) have been the primary vehicles used in delivering dental care to those in need. In a national study sponsored by the United States Government Accounting Office (GAO), it was reported that Medicaid and CHIP beneficiaries and other low-income people have low rates of dental visits and high rates of dental disease relative to the rest of the population.<sup>24</sup> In other words, the population with the greatest need for dental care has the most difficulty obtaining it. In Utah, approximately 20 percent of the population account for 80 percent of the state's dental problems. Utah's vulnerable residents, represent a significant portion of that 20 percent. Nationally and locally dentists have traditionally been reluctant to accept Medicaid and CHIP patients. Reasons cited are:

- Low reimbursement rates;
- Patient behavioral problems, i.e., disruptive mannerisms;
- High percentage of "no shows" (patients fail to show up for appointments);
- Cumbersome administrative work and insurance forms;
- Slow reimbursement from Medicaid.

Utah currently spends less in Medicaid dollars per capita than any other state in the nation. (*Refer to Appendix C*) Consequently, Utah's Medicaid reimbursement rates for dental services are among the lowest of all states. To offset this, proposals such as the Oral Health Improvement Act have been lobbied in order to raise the amount of money put into the Medicaid budget. The Utah Oral Health

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<sup>24</sup> GAO, Oral Health. (2000). *Dental Disease Is a Chronic Problem Among Low-Income Populations*: April 2000.

Coalition believes that if Medicaid reimbursement rates were closer to 75 percent of the 75<sup>th</sup> percentile of dental fees, more dentists would be willing to accept Medicaid patients. The interpretation of the 75 percent of the 75<sup>th</sup> percentile is: a 25% reduction of an acceptable dental fee that at least 75 percent of dentists (within a given region) would be willing to accept for a specific procedure or service.

A case management system is being piloted in the Bear River Health District and in Utah County in an effort to address patient behavioral problems, “no shows,” and other issues related to the Medicaid population. As of 2001 the State Health Department is contracting with local health subsidiaries to help implement a case management system. The Child Health Evaluation and Care (CHEC) workers set aside an allotted amount of time each week to work with Medicaid patients. These CHEC workers schedule appointments for Medicaid patients with dentists who are willing to accept Medicaid insurance. Their responsibilities then consist of educating the patients on proper office etiquette and behavior, calling to remind patients of their appointments, and helping to arrange for transportation if needed. The CHEC workers also help the dentist’s office staff prepare for the arrival and treatment of the Medicaid patient.

The Utah Department of Health, Division of Health Care Financing has recently made substantial changes to improve its billing and reimbursement processes. These processes now resemble those used by traditional private insurance companies. These steps have measurably reduced the difficulty of submitting Medicaid reimbursement claims by dental office administrators.

The UDA has agreed to encourage its members to participate in Medicaid to varying degrees, if Medicaid reimbursement rates can be increased to acceptable levels and patient behavior and “no show” rates can be improved. This endorsement would increase the utilization of dentists currently practicing

in Utah. Difficulties frequently associated with “no shows” often relate to factors such as lack of reliable transportation, lack of public transportation, difficulty obtaining childcare, and cultural differences (i.e., appointments are not mandatory in some cultural groups).

Other state, federal, and private programs have a limited impact on Utah’s disadvantaged populations and dentist workforce as well. The following programs have been created in an effort to treat the underserved populations and to compensate for the lack of dentists participating in Medicaid. These programs are:

- Salt Lake Donated Dental Services – Serves homeless, uninsured and Medicaid insured in Salt Lake County, (this is a small part-time service provider);
- Mobil Dental Program – Serves primarily Medicaid insured persons in rural and remote areas of the state. Operating under the direction of the Division of Health Care Financing, this program has a measured impact on the Medicaid insured population residing in these areas. This program treated 800 Medicaid patients in 2002;
- Dental House Call – Serves homebound people primarily in Salt Lake County. This program provides access to a very limited number of Medicaid clients;
- Community Health Center Dental Clinics – Serves Medicaid and CHIP insured and uninsured on a sliding fee scale in Salt Lake City, Ogden, Provo, Montezuma Creek, and St. George. The community health centers serve mostly the uninsured population, approximately 8% of patients served in Salt Lake City are Medicaid, and an estimated 20% of rural patients are Medicaid;
- Monument Valley Health Center Dental Clinic – Serves Medicaid, CHIP, Navajo Nation insured and uninsured on a sliding fee scale;

- Head Start – provides oral health services to children enrolled in the program who do not have dental insurance. Service is provided by volunteer dentists and residents from the dental clinic of Primary Children’s Hospital and the University of Utah, (in 1999-2000, 1,561 children received dental exams);
- Family Dental Plan – Operates 6 Medicaid dental clinics in Utah. These clinics also work to provide services to migrant farm workers and children. More than 2000 children have been screened by Family Dental Plan;
- Smile Factory – A statewide prevention based program that screens children in Title I Schools for first, second, and third grade children. During the 1999-2000 school year, 1,649 children were screened;
- Utah Blue Cross Blue Shield Caring Foundation for Children – Serves children living 200 percent below poverty but qualify for neither Medicaid nor CHIP programs. This service provided care to almost 700 children in 2002.

The UDA Access Committee, Utah Oral Health Coalition, and the National Governors Association Policy Academy (Utah Team) are working in a collaborative effort to ensure that dental care is accessible to all residents of Utah. As the following initiatives gain success (particularly as the public becomes educated to the importance of oral health), the demand placed upon Utah’s current and future dentist population is expected to increase. These initiatives are:

1. Increase Medicaid reimbursement – it is a professional belief that more dentists would be willing to treat Medicaid patients if reimbursement rates were higher;
2. Implementation of a case management system – a system of this kind could potentially ease bias barriers, social stigmas, and cultural issues that sometimes strain the dentist/patient relationship;
3. Implementation of an early intervention/prevention and education program—such a

**Table: 13**

<b>MEDICAID BILLING BY COUNTY</b>				
<b>County</b>	<b># of Medicaid Patients in County</b>	<b># of Medicaid Patients that received dental care</b>	<b>% of Medicaid Patients that received dental care</b>	<b>Medicaid Disbursements in Dollars</b>
Beaver	938	168	17.9%	\$41,428
Box Elder	3,368	959	28.5%	\$194,061
Cache	7,556	1,999	26.5%	\$396,961
Carbon	4,141	1,187	28.7%	\$380,446
Daggett	41	11	26.8%	\$1,764
Davis	10,851	4,778	44.0%	\$969,765
Duchesne	3,435	892	26.0%	\$217,290
Emery	1,727	495	28.7%	\$139,419
Garfield	607	121	19.9%	\$25,447
Grand	1,449	406	28.0%	\$104,341
Iron	4,831	1,566	32.4%	\$370,297
Juab	1,097	277	25.3%	\$58,107
Kane	725	201	27.7%	\$46,029
Millard	1,574	433	27.5%	\$78,429
Morgan	163	67	41.1%	\$14,783
Piute	225	72	32.0%	\$23,805
Rich	137	50	36.5%	\$8,750
Salt Lake	57,410	20,012	34.9%	\$4,743,785
San Juan	3,499	614	17.5%	\$137,708
Sanpete	2,655	686	25.8%	\$156,241
Sevier	3,109	946	30.4%	\$246,557
Summit	756	181	23.9%	\$41,615
Toole	3,100	712	23.0%	\$146,694
Uintah	4,380	1,211	27.6%	\$278,235
Utah	20,829	7,768	37.3%	\$1,775,703
Wasatch	889	159	17.9%	\$46,104
Washington	10,108	3,074	30.4%	\$676,924
Wayne	308	88	28.6%	\$25,246
Weber	17,351	6,879	39.6%	\$1,636,880
<b>Totals</b>	<b>167,259</b>	<b>56,012</b>	<b>33.5%</b>	<b>\$12,982,814</b>

**Source:** Bureau of Financial Services, Division of Health Care Financing, Utah Department of Health: Utah Medical Assistance 2000 Report, Annual Statistical Report of Medicaid & Utah Medical Assistance Program Fiscal Year 2000

**Note:** The Medicaid population represented in this chart is a point-in-time figure. The actual total Medicaid persons for the year 2000 was 222,360. The number of Medicaid persons that received dental care (56,012) is correct. Using these together more accurately reflects the percentage of Medicaid persons that received dental care (25.19%).

program would train new parents as to the importance of oral health for them and their newborn children.

## K. Medicaid and Dentistry

In the year 2000, Medicaid served a monthly average of 7,784 individual dental clients in Utah, costing \$12,982,816 for the year.<sup>25</sup> For the year 2000, 56,012 out of 222,360 Medicaid persons received at least one reported dental service. This means that only 25 percent of the Medicaid population received any kind of dental service. By comparison, just over 70 percent of the same Medicaid population benefited from a medical service. (See Table: 13) Costs incurred by the state and federal government for treatment of progressed dental disease is measurably more than costs incurred for preventive treatments. Nationally in 1997, only 21 percent of children eligible for Medicaid visited a dentist. The disparity among the states ranges from less than 1 percent to a high of 48 percent. This disparity between access to dental care and medical care is attributed to the low percentage of dentists willing to accept Medicaid and the population's oral health awareness.

**Table: 14**

<b>UTAH MEDICAID EXPENDITURES, 2002</b>			
<b>Services</b>	<b>All Ages</b>	<b>≤20</b>	<b>≥21</b>
Number of Recipients	65,259	40,898	24,472
Preventive	\$1,789,170	\$1,440,350	\$348,820
Avg. Cost per Recipient	\$27.42	\$35.20	\$14.25
Restorative & Repair	\$15,994,939	\$7,954,771	\$8,040,167
Avg. Cost per Recipient	\$245.14	\$194.50	\$328.55
<b>Total Cost</b>	<b>\$17,784,136</b>	<b>\$9,395,156</b>	<b>\$8,389,001</b>

**Source:** Bureau of Financial Services, Division of Health Care Financing, Utah Department of Health. Dentist Data Base, December 2002

In the year 2002, 65,259 Utah Medicaid persons received a dental service. For this population, the state spent \$1,789,170 for preventive services and \$15,994,939 for restorative and repair services. (See Table: 14) Programs created to enhance awareness of preventive oral health services could eventually save the state millions of dollars.

<sup>25</sup> Bureau of Financial Services Division of Health Care Financing. (2000). *Utah Medical Assistance 2000*. Salt Lake City, UT: Utah Department of Health; 2000. 14.

According to the Utah Department of Health, Division of Health Care Financing records, in the year 2000, only 706 of Utah's dentists reported billing one or more Medicaid patients. This would suggest that each of the 706 dentists billed an average of 11.03 Medicaid Patients a month. In reality, approximately 99 (14 percent) of the 706 dentists accepting Medicaid patients accounted for 70 percent of the total Medicaid billing. (See Table: 15) This means that 6.5 percent of the total dentist population treats over two-thirds of the Medicaid patients. Twenty percent of dentists accepting Medicaid patients submitted five or less claims for the entire year. There are currently 10 to 12 dentists rendering services to Medicaid patients under the umbrella of the Utah Family Dental Plan. These dentists alone accounted for 23 percent of all Medicaid billings for the year 2000.

This evidence strongly supports initiatives and reforms that would encourage dentists to treat Medicaid patients and to help increase access to dental services for this underserved population. An additional detriment to the health of the adult (age 21 and over) Medicaid population is the recent decision by Utah legislators to reduce Medicaid dental benefits to emergency procedures only. In accordance with current law, state Medicaid programs are not mandated to provide services to the adult population. State Officials point to the budget deficit as their reason for making the cutback. There are 32 states nationally whose Medicaid programs cover dental service for adults.

Many dentists in Utah assert that Medicaid reimbursements are simply too low to operate profitably. In some cases, the Medicaid reimbursement is so low, it actually costs the dentist to treat the patient. Sometimes the dentist will treat the patient without billing Medicaid and instead write the treatment off as a charitable service. This practice is done on a very limited basis. Dentists are often criticized for treating such a low percentage of the Medicaid population when physicians are more liberal in rendering care to Medicaid patients. Involved costs are one reason dentists treat fewer

**Table: 15**

<b>MEDICAID BILLING (Fiscal Year 2000)</b>			
<b># of Dentists who billed Medicaid</b>	<b>Range of Medicaid claims submitted per dentist</b>	<b>Medicaid billing dentists as % of total dentist population</b>	<b>% of total Medicaid billing</b>
826	0	53.9%	0.0%
42	1	2.7%	0.1%
189	2 to 10	12.3%	1.4%
117	11 to 20	7.6%	2.3%
117	21 to 50	7.6%	5.3%
77	51 to 100	5.0%	7.6%
65	101 to 200	4.2%	12.6%
72	201 to 500	4.7%	29.8%
19	501 to 1,000	1.2%	17.9%
7	1,001 to 2,000	0.5%	15.1%
1	> 2,000	0.1%	7.9%
<b>1,532</b>		<b>100%</b>	<b>100%</b>

Note: Medium = 103.5 Mode = 2 Median = 21

**Source:** Bureau of Financial Services, Division of Health Care Financing, Utah Department of Health. Dentist Data Base, November 2000

**Note:** The services rendered by the bottom 8 dentists, totaling 23% of Medicaid billings, are actually representative of the Utah Dental Program which employs 10 to 12 dentists.

Medicaid patients than physicians. The ADA reported that the average scheduled length of an appointment for a dentist is 46.5 minutes.<sup>26</sup> An informal phone survey conducted by the UMEC in the Salt Lake region found that the average time scheduled for an appointment (across various specialties) for a physician is 11.5 minutes. This information implies that physicians can treat 4 Medicaid patients to every 1 patient treated by a dentist. Additional costs to dentists include the disposable supplies used to treat patients and the compensation given to dental assistants and other chair-side help, regardless of fees being charged. These costs can be significant because of the time involved per treatment. On average, it costs a dentist more (on a percentage basis), in time, money, and

<sup>26</sup> American Dental Association. *Characteristics of dentists in private practice and their patients*. Chicago, IL: American Dental Association: 2001. 49.

opportunity costs, to treat a Medicaid patient than it does for a physician to treat a Medicaid patient.

## L. Need for Further Study

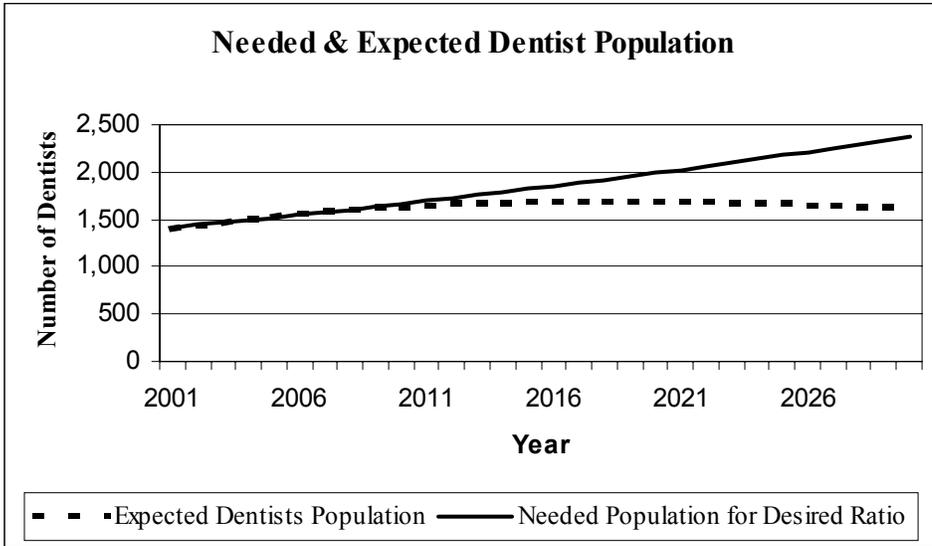
Information pertaining to the dentist workforce within the state of Utah is incomplete and in some cases outdated. Surveys administered by the ADA have been a helpful resource for evaluating the characteristics of Utah’s dental workforce on a state level. The information found in the ADA reports does not allow for the evaluation of dentists’ practices on a county and city level. Surveys or other data query techniques can be useful tools in determining:

1. Characteristics of the dentist population in the state of Utah;
2. Traits and features of dentists’ practices;
3. Trends in employment availability and market saturation/opportunities by time and geography;
4. Characteristics and traits of dental patients;
5. Workforce needs and projections;
6. Estimated figure of excess capacity to provide dental service;
7. Schools that supply significant numbers of dentists to Utah;
8. Reasons Utah students return to the state after completing dental school.

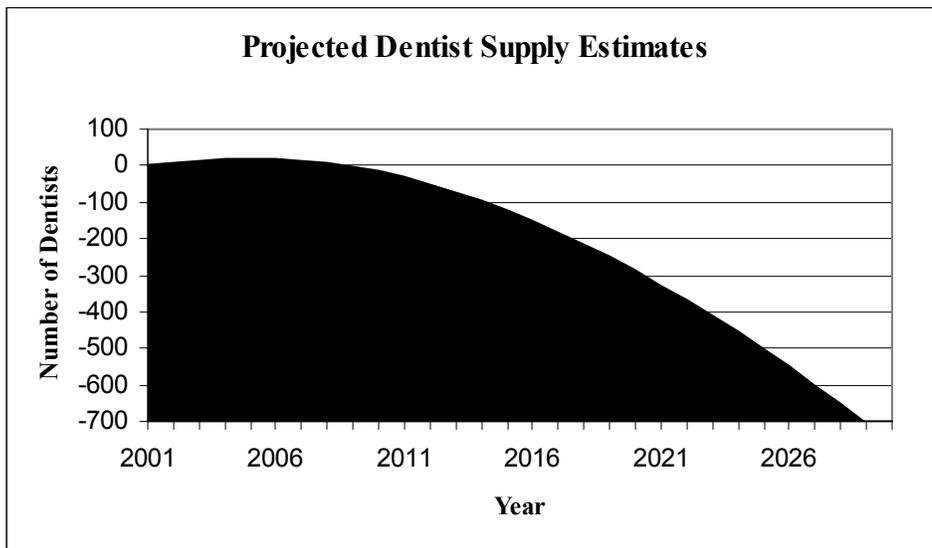
## M. Conclusions

The UMEC supports the UDA’s professionally active dentist population estimate of 1,417, and can find no empirical evidence to suggest this figure to be implausible. The UMEC further believes that the current dentist population is adequate to meet the state’s prevailing dental care needs.

Given present market conditions, a dental shortage in Utah is unlikely to occur until the year 2009. (See Figure 3.) Prior to this date, it is



**Figure 3. Calculations projecting supply and demand of dentists estimate a potential decline in the dentist workforce starting in the year 2009.**



**Figure 4. Under current conditions the projected dentist population will experience a 7% shortage in the year 2015 and a 32% shortage in the year 2030.**

conceivable that Utah will maintain an adequate dentist workforce. Utah will need 246 more dentists in the year 2010 to provide year 2000 levels of access. (Refer to Appendix D) This estimate assumes that recruitment and retirement rates will remain relatively constant and that the current dentist-to-population ratio is satisfactory. After the year 2009, Utah will likely experience a perpetual shortage (See Figure 4.) unless addressed by initiatives aimed to

increase the migration of dental graduates to Utah. Possible programs to consider are:

- Expand and develop relationships with state and private dental schools to create a pipeline for Utah dental students;
- Enhance incentives offered to dentists as encouragement to practice in rural and underserved areas of the state;
- Establish a dental school with emphasis placed upon meeting state needs;
- Create new market opportunities that will attract dentists to Utah by increasing Medicaid reimbursement to an acceptable and lucrative level.

Currently, evidence suggests that there are a sufficient number of dentists accepting private insurance and self-pay patients in Utah. For this population segment, dental care access is limited only by the distribution of the dentists themselves, particularly in rural areas. Because of the array of economic and market conditions found in the state, dentists are inclined to establish their practices in those locations that have the highest probability of success and profitability. Unfortunately, Utah's

rural communities tend to be underserved, as dentists gravitate toward the more favorable and lucrative urban markets. Presently, there are not enough dentists accepting Medicaid patients. This stigma is paramount throughout the state and much of the nation.

The UMEC believes that dentists have a level of excess capacity that could be used to treat Medicaid and other disadvantaged populations, but choose not

to do so for various economic and social reasons. Programs and policies that benefit, encourage, and compensate dentists who serve disadvantaged persons are needed if Utah's entire population is to have satisfactory dental care access.

Initiatives taken to increase Medicaid reimbursement rates for dental services are needed. If successful, these initiatives will increase the utilization of Utah's dentist workforce. Currently,

only 25 percent of the Medicaid population in Utah is being treated. Despite the size of Utah's dentist workforce, it is not adequately meeting the needs of the population. Dental characteristics such as the number and type of specialists, distribution of practices, and providers serving low-income/Medicaid patients, needs to be addressed in order to ensure that Utah has a dentist workforce able to meet the needs of its growing and diverse population.

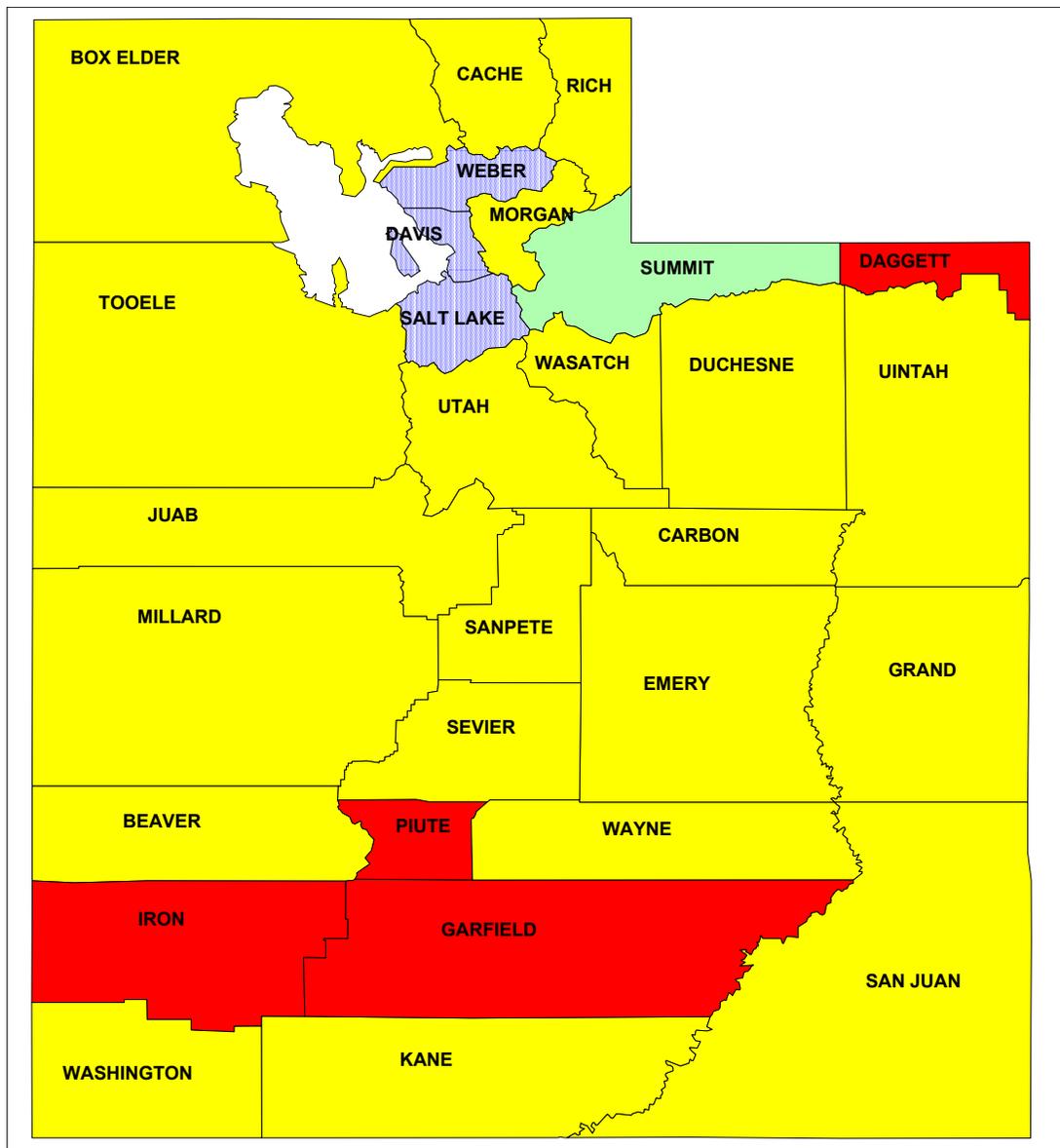
APPENDIX A

MAP OF DENTAL HEALTH PROFESSIONAL SHORTAGE AREAS

Prepared by Kathleen Hardy MPA, Research Analyst  
Utah Office Of Primary and Rural Health

**Utah Dental Care HPSAs  
By County and Type of HPSA**

- Whole County Geographic HPSA
- Whole County Low-Income HPSA
- Partial County Geographic HPSA
- Partial County Low-Income HPSA



## APPENDIX B

### DENTAL HPSA PROCESS AND CRITERIA

Prepared by Kathleen Hardy, Research Analyst  
Utah Office of Primary Care and Rural Health

#### TYPES OF HPSA DESIGNATIONS:

There are three basic types of HPSA designations.

Area Designations – (also known as geographic designations) are based on the number of providers that are serving a defined geographic area, usually a county or part of a county.

Population Group Designations – are based on the number of providers that are serving a specific group of people in the geographic area. Utah normally uses the “low-income” group (people at or below 200% of poverty). The other possible population groups are generally included in the low-income group and are harder to document. The other possible population groups are: Medicaid Eligible Population, Poverty Population (people at or below 100% of poverty), Homeless Population, Migrant/Farm worker Population, and Native America/Native Alaskan Population.

Facility Designations – are based on the number of providers that serve the population of a specific facility. Currently Utah has facility designations only for the Utah State Prison and Central Utah Correctional Facility.

#### CRITERIA:

In order to be designated a Dental HPSA, the “rational service area: to be designated must meet one of the following criteria:

Geographic: Area has a population to provider ratio greater than or equal to 5,000 to FTE. This criterion is generally the first approach tested.

- High Needs Geographic: (rarely used) Area has a population to provider ratio greater than or equal to 4,000 to 1 FTE and one of the following:
  - 20% of the population has incomes at or below 100% of the Federal poverty level
  - 50% of the population does not have fluoridated water
  - Meets insufficient capacity criteria

Low-Income Population: Area has a population to provider ratio greater than or equal to 4,000 to FTE. More than or equal to 30% of the area’s population must have incomes that are at or below 200% of the Federal poverty level.

Corrections Facility: Internee to provider ratio is greater than or equal to 1,500 to 1 FTE.

#### RATIONAL SERVICE AREA:

The Shortage Designation Branch (SDB) requires that the proposed area be a “rational service area.” For dental designations Utah uses both whole county and part county criteria. Partial counties are used for areas where part of the county is well served, but the rest of the county has none or few dentists serving the area. SDB also requires the use of partial counties in “metropolitan areas” (Wasatch Front). Combining adjacent census tracts with similar geographic or demographic characteristics into service areas creates the partial counties. Even though we are only asking for designation of part of the county, we must survey the dentists in the entire county.

#### PROVIDER SURVEY:

SDB requires a survey of all the general and pediatric dentists in the county. The Bureau’s database generally has most of the dentists in the

rural counties from previous surveys. Current data lists of Utah dentists in urban areas are not complete, although efforts are presently being made to update the list of urban dentists. The list of dentists in the county from the database is updated by looking in the “yellow pages” of the county or through QwestDex on the web.

Once a complete listing of the general and pediatric dentists in the county with their addresses and phone numbers is available, each dentist is then contacted by means of a phone survey. SDB requires the age of each dentist, number of auxiliaries used, number of hours spent providing direct services (no time teaching, research, or administrative duties), and the percentage of their patients that pay through Medicaid and pay on a sliding fee schedule. The dentists are also asked their gender, race/ethnicity, and what languages they can provide services in. This information is used to create a list of dentists that can serve minority populations.

Based on the information provided, a full-time equivalent (FTE) is assigned to each dentist (between 0.1 and 1.5). The FTEs of all the dentists in the county or service area are added to get a total for the county/service area. The civilian resident population or population under 200% of poverty is divided by the total FTE to get the ratio of people to 1 FTE. If the ratio is larger than the minimum defined in the criteria, an application for designation as a dental care HPSA is prepared.

## **HPSA DESIGNATION APPLICATION:**

### **The HPSA Designation Application contains:**

List of Dentists with the name, address, age number of auxiliaries, hours of direct patient care per week, percentage of Medicaid and Sliding Fee Schedule patients, and calculations to determine the individual FTE. Individual FTEs are added together to get the total FTE for the service area.

Population Data contains variables such as population density, the total number of people by race and Hispanic, the number of births and deaths by race and Hispanic, Infant mortality rate, number and percentage of people below 100% of poverty and below 200% of poverty, number and percentage of males and females, number and percentage of people by age groups, population to dentist ratios, etc.

Contiguous Area Resource Analysis that provides the following Information about all the surrounding counties/service areas: County/service area name, its location in relation to the area to be designated (north, east, etc.) the name of the city that is the farthest away from the main city in the proposed HPSA area, the number of miles between those cities, how long it takes to drive between the cities, whether the contiguous county/service area is urban or rural, the HPSA status of the contiguous county/service area, and notes that explain why the contiguous service area or county is unable to provide service to the people in the proposed service area/county.

A county or service area may be considered unable to provide dental care to the area to be designated for one of the following reasons:

- Counties/service areas that are already designated as a HPSA or are proposed for HPSA status are considered unable to provide services because they already have a shortage of dentists.
- If the travel time is over 40 minutes for dental care they are not eligible to serve the people in the area to be designated.
- If the contiguous area has a ratio over 3,000 population to 1 FTE dentist, it is considered over utilized and not eligible to serve the people in the area to be designated.

HPSA designations are reviewed at least once every three years. If requests for redesignations are not made, the area will have its designation withdrawn.

APPENDIX C

<b>State Medicaid Expenditure per Resident and Federal Matching Revenue Amounts per Resident for Fiscal Year 2001</b>							
<i>(Ranked by state Medicaid spending per capita, least to greatest)</i>							
<b>Rank</b>	<b>State</b>	<b>State Medicaid Spending Per Capita</b>	<b>Federal Medicaid Revenue Per Capita</b>	<b>Rank</b>	<b>State</b>	<b>State Medicaid Spending Per Capita</b>	<b>Federal Medicaid Revenue Per Capita</b>
	<b>U.S. Average</b>	<b>\$321</b>	<b>\$456</b>	26.	Kansas	\$258	\$394
1.	Utah	\$117	\$282	27.	North Carolina	\$277	\$489
2.	Nevada	\$149	\$173	28.	Nebraska	\$289	\$442
3.	Montana	\$157	\$421	29.	Ohio	\$298	\$458
4.	Idaho	\$167	\$396	30.	New Hampshire	\$300	\$370
5.	Arizona	\$170	\$355	31.	Missouri	\$310	\$540
6.	Oklahoma	\$177	\$448	32.	Wisconsin	\$215	\$458
7.	Alabama	\$178	\$466	33.	Maryland	\$317	\$327
8.	Wyoming	\$186	\$349	34.	Illinois	\$319	\$340
9.	South Dakota	\$188	\$442	35.	Alaska	\$324	\$650
10.	Virginia	\$193	\$237	36.	Oregon	\$327	\$498
11.	Mississippi	\$194	\$672	37.	Michigan	\$328	\$443
12.	Arkansas	\$194	\$520	38.	California	\$331	\$389
13.	South Carolina	\$198	\$536	39.	Maine	\$358	\$707
14.	Texas	\$202	\$347	40.	Tennessee	\$359	\$628
15.	North Dakota	\$204	\$473	41.	Washington	\$363	\$407
16.	West Virginia	\$215	\$669	42.	New Jersey	\$365	\$437
17.	New Mexico	\$218	\$624	43.	Vermont	\$381	\$659
18.	Indiana	\$222	\$424	44.	Delaware	\$387	\$407
19.	Iowa	\$222	\$375	45.	Minnesota	\$391	\$423
20.	Florida	\$230	\$312	46.	Pennsylvania	\$397	\$501
21.	Louisiana	\$230	\$677	47.	Connecticut	\$449	\$496
22.	Colorado	\$231	\$256	48.	Massachusetts	\$500	\$549
23.	Kentucky	\$236	\$586	49.	Dist. Columbia	\$502	\$1,228
24.	Georgia	\$236	\$378	50.	Rhode Island	\$210	\$640
25.	Hawaii	\$252	\$300	51.	New York	\$785	\$858

**Source:** Medicaid expenditure data based on CMS form 64 reports for FY 2001. Population data are based on Census estimates of the state resident population in 2001.

**Note:** State Medicaid spending is based on the state share of Medicaid expenditures, excluding DSH payments, since the state share of DSH payments is typically not borne by the state. Federal revenue is based on Federal Medicaid matching payments, including DSH.

## APPENDIX D

## APPENDIX E

<b>POPULATION PROJECTIONS FOR COUNTIES AND STATE</b>								
<b>COUNTY</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>AARC</b>
<b>Beaver</b>	6,385	6,595	9,824	6,938	7,558	8,477	9,653	1.6%
<b>Box Elder</b>	44,857	45,819	46,829	47,896	53,855	63,209	70,755	1.7%
<b>Cache</b>	90,993	92,913	95,006	96,904	708,150	127,896	143,040	1.6%
<b>Carbon</b>	22,219	22,483	22,751	22,951	24,091	25,732	27,248	0.7%
<b>Daggett</b>	753	759	768	770	813	898	937	0.8%
<b>Davis</b>	247,457	251,713	256,082	261,297	292,173	346,203	392,003	1.6%
<b>Duchesne</b>	14,799	14,970	15,166	15,253	16,247	18,216	19,212	0.9%
<b>Emery</b>	10,499	10,598	10,699	10,772	11,243	12,322	12,984	0.7%
<b>Garfield</b>	4,756	4,835	4,926	5,030	5,602	6,563	7,764	1.8%
<b>Grand</b>	9,135	9,235	9,305	9,349	9,665	9,989	10,288	0.4%
<b>Iron</b>	34,217	35,084	36,046	36,911	41,656	49,892	60,191	2.1%
<b>Juab</b>	8,794	9,019	9,250	9,435	10,572	12,589	14,338	1.8%
<b>Kane</b>	5,989	6,213	6,459	6,730	8,238	11,243	14,924	2.9%
<b>Millard</b>	12,275	12,381	12,491	12,539	13,057	13,747	14,167	0.5%
<b>Morgan</b>	7,437	7,564	7,696	7,856	8,829	10,659	12,435	1.8%
<b>Piute</b>	1,724	1,748	1,774	1,789	1,889	2,009	2,062	0%
<b>Rich</b>	1,858	1,869	1,880	1,892	1,979	2,084	2,131	0.5%
<b>Salt Lake</b>	867,700	879,294	894,896	914,190	1,028,508	1,223,218	1,383,907	1.6%
<b>San Juan</b>	14,011	14,211	14,412	14,573	15,513	16,847	18,063	0.9%
<b>Sanpete</b>	23,011	23,349	23,694	23,920	25,571	28,177	30,242	1%
<b>Sevier</b>	19,800	20,106	20,421	20,635	22,155	24,598	26,498	1.1%
<b>Summit</b>	28,591	27,577	28,224	29,176	35,202	48,207	60,852	2.7%
<b>Toole</b>	38,651	39,852	41,075	42,450	50,333	65,852	80,938	2.7%
<b>Uintah</b>	25,324	25,483	25,688	25,712	26,801	29,058	29,889	0.6%
<b>Utah</b>	377,084	285,793	395,972	408,220	469,691	559,907	677,304	2.1%
<b>Wasatch</b>	14,980	15,464	15,997	16,615	19,758	24,806	31,236	2.7%
<b>Washington</b>	89,153	92,657	96,440	100,447	122,272	165,346	218,198	3.2%
<b>Wayne</b>	2,782	2,865	2,949	3,020	3,449	4,275	5,078	2.2%
<b>Weber</b>	190,911	194,051	197,581	201,850	227,032	271,369	307,350	1.7%
<b>STATE OF UTAH</b>	<b>2,216,175</b>	<b>2,254,500</b>	<b>2,301,301</b>	<b>2,355,120</b>	<b>2,661,902</b>	<b>3,183,388</b>	<b>3,683,687</b>	<b>1.8%</b>

AARC = Average Annual Rate of Change 2000-2030

Sources: Associations of Government; Governor's Office of Planning and Budget





# UMEC

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