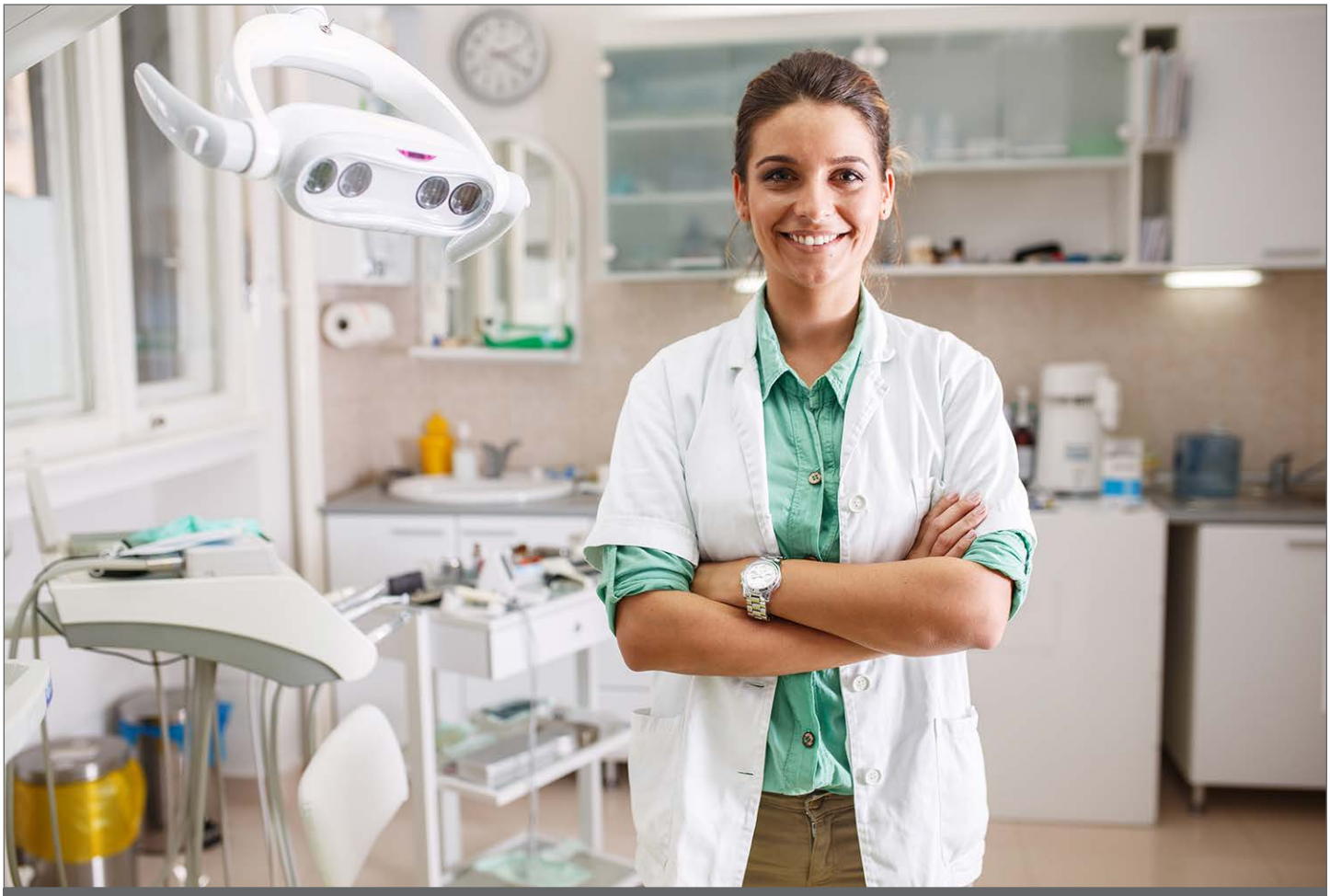
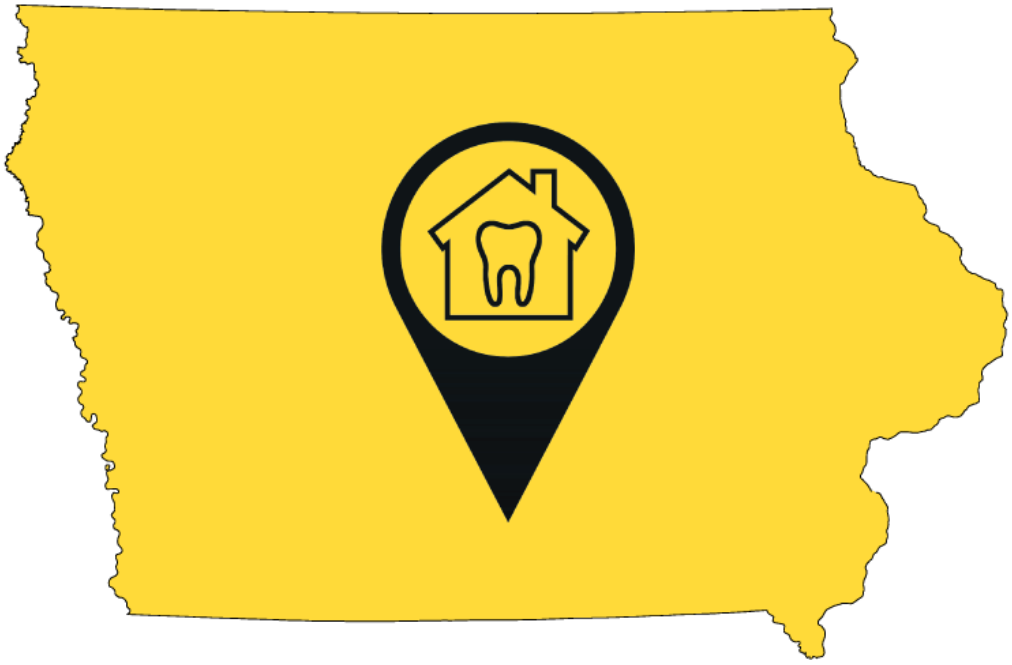
Chapter 3: Dentist Workforce Monitoring in Iowa



Iowa Dentist Workforce Atlas, 1997-2016: 20 Years of the Iowa Dentist Tracking System



History of Dentist Workforce Monitoring in Iowa

Iowa has keen respect for the importance of health workforce monitoring for planning and research. The state has collected county-level data about various health care professions since at least the 1960s.

Fifty years ago, Donald Galagan, dean, University of Iowa College of Dentistry and former assistant surgeon general of the US Public Health Service, made the following observations about the dentist workforce in a guest editorial for the *Iowa Dental Journal* (1968):

- "The present number of active dentists (about 1250) is 22% less than it was in 1940, when 1,623 active dentists served a smaller number of people."
- "Over the past forty years the number of graduates from the College of Dentistry staying in Iowa has slowly decreased from about 85% to about 55% at the present time."
- "Non-Iowa graduates do not constitute an important source of practitioners for the state."
- "Nearly one-half of Iowa's practicing dentists are over 50 years old, and 1 in every 7 now is at least 70 years old."
- "The University of Iowa, in collaboration with the Iowa State Dental Association, has initiated a "Practice in Iowa" program in order to persuade more graduates to remain in the state."
- Noted plans to expand from 62 to 96 graduates when a new facility was available (in 1973).

As Dean Galagan indicated, there had been an increase in class size secondary to an infusion of federal funds to construct newer dental education facilities nationwide, including the construction of a new building for the University of Iowa College of Dentistry. However, there was some concern by the dental profession that the increase in class size would oversaturate the dental market.

After a decade of increasing class sizes throughout the country, this expansion came to an abrupt halt in the 1980s. There was a concern within the profession due to the confluence of several factors – most notably the greater than anticipated increases in community water fluoridation coupled with a decline in permanent tooth caries prevalence among schoolchildren. Additionally, the Federal Trade Commission had removed restrictions for dental advertising and there were extreme fluctuations in the silver and gold market, both of which were the predominant metals used for dental restorations. Corporate dental offices in malls, including locations within Sears department stores, were beginning to appear. These trends, combined with a very small number of dentist bankruptcies, motivated dental alumni to apply sufficient political force such that dental schools reduced class sizes to previous levels.

During this time period the Iowa Dental Association convened an ad hoc Manpower Committee (1978-1987) that diligently conducted annual reviews to monitor several trends, including numbers of patient visits and new patients, changes in office personnel, and practice busyness (see Tables 13 and 14 in Appendix). Similar to the national scene, there was concern within the Iowa dentist community about maintaining balance between disease prevalence, demand for care, and the number of dentists available to meet this demand. By the late 1980s, this ad hoc committee was disbanded. However, the University of Iowa College of Dentistry attempted to maintain some of these voluntary monitoring efforts.

By the mid-1990s, the Office of Statewide Clinical Education Programs (University of Iowa College of Medicine) reinitiated efforts to monitor the dental profession similar to physician monitoring that had been ongoing since the 1970s. Infused with state funds, the Iowa Dentist Tracking System was created.

About the Tracking Systems

The Office of Statewide Clinical Education Programs (OSCEP) is administratively located within the University of Iowa Carver College of Medicine, where it tracks the supply and distribution of several health professions. OSCEP has been conducting continuous inventory of physicians in the state since 1977. In 1994, the Iowa General Assembly approved a state-supported program, the Primary Care Initiative, to increase the number of primary care physicians educated in the state. During the following year, the initiative was expanded to include measures that would help legislators and public health officials understand the status of other health professions in the state. Some of the associated funds were designated to establish and maintain the Iowa Health Professions Inventory, a series of databases tracking Iowa's physicians, dentists, pharmacists, physician assistants, and advanced nurse practitioners (Figure 1). Although similar information is collected across professions, each data set is autonomous. OSCEP is responsible for the daily operations of the tracking systems.

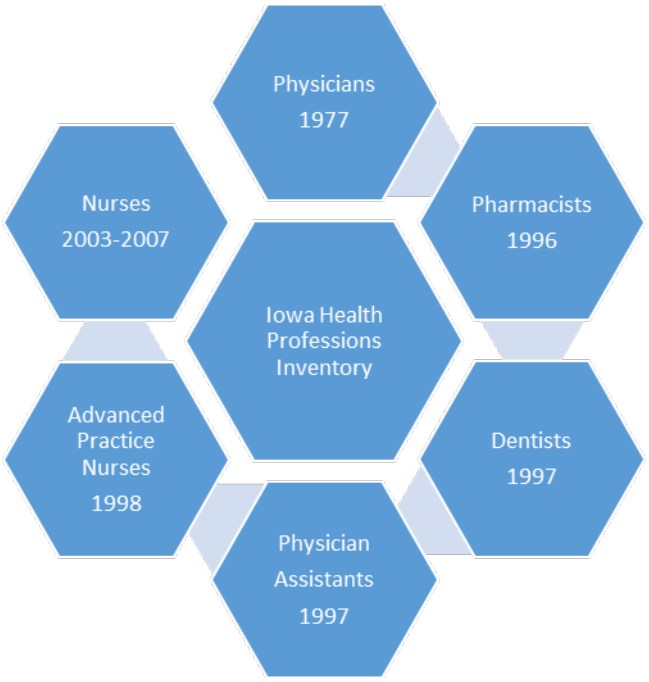


Figure 1. Iowa health professions tracking systems

OSCEP works with the respective professional state boards to share information about changes in the practitioner's status (e.g., non-renewal of license, loss of license, inactive status) and any new information collected by an electronic news-clipping service. The service identifies items news releases such as those related to announcements of new associates, office closures, and obituaries. OSCEP also shares findings with the Bureau of Oral and Health Delivery Systems, Iowa Department of Public Health, which aids in preparation of applications for Medical and Dental Health Shortage Area designations.

The dentist tracking system was initiated in 1997; the long-standing Iowa Physician Information System served as the model. By 1998, pharmacist, physician assistant, and advanced nurse practitioner tracking

systems were also operational (Table 1). The state tracking systems have four principal uses: recruitment (e.g., targeting locations for present and possibly future shortage areas), administrative and planning (e.g., shortage area analysis, grant applications, market research), workforce analysis (e.g., supply and distribution, turnover rate, attrition, primary and satellite sites), and research (e.g., impact of sex on workforce, impact of foreign-trained physicians).

Table 1. Establishment of Iowa health professions tracking systems

Provider	Established	Number of Providers at Baseline
Physician	**1977**	**3,022**
Pharmacist	**FY96***	**2,320**
Dentist	**FY97**	**1,443**
Physician assistant	**FY98**	**394**
Nurse advanced practitioner	**FY98**	**553**

*Iowa's state fiscal year (FY) is July through June. FY97 indicates that the Iowa Dentist Tracking System was operational between July 1996 and June 1997.

In the mid-2000s, OSCEP explored the possibility of creating and maintaining a tracking system for nurses. However, the relative size of the nursing profession combined with high job mobility and the high prevalence of multiple jobs made this endeavor cost prohibitive. Although the dental hygiene profession is relatively small compared to nursing, these professions share similar features, including a substantial proportion of each working for more than one provider.

The monitoring process is guided by a dental advisory committee, consisting of representatives from the Iowa Dental Association, Iowa Dental Board, and the University of Iowa College of Dentistry. The advisory committee provides input concerning selection of specific data elements to be collected, definition of data fields for specific elements, identification of other potential data sources, and adoption of user guidelines and policies for this tracking system. The advisory committee meets annually to review data from the previous calendar year and to suggest modifications. A summary report is published annually and made available to the Advisory Committee for comments prior to being available on the OSCEP website.

The primary purposes of the annual reports are to describe the Iowa Dentist Tracking System and to identify potential state trends in dentist workforce composition. When it is appropriate, comparisons are made with the other professional tracking systems. IDTS provides state data for researchers interested in studying the supply side of the dentist workforce and offers a data collection model that may be useful to other less urbanized states. IDTS characterizes the health professional population (e.g., age, sex, practice arrangements, number of hours worked), monitors trends, and facilitates research on the dentist workforce. Because each tracking system is longitudinal, users are able to track changes in supply and geographic distribution.

This atlas provides a descriptive analysis of the state's dentist workforce for 20-year period since its inception, 1997 through 2016. Topics of particular interest include changes in the composition of dentist sex, age, hours worked, practice arrangements, and retention of University of Iowa graduates in the state. The atlas also assesses geographical trends in the Iowa dentist workforce distribution, including distribution relative to other health care providers. Findings can be used to assist with recruitment and retention efforts, particularly in rural areas of Iowa.

Development

Upon creation of the Iowa Health Professions Inventory, OSCEP staff constructed a dentist survey for the initial round of data collection in 1997 to collect demographic, educational, and practice/employment information. OSCEP and its advisory committee worked diligently to notify licensed dentists that such a monitoring system was being developed and would commence in that same year. OSCEP collaborated with the Iowa Dental Board (IDB) and the state and local dental societies to locate all practice sites. IDB provided some basic information for the eventual database, including license number and date of issue, date of birth, and sex. This provided the foundation for inquiring about additional relevant practice information.

Because the address on file with the IDB could have been for a dentist's office, residence, or post office box, OSCEP took additional steps to identify practice addresses. They purchased all Iowa phone directories, contacted potential employers of dentists (academic institutions, hospitals, insurance companies, and public health and other state and local agencies), scoured through a news-clipping service for information about new practitioners, and performed an online search to locate dentists and their practice sites.

Using these preliminary data, OSCEP staff mailed a partially completed personalized questionnaire to each dentist. An accompanying introductory letter included a list of advisory committee members and informed dentists about the collection of some basic monitoring variables. Dentists were asked to verify the completed information and complete the remainder of the questionnaire. Dentists were notified that OSCEP staff would contact them via telephone to complete the remainder of the survey. Dentists were encouraged to contact advisory committee members, the Iowa Dental Association, or OSCEP staff if they had questions about the survey.

When contacted by telephone, dentists were asked to validate licensure information and were asked the remaining questions. This approach helped to legitimize the data collection process. If there was difficulty in contacting the dentist, the cover letter and survey form were mailed 2 additional times to convey the importance of this project. Eventually, all known dentists were contacted and completed the questionnaire. Most importantly, a contact person in each office was identified to facilitate follow-up.

Besides confirming licensure information, dentists were asked to provide other demographic data, including birth state. OSCEP staff also asked each dentist to confirm the dental school attended and graduation year, along with asking about any advanced dental education (i.e., specialty, general practice residency, or advanced education in general dentistry) and the completion year of that educational program. Employment data included information about principal professional activity (e.g., private practice, government, academia, community health center, Veterans Affairs, hospital), address of primary and additional practice locations, contact information, and practice arrangement. Practice arrangement was initially classified as either solo, associateship, 2-member partnership, or group practice (single or multi-specialty). With the rise in the number of corporate practices throughout the

country, OSCEP added an additional category to the practice arrangement variable in 2011. Other practice information included employment start date, hours worked per week, and weeks worked per year.

The first cycle of data collection for dentists was completed in 1997. For several years, data were collected about dental auxiliaries employed in dentists' offices. The advisory committee proposed that dental auxiliary data be discontinued in 2008 due to substantial anecdotal evidence that there was an over-count (Figure 2). For example, dental hygienists who worked in multiple offices were being counted in each office.

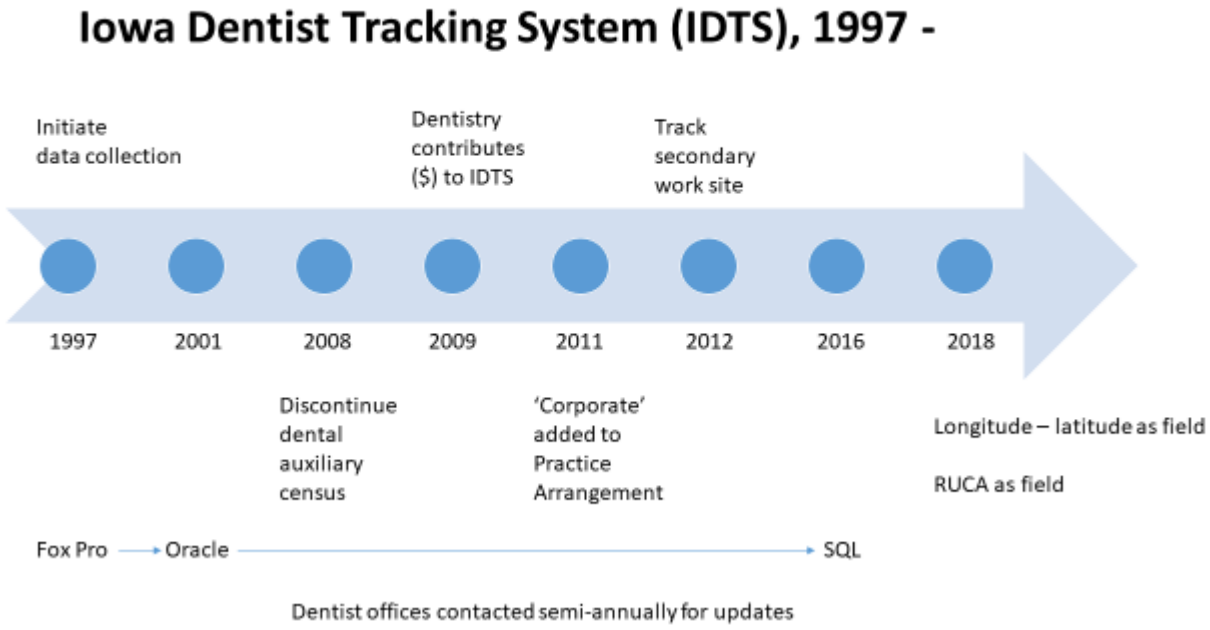


Figure 2. IDTS timeline

Initially, funding for each health profession's tracking system came from state funds associated with the Iowa Primary Care Initiative. When these state funds were reduced in 2009, dentistry and pharmacy sought other sources. The University of Iowa Colleges of Dentistry and Pharmacy both contributed to partial funding of OSCEP staff. In the case of dentistry, the Iowa Dental Association also contributed some funding for approximately 4-5 years.

For several years the advisory committee requested additional information about the location of any additional work sites beyond the primary practice location. This variable was added in 2012.

With the availability of computer software for geocoding practice location, a field was added to the data base that provided the longitude and latitude of the practice. OSCEP also introduced a field to identify practice urbanicity, using Rural-Urban Commuting Area (RUCA) codes.

The lower portion of Figure 2 shows the shift in relational data-basing during this time period.

Maintenance

OSCEP keeps the database current by collaborating with the Iowa Dental Board to identify new dentists and individuals who have notified the board about a change in address or practice status (e.g., active to inactive). OSCEP continues its subscription to an Iowa electronic newspaper service to identify those entering or leaving the system via relocation or death. Additionally, OSCEP corresponds with institutions where there are regular transitions, such as the University of Iowa College of Dentistry and other public facilities. Once a dentist is included in the database, OSCEP staff contacts the dentist's office semiannually by telephone to update information. For instance, staff inquire about changes with secondary or tertiary practice sites or practice arrangement, such as whether the practitioner still employs an associate.

OSCEP also asks about changes in the number of hours practiced per week and weeks worked per year since their previous contact with each dentist. From its onset the Advisory Committee operationally defined part-time employment as dentists who practice less than 32 hours per week. Dentistry is the only Iowa tracking system to define full- and part-time. Other tracking systems record only number of hours worked per week. Previously, Bognanno et al (1976 Survey of Dentists, unpublished data from the Iowa State Department of Health, December 1976) used 35 or more hours per week to define full-time.

Collecting information about hours per week and weeks per year helps account for individuals who are temporarily absent from the workforce (e.g., due to health or pregnancy) and dentists in phased retirement. The master file is updated monthly, with an annual list recorded as of December 31 of each year.

The University of Iowa College of Dentistry was fortunate to have received funding for several years to assist with the development of a database suitable to address research questions. Delta Dental of Iowa Foundation provided seed funds in 2007 to establish the original research database. Subsequently, the College of Dentistry received 6 years of federal funding from the US DHHS Health Resources and Services Administration, in part, to study the Iowa dentist workforce. This atlas was funded by a Delta Dental of Iowa Foundation grant to commemorate the 20th anniversary of the first IDTS report.

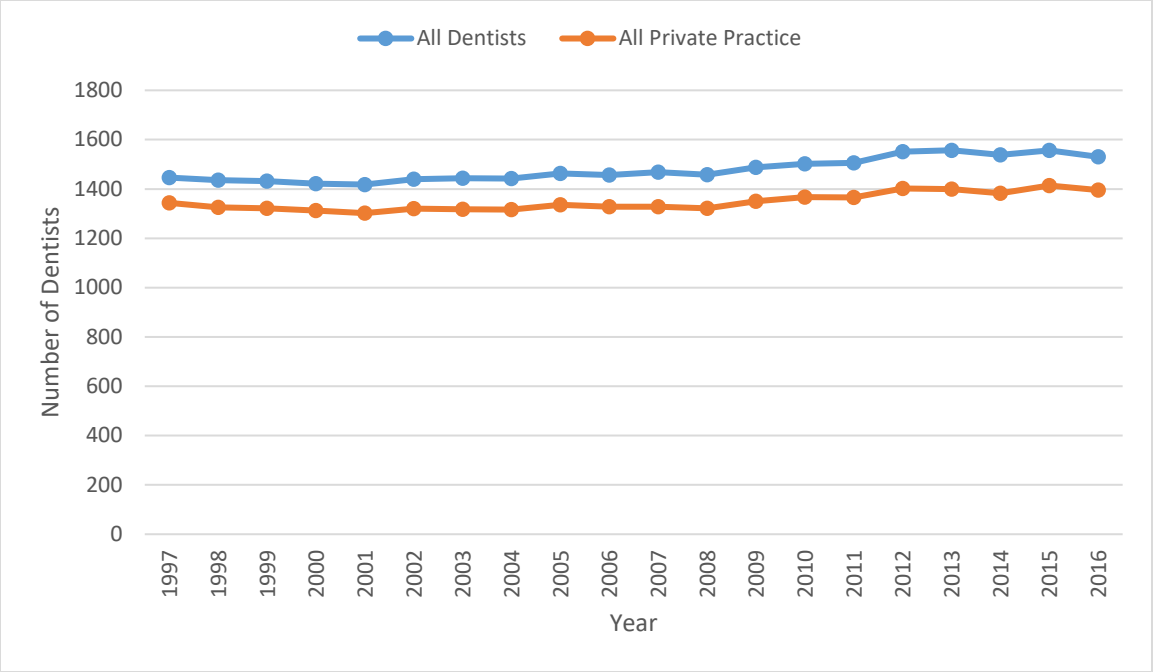


Figure 3. Dentists in Iowa, active versus private practice, 1997-2016

Active Dentists

In 2016, there were 1,530 dentists actively practicing in Iowa. This is considerably lower than the number of dentists with an Iowa license, many of whom do not practice in the state. For example, in 2016 the Iowa Dental Board indicates that there were 2,086 dentists with a full license,[2] along with 60 dentists with restrictive faculty licenses and 64 dental residency licenses.[3]

Private Practice Dentists

The percent of active dentists in private practice has remained stable during the 20-year period between 1997 and 2016. In 1997, 92.9% of active dentists were private practitioners, while 91.2% were in private practice in 2016.

This proportion ranged from a low of 89.9% (2013 and 2014) to a high of 92.9% (1997).

[2] DHHS, Health Resources and Services Administration. The US health workforce, state profiles. https://bhw.hrsa.gov/health-workforce-analysis/state-profiles. Published August 2018. Accessed January 8, 2019.
[3] Iowa Dental Board. Iowa Dental Board 2017 annual report. https://dentalboard.iowa.gov/sites/default/files/documents/2019/01/2017_annualreport_final.pdf. Published April 16, 2018.

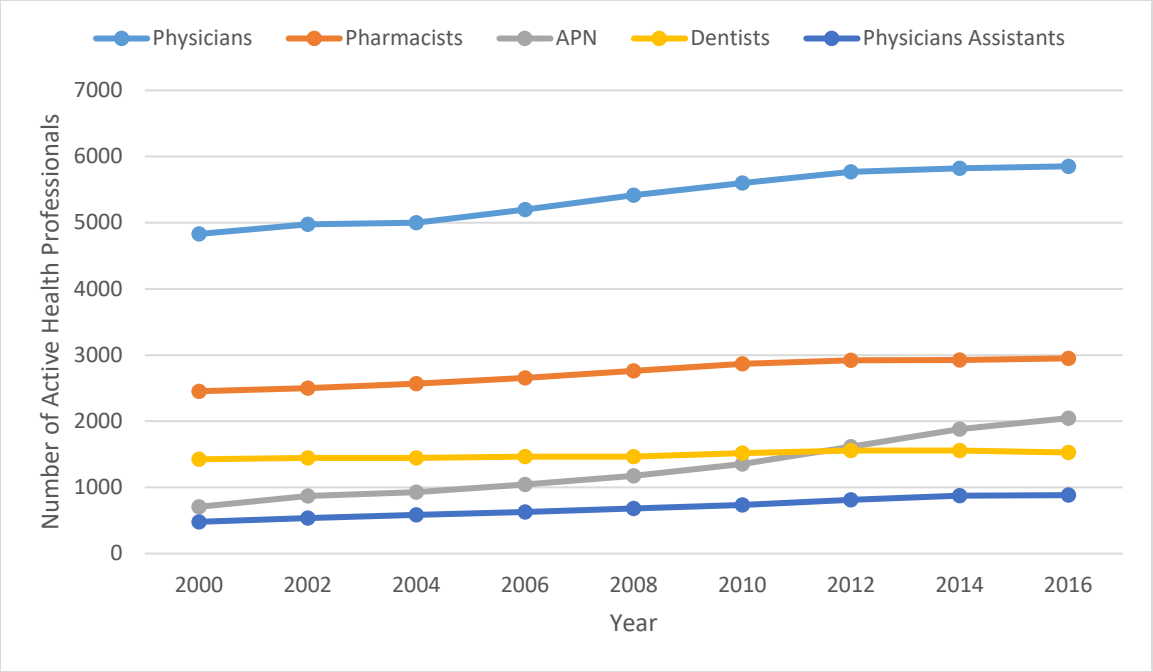


Figure 4. Active health professionals in Iowa, 2000-2016

Although 4 of the tracking systems were initiated in the late 1990s, all systems were not fully operational until 2000. Thus, this chart displays findings from 2000 through 2016.

The number of physicians increased by 21% from 2000 to 2016 and pharmacists increased by 20%. advanced practice nurses (APN) and physician assistants had the largest gains with 189% and 84% increases, respectively. The dentist workforce had the smallest growth (7%) among all professions.

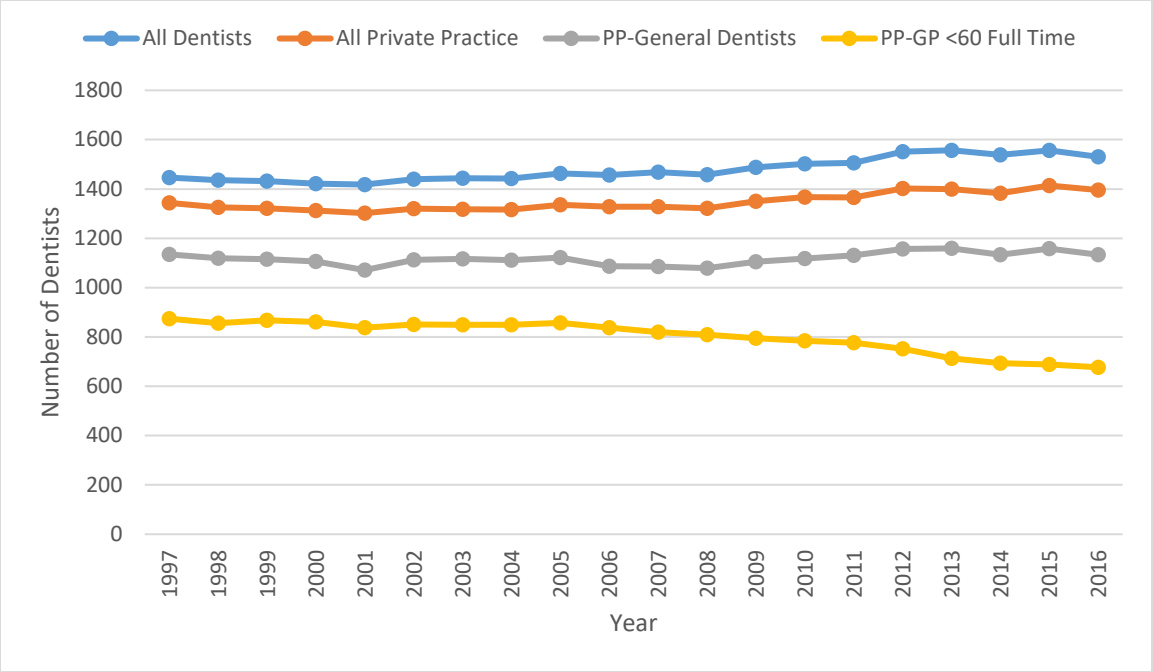


Figure 5. Active dentists, private practice dentists, general dentists in private practice, and general dentists in private practice who are less than 60 years old and work full-time[4]

Among all active dentists, the percent of dentists who were general practitioners ranged from 73.7% (2014) to 78.5% (1997).

Among private practitioners, the percent of dentists who were general dentists ranged from a low of 81.2% (2016) to a high of 84.7% (2003).

Similarly, the percent of dentists who were private practice, general practitioners who were less than 60 years of age and worked full-time ranged from a low of 44.2% (2015 and 2016) to a high of 60.5% (1999 and 2000).

Among private practitioners, between 59.8% (2016) and 78.2% (2001) were general dentists who were less than 60 years of age and worked full-time.

In 1997, 60.4% of Iowa dentists were general practitioners in private practice, younger than 60 years of age and worked full-time. By 2016, this had decreased to 44.2%.

As a reference for this figure, the numbers of dentists in 2016 were 1,530 active dentists, 1,395 private practitioners, 1,133 general dentists in private practice, and 677 general dentists in private practice under 60 years of age and working full-time.

[4] **PP-General Dentists:** private practice, general dentists in private practice in Iowa.

PP-GP <60 Full Time: private practice, general dentists under age 60, working full-time. Full-time is operationally defined as working 32 hours or more in the field of dentistry.

Table 2. Percent of dentists in each practice type, active and private practitioners, 1997 and 2016

	1997 (N=1,446)		2016 (N=1,530)	
Dentist Type	**Percent of Active Dentists**	**Percent of Private Practice (N=1,343)**	**Percent of Active Dentists**	**Percent of Private Practice (N=1,395)**
General practice*	80.4%	84.5%	79.1%	81.3%
Orthodontist	5.9%	5.9%	5.6%	5.9%
Oral & maxillofacial surgeon	3.6%	3.4%	4.6%	4.4%
Pediatric dentist	2.7%	2.2%	3.7%	3.6%
Endodontist	1.9%	1.6%	2.7%	2.6%
Prosthodontist	2.0%	1.0%	1.7%	0.9%
Periodontist	1.9%	1.4%	1.6%	1.2%
Dental public health	0.6%		0.8%	
Oral & maxillofacial pathologist	0.4%		0.3%	
Oral & maxillofacial radiologist	0.1%		0.1%	

* Includes 6 (1997) and 9 (2016) operative dentists

Nearly 80% of all active Iowa dentists at both ends of this time period were general dentists.

Orthodontists comprised the largest group of dental specialists in the state, accounting for almost 6% of all practitioners and 27% of dental specialists. The percent of general dentists in Iowa mirrors the percent of general dentists nationally (78.5%).[5]

Percentages differ slightly between the columns for active and private practice dentists because specialists in dental public health, oral & maxillofacial pathology, and oral & maxillofacial radiology do not maintain private practice offices in Iowa.

The Iowa Dentist Tracking System includes operative dentists as a separate category because there is an advanced education program in operative dentistry at the University of Iowa College of Dentistry. However, since this is not a recognized American Dental Association specialty, we have included these dentists in the general practice category.

[5] American Dental Association, Health Policy Institute. Supply of dentists in the U.S.: 2001-2018. https://www.ada.org/en/science-research/health-policy-institute/data-center/supply-and-profile-of-dentists

Table 3. Characteristics of private practice Iowa dentists, 1997 and 2016

	All Private Practice	General Practice	Specialists
1997	**N=1,343**	**N=1,135**	**N=208**
Female	10.5%	11.4%	5.8%
Solo practice	53.8%	57.2%	44.9%
Full-Time	85.7%	85.6%	83.6%
Urban	55.3%	53.3%	76.9%
Mean age (s.d.)	46.6 (11.1)	46.6 (11.1)	46.9 (9.7)
2016	**N=1,395**	**N=1,134**	**N=261**
Female	25.9%	27.1%	23.2%
Solo practice	39.6%	40.9%	25.8%
Full-Time	82.4%	81.8%	86.7%
Urban	66.0%	62.6%	80.5%
Mean age (s.d.)	48.6 (13.1)	48.7 (13.4)	48.5 (11.9)

In 1997, 15.5% of private practitioners were dental specialists. In 2016, 18.8% of private practitioners were dental specialists, and 21.4% of all Iowa active dentists were dental specialists.

Female dentists increased from 10.5% of private practitioners (1997) to 25.9% (2016).

Among all private practitioners, the percentage of private practitioners who were in solo practice declined from 53.8% to 39.6%. The percentage of private practitioners working 32 or more hours per week (defined as full-time) slightly declined from 85.7% to 82.4%.

The percentage of private practitioners who practiced in an urban county increased from 55.3% to 66.0%.

The mean age of private practice dentists increased 2 years from 46.6 to 48.6 years.

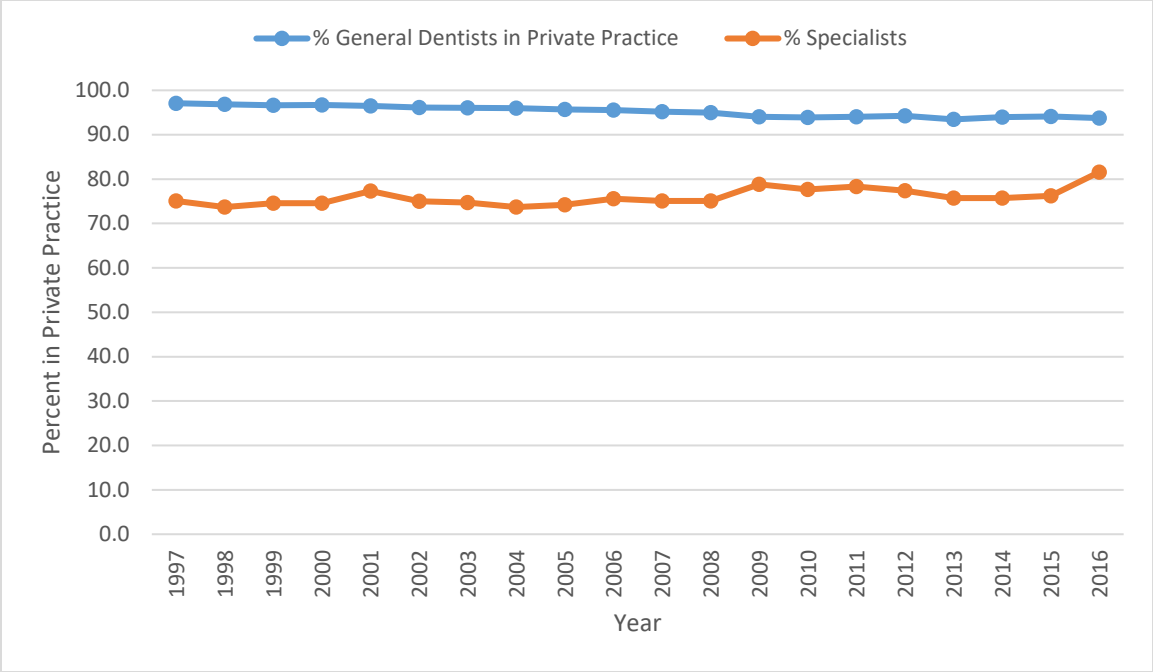


Figure 6. Percent of active Iowa dentists who are in private practice, general dentists and specialists, 1997-2016

Since 1997, there has been a gradual decline in the percent of general dentists who were in private practice from a high of 97.1% in 1997 to a low of 93.5% in 2013.

Dental specialists in private practice ranged 73.7% (1998 and 2004) to 81.6% (2016) of all specialists.

Part of the discrepancy between general dentists and dental specialists was that a disproportionate number of specialists were employed at the University of Iowa College of Dentistry and the University of Iowa Hospital and Clinics.

Figures 7-9 indicate geographical distributions of private practice dentists over time. The size of the violet circle indicates the relative cadre of dentists for that community. Each county is categorized into one of 4 groups based on the size of the population. The darker the shade of the county, the more heavily populated the county at that time period.

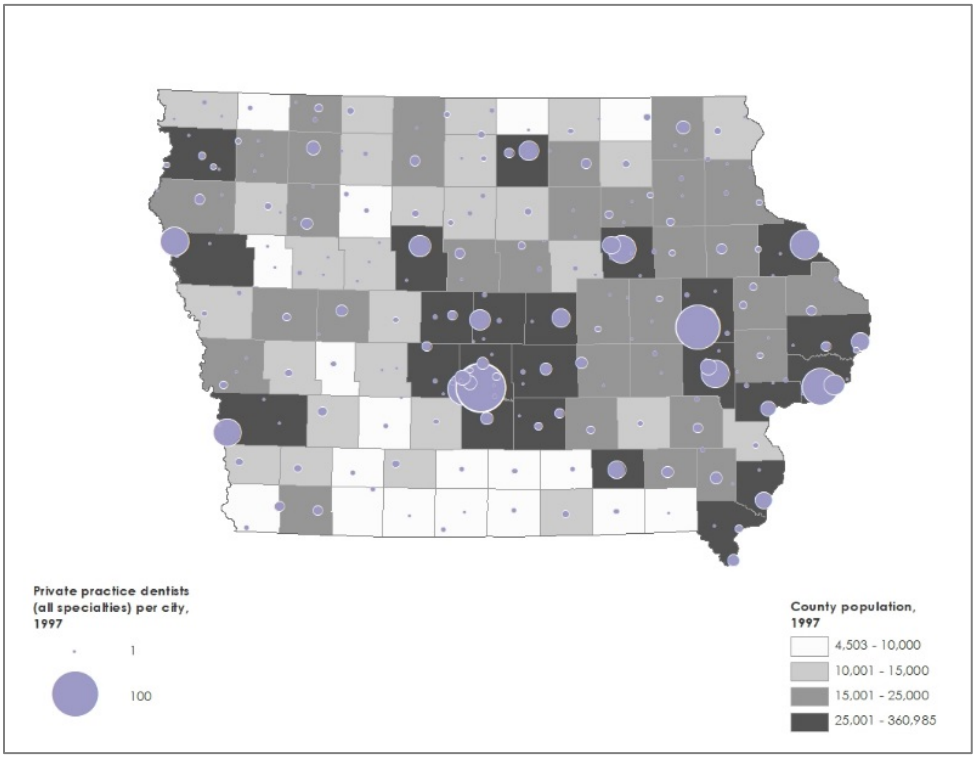


Figure 7. Location of Iowa private practice dentists, 1997

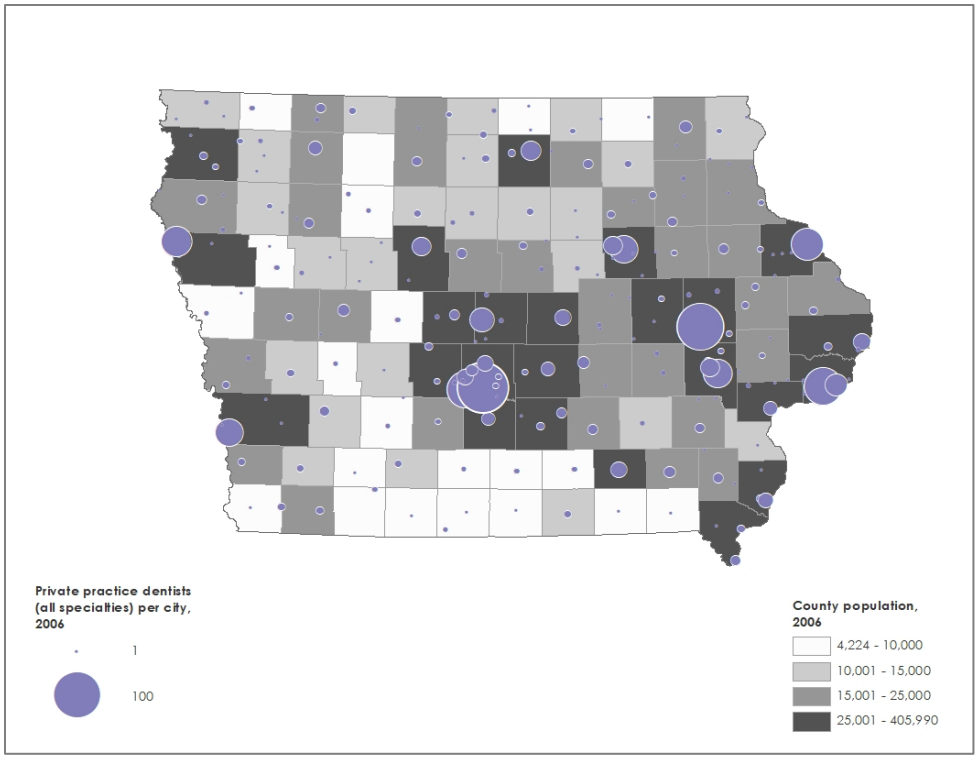


Figure 8. Location of Iowa private practice dentists, 2006

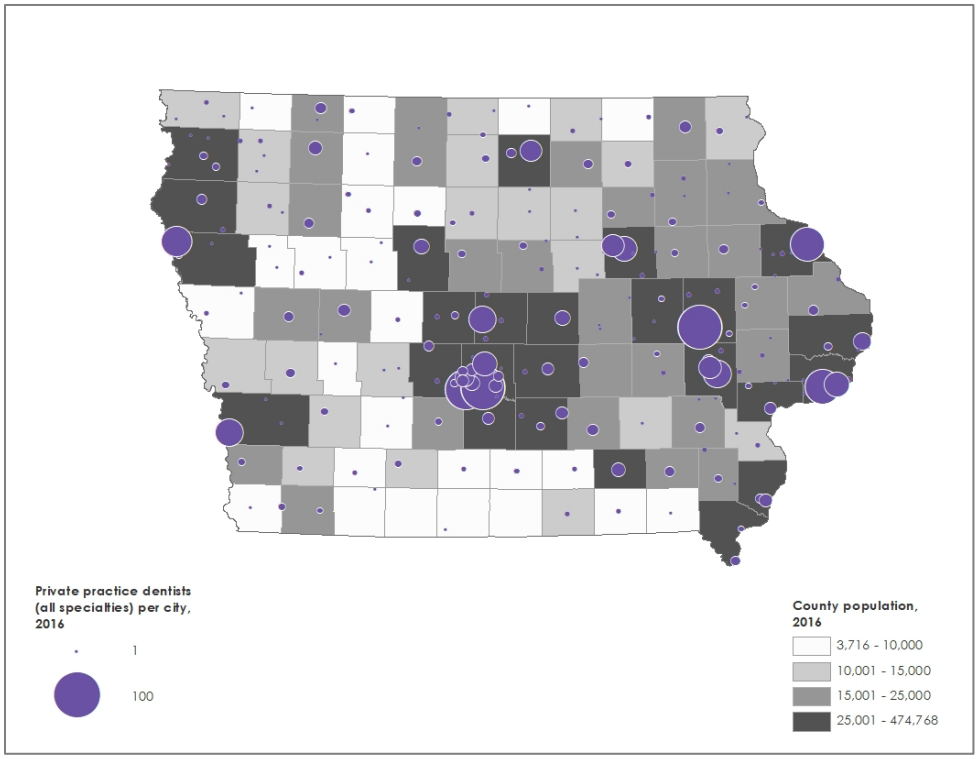


Figure 9. Location of Iowa private practice dentists, 2016

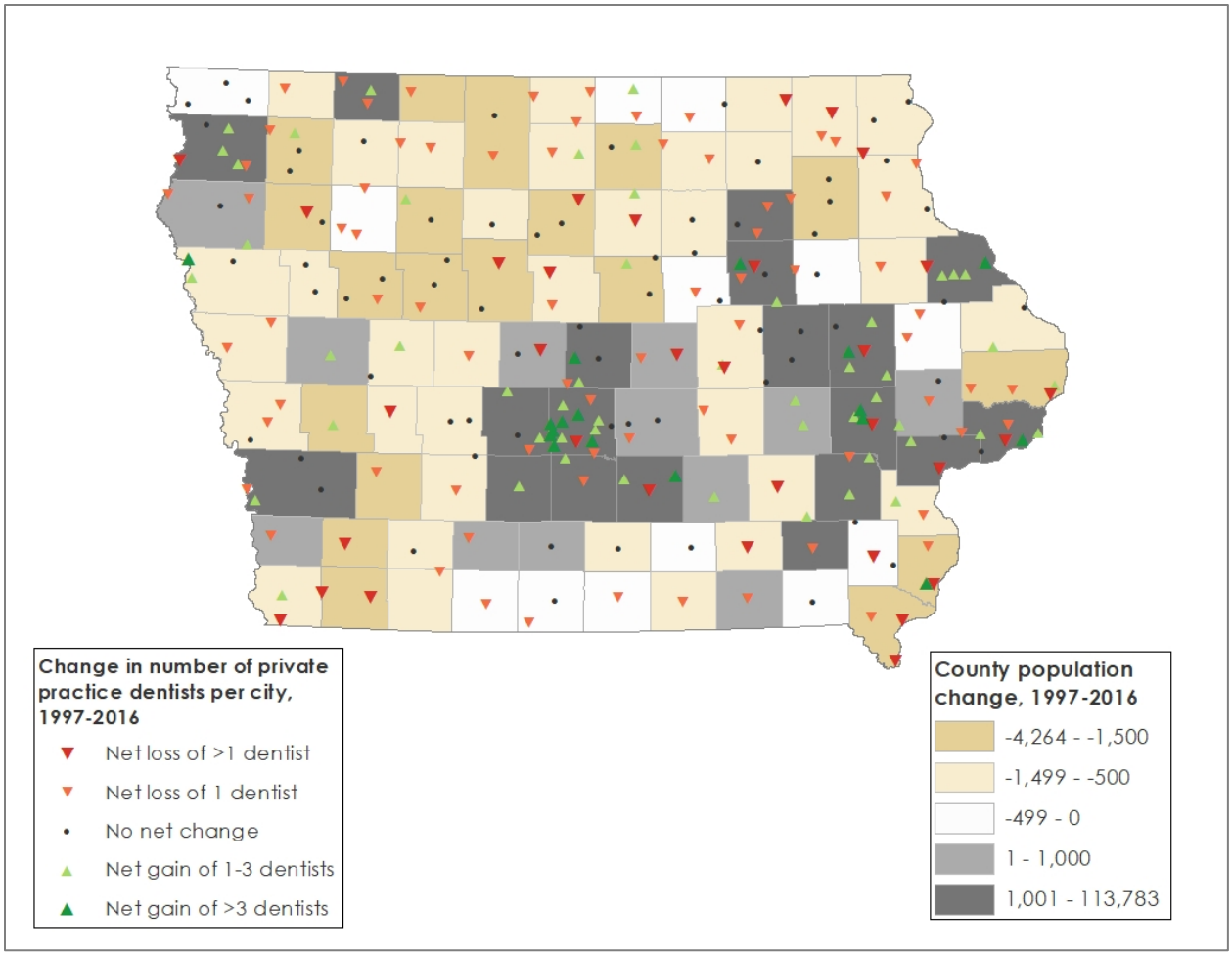


Figure 10. Change in number of dentists, by city, between 1997 and 2016

This map indicates change in the number of dentists within a community and, if so, whether the direction was positive (green arrow pointed up) or negative (red arrow pointed down). The background shade for each county represents the relative population change during this 20-year period. Tables 4 and 5 list communities with the largest net gains/losses for private practice dentists from 1997 through 2016.

Approximately 30% of Iowa cities with any private practice dentists did not have any net change from 1997 through 2016. Cities without any dentists are not represented in this calculation.

Table 4. Cities with the greatest net gain of private practice dentists, 1997-2016

City	Net gain
West Des Moines	27
Ankeny	21
Dubuque	15
Ames	15
Sioux City	11
Coralville	11
Bettendorf	10
Cedar Falls	10
Pleasant Hill	10
North Liberty	8

Several communities experienced a substantial net gain during this 20-year period, in part either due to natural community population growth or practitioners no longer desiring office locations in a larger community's downtown sections.

Overall, 27.5% of Iowa cities showed a net gain in the number of private practice dentists.

Table 5. Cities with the greatest net loss of private practice dentists, 1997-2016

City	Net loss
Des Moines	16
Fort Dodge	9
Iowa City	8
Burlington	6
Muscatine	5
Hampton	3
Keokuk	3
Marion	3
Mount Pleasant	3
Clarinda	3
Ottumwa	3
Shenandoah	3

In many cities throughout the United States, there has been a shift during the past few decades for the location of dental practices, from downtown urban sites to many suburban communities. The most striking example within Iowa is Des Moines, which is the state's largest city. There had been a loss of 16 private practice dentists, which was offset by substantial net gains for some of Des Moines' surrounding communities (i.e., West Des Moines [west], Ankeny [north], and Pleasant Hill [east]. Likewise, although Iowa City had lost 8 private practice dentists, this number was counterbalanced with gains by Coralville and North Liberty, which are west and north of Iowa City, respectively.

Overall, 43% of Iowa communities showed a net loss in the number of private practice dentists.

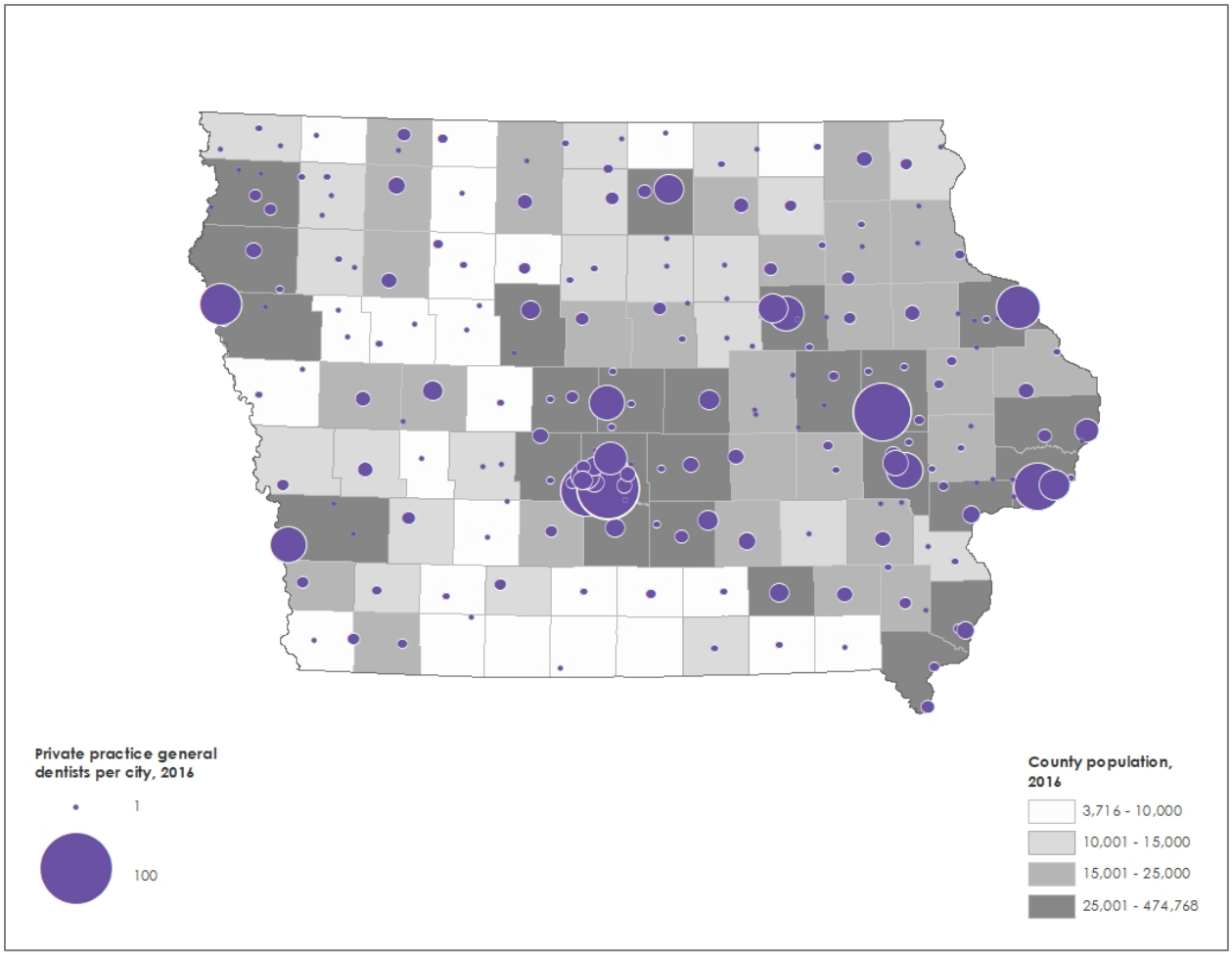


Figure 11. Location of Iowa private practice general dentists, 2016

Since almost 80% of private practice dentists are generalists, it is not surprising that this figure is quite similar to Figure 9 (all private practice dentists), especially in more rural areas of the state.

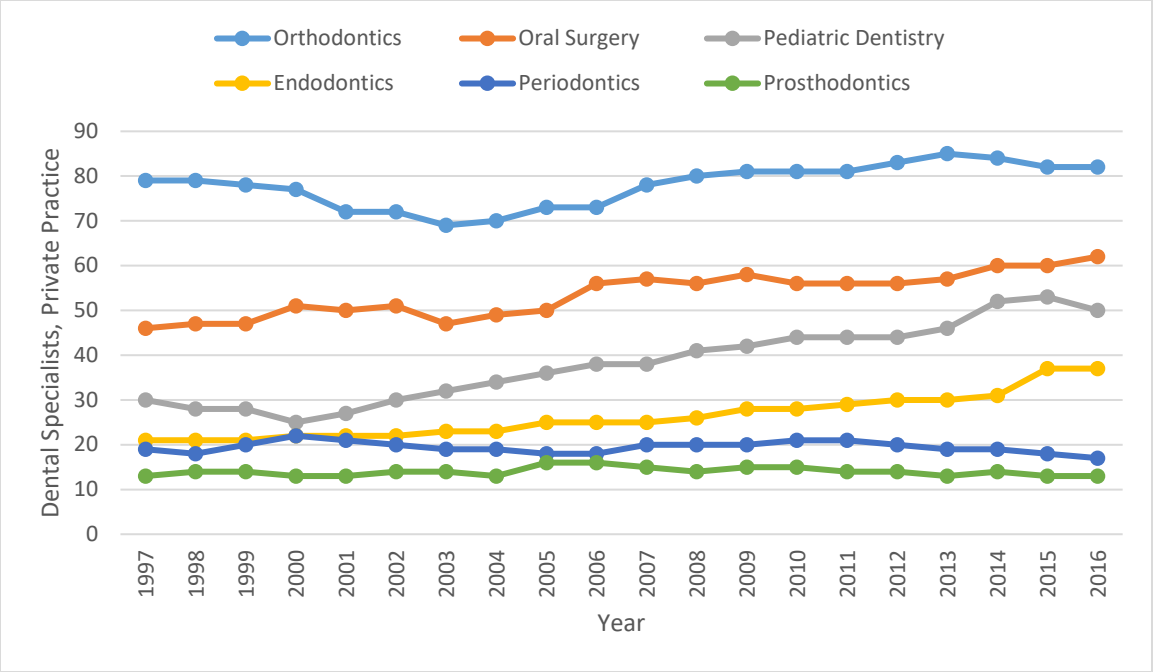


Figure 12. Number of Iowa dental specialists in private practice, 1997-2016

In 2016, there were 261 Iowa dental specialists in private practice, a 25.4% increase since 1997.

Orthodontics started and ended with nearly identical numbers, but their numbers dipped in early to mid-2000s.

The number of oral and maxillofacial surgeons had a slow, steady increase during the 20 years from 46 to 62.

The most rapid rise in number of any of the clinical specialties during this time period was for pediatric dentistry, which doubled in size from 2000 to 2016.

Likewise, there was almost a doubling in the number of endodontists, from 21 to 37.

The number of periodontists and prosthodontists remained stable number throughout, with a slightly greater number of periodontists during this time frame.

Figures 13 through 18 display the location for 6 clinical dental specialists (endodontists, oral surgeons, orthodontists, pediatric dentists, periodontists, and prosthodontists) in private practice during 3 time periods (1997, 2006, and 2016).

The legend on the left of each map indicates the number of private practice specialists by city.

The legend on the right provides, in quintiles, the number of general dentists per county population. Note that the last 2 categories for 2016 differ from 1997 and 2006.

For 2016, the city of West Des Moines had the most private practice endodontists, oral surgeons, pediatric dentists, and prosthodontists. Cedar Rapids had the most private practice orthodontists and periodontists.

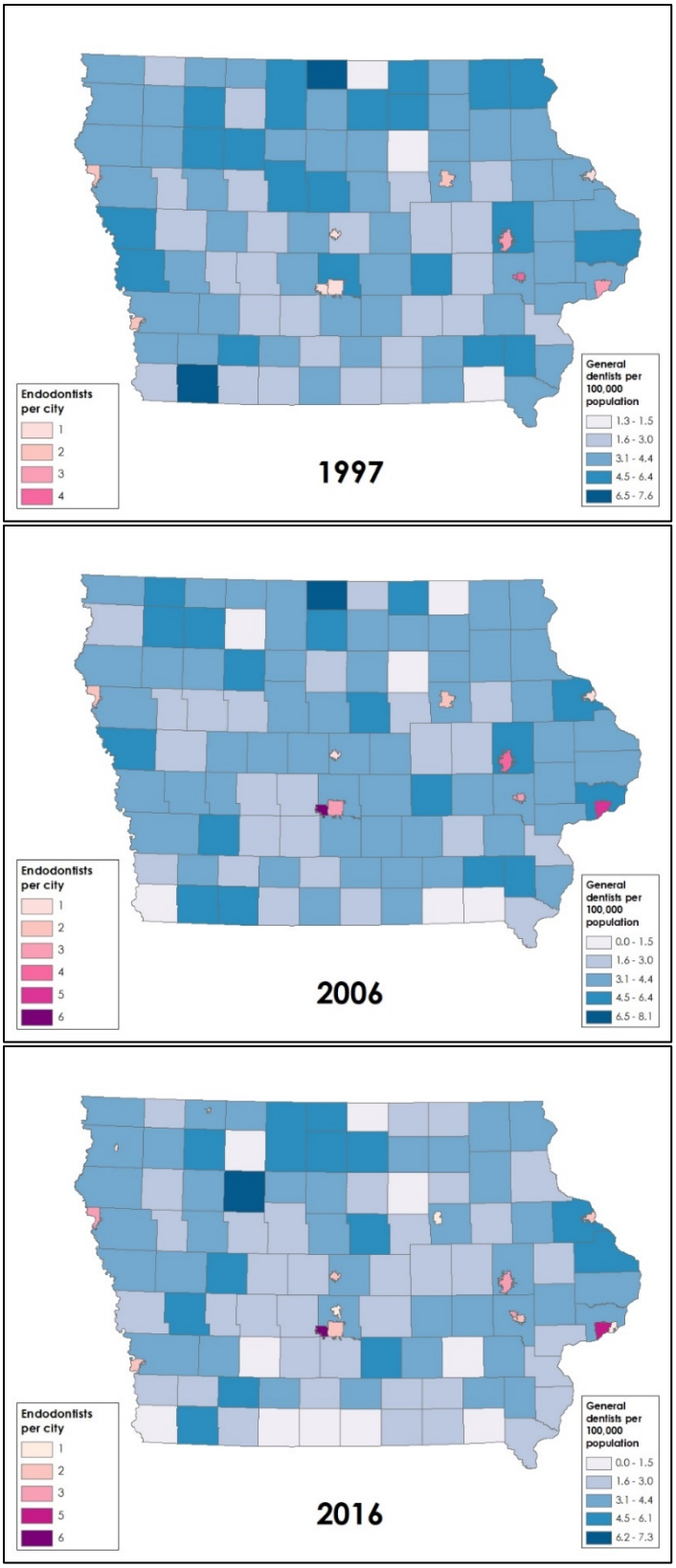


Figure 13. Location of private practice endodontists per city, 1997, 2006, and 2016

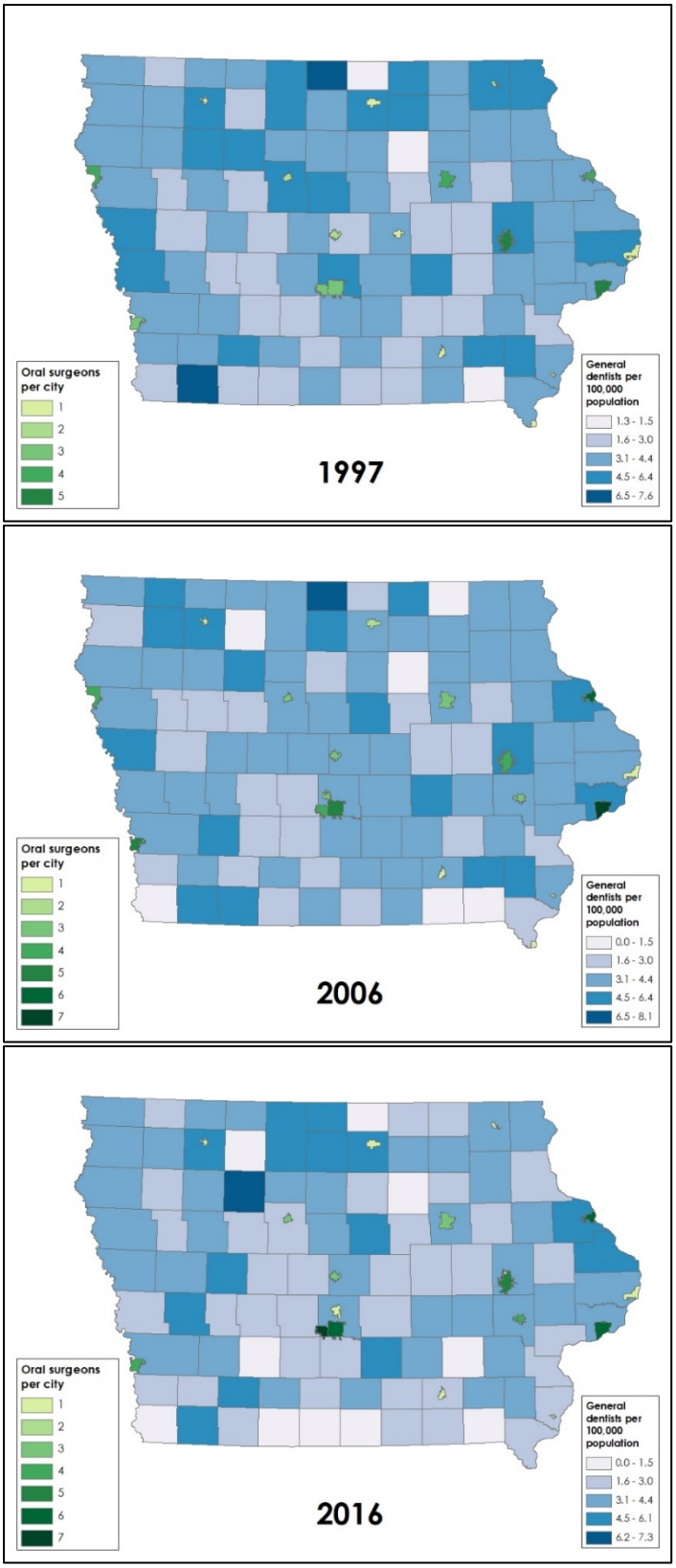


Figure 14. Location of private practice oral surgeons per city, 1997, 2006, and 2016

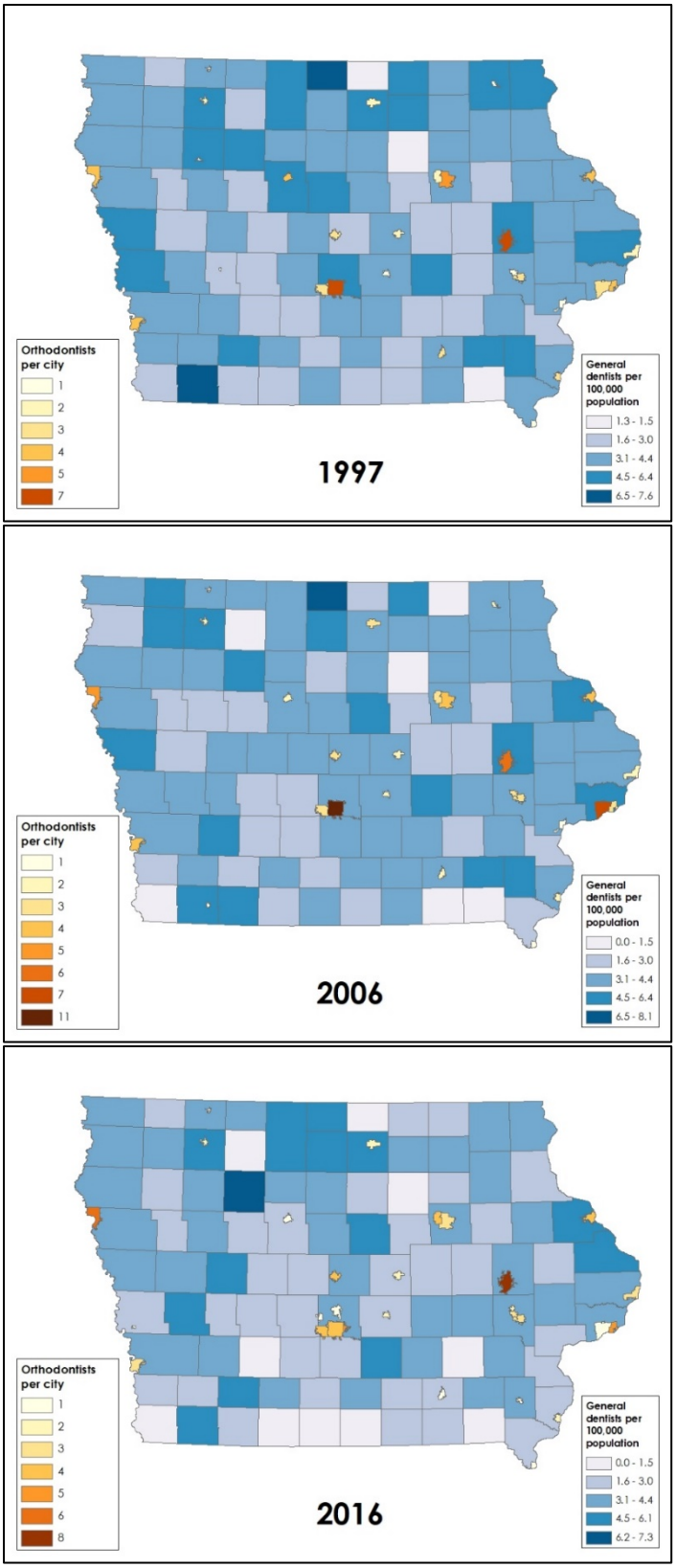


Figure 15. Location of private practice orthodontists per city, 1997, 2006, and 2016

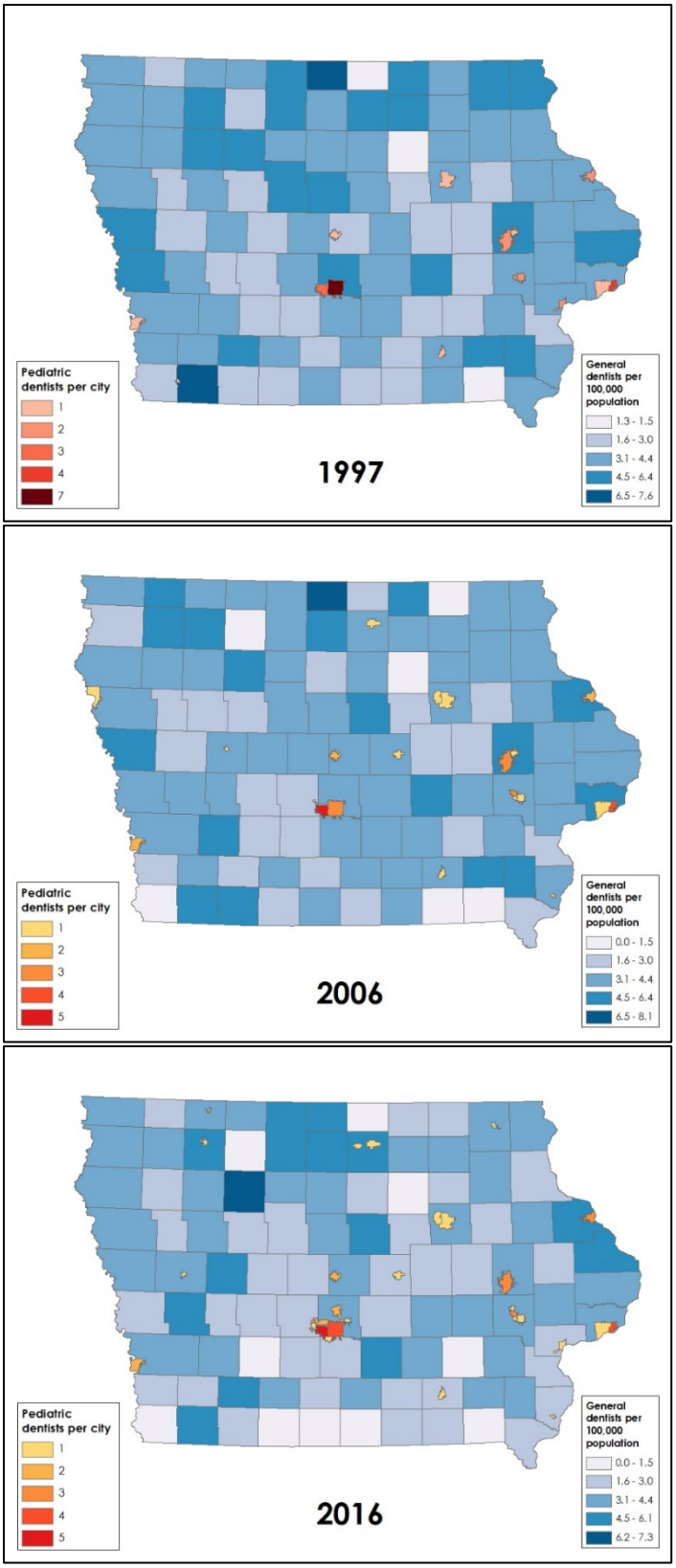


Figure 16. Location of private practice pediatric dentists per city, 1997, 2006, and 2016

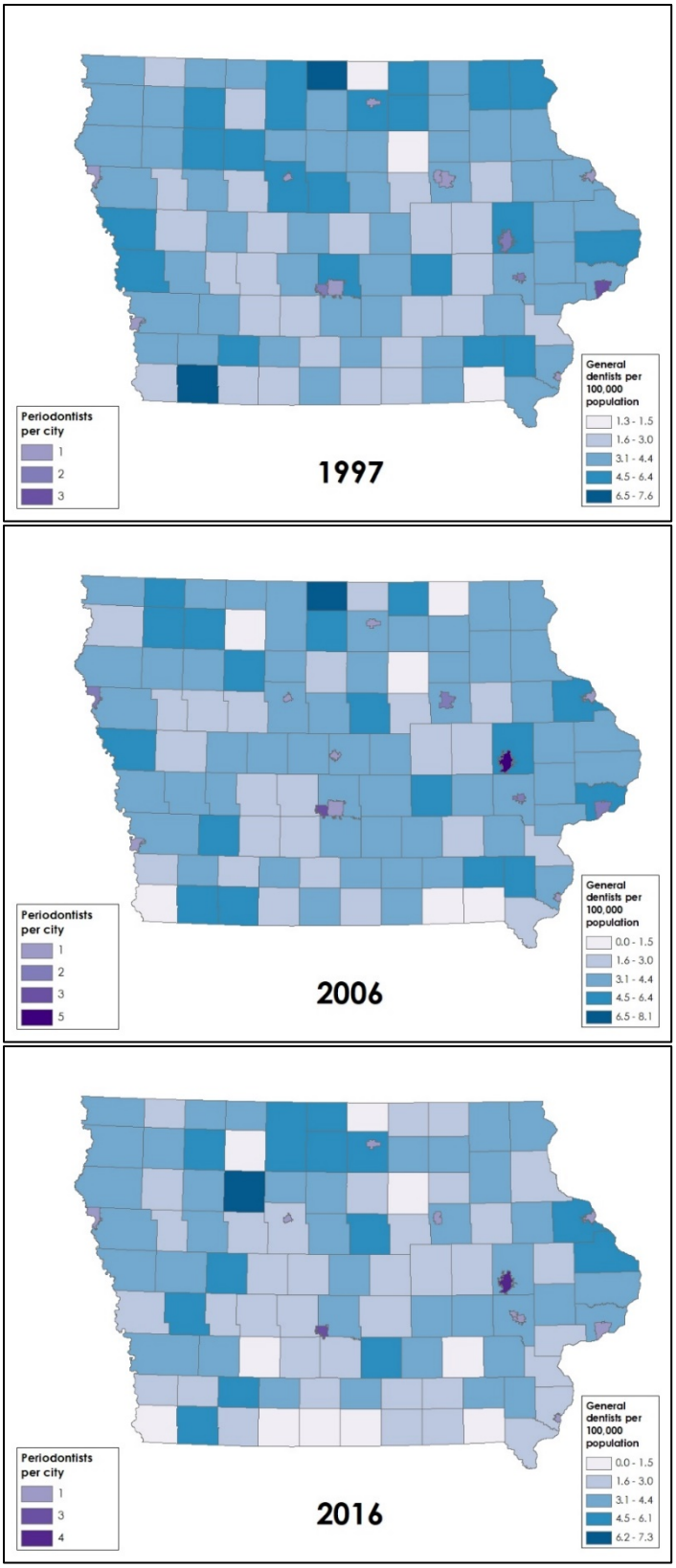


Figure 17. Location of private practice periodontists per city, 1997, 2006, and 2016

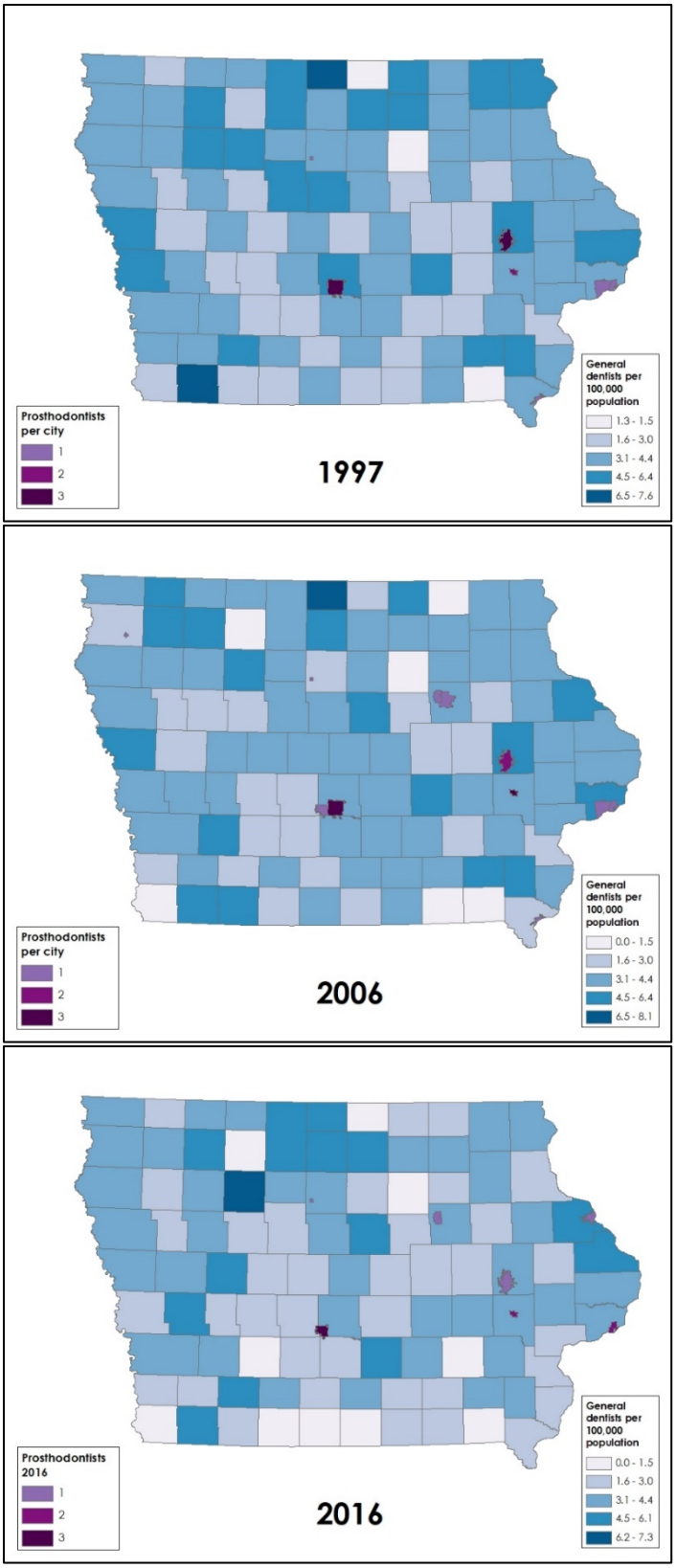


Figure 18. Location of private practice prosthodontists per city, 1997, 2006, and 2016

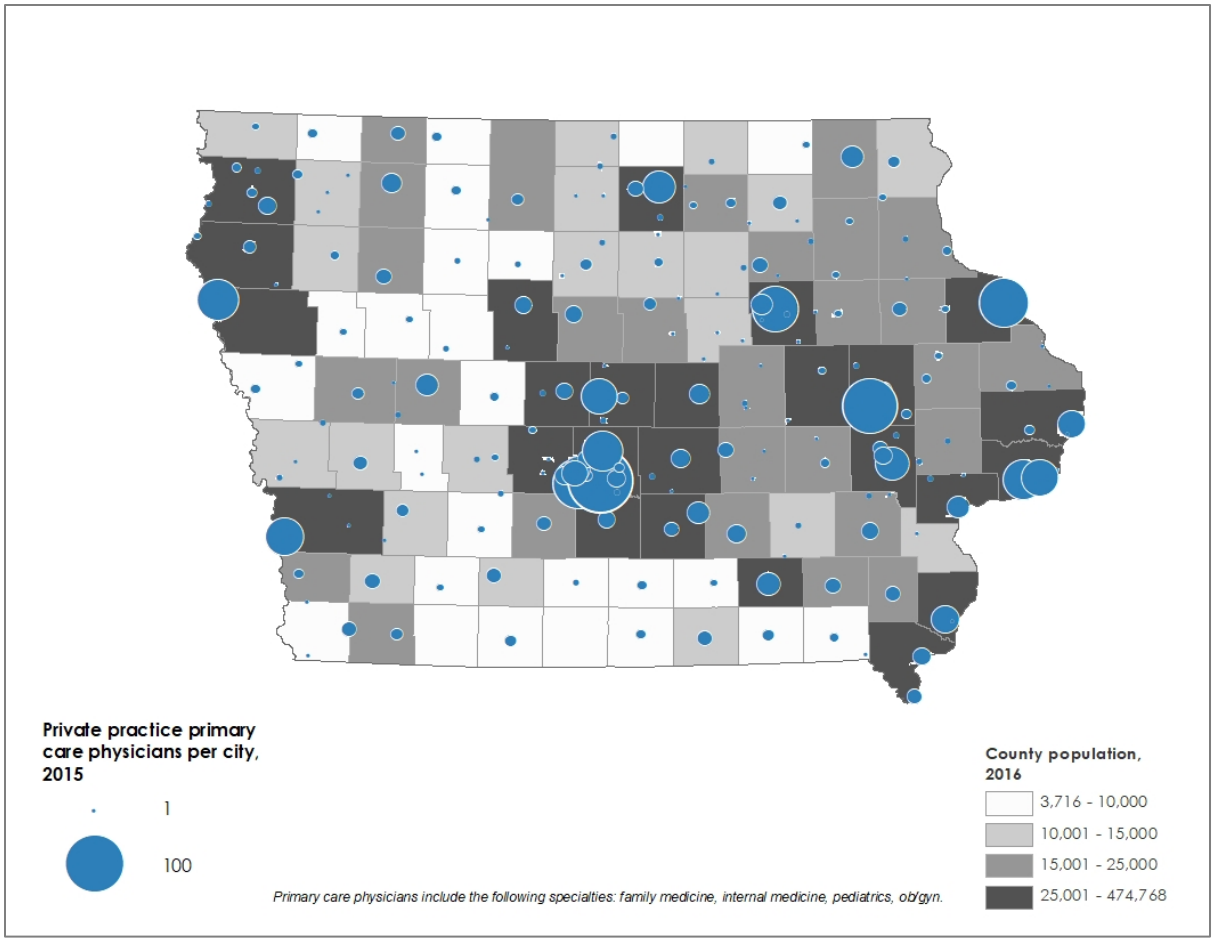


Figure 19. Location of Iowa primary care physicians, 2015

The size of the blue circle indicates the relative cadre of primary care physicians (i.e., family medicine, internal medicine, pediatrics, and obstetrics/gynecology) for that community. Each county is categorized into 1 of 4 groups based on the size of the population. The darker the shade of the county, the more heavily populated the county at that time period.

Refer to Figure 9 to observe similarities and differences between the location of primary care physicians and private practice dentists for approximately the same time period.

N.B.: The authors purchased the physician data files for years ending in 0 and 5. Thus, this figure is out of sync with the 2016 data, but annual changes are very small for any of the tracking systems.

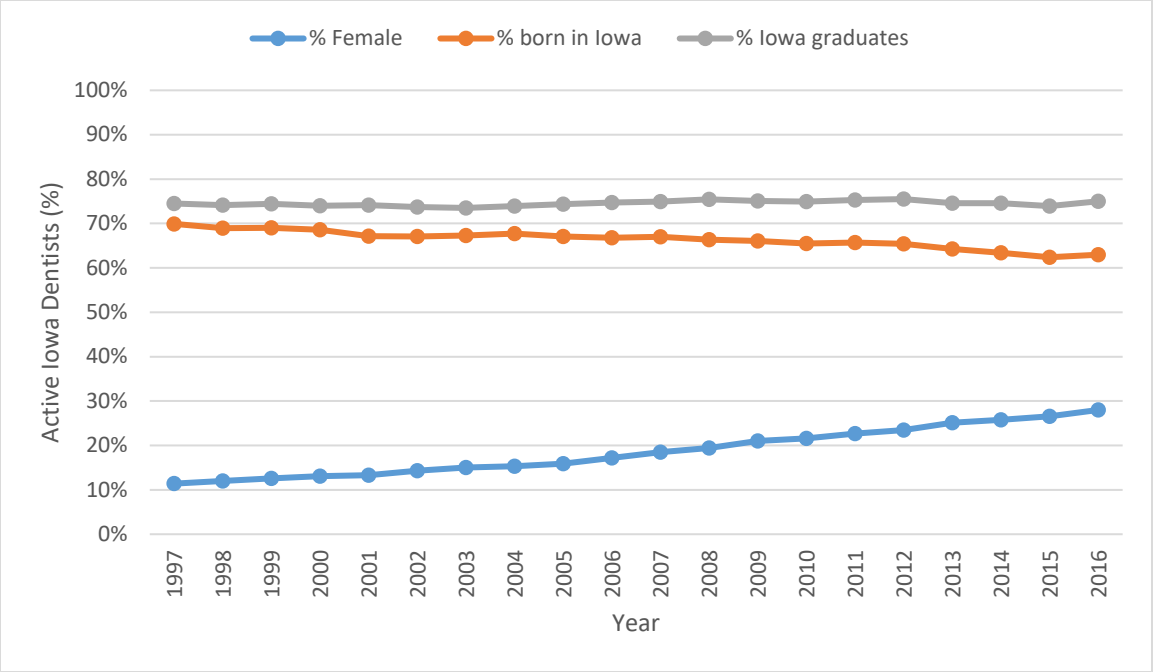


Figure 20. Percent of active Iowa dentists, by sex, birth state, and dental school attended, 1997-2016

The percent of female active dentists increased from 11% in 1997 to 28% in 2016.

There was almost no variation (74-75%) in the percent of University of Iowa graduates during this time.

There was a gradual decrease in the percent of active Iowa dentists who were born in the state. In 1997, 70% were Iowa native; this percent decreased to 62-63% by 2015-2016.