

Characteristics of General Dentists Practicing in Indiana

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ABSTRACT

Background: Every two years dentists in Indiana renew their licenses. In 2012, if they chose to renew their license electronically, the dentists were provided the opportunity to answer a voluntary online survey during the renewal process. The 2012 survey allowed dentists to list their dental specialty, with general dentistry being one option, and then answer several questions about themselves and their practices. **Purpose:** The main purpose of this study was to summarize the demographic characteristics of general dentists practicing in Indiana as of March 2012. **Methods:** The Indiana Professional Licensing Agency (PLA) provided the Indiana State Department of Health with a copy of the *2011-2012 Indiana Dentist Re-licensure Survey* responses, as well as a list of the dentists with Indiana dental licenses. These two files were combined into a merged dataset and then criteria were applied to select *general dentists practicing in Indiana that took the survey*. By using the responses of these dentists to the survey, we determined their demographic characteristics, and present these as reasonable estimates of the demographic characteristics of general dentists practicing in Indiana. **Results:** The PLA reported that n=3,760 dentists renewed their dental license as of March 2012. According to our criteria, n=2,724 of these dentists took the survey (72%), and n=1,823 *general dentists practicing in Indiana took the survey*. The demographic characteristics of the general dentists practicing in Indiana that took the survey, with respect to age, race, ethnicity and gender, were: median age of 49.0 years; 89.9% White, 2.6% Black and 7.5% Other; 2.0% Hispanic and 98.0% Non-Hispanic; and 74.5% male and 25.5% female. The percentages for Black, Hispanic and female general dentists were less than the corresponding percentages for Black, Hispanic and female people in the general population. The age distribution of the general dentists practicing in Indiana that took the survey indicated that a potentially large number of general dentists are approaching retirement age. **Conclusions:** The *2011-2012 Indiana Dentist Re-licensure Survey* provided good baseline information about the demographic characteristics of general dentists practicing in Indiana. If similar surveys are conducted in the future, they should provide valuable information about the dental workforce in Indiana and how it is changing over time.

INTRODUCTION

The Indiana Professional Licensing Agency (PLA) conducted a survey of dentists during their 2012 licensure renewal process. The PLA offered dentists, who were renewing their dental licenses electronically, a voluntary online survey to complete. This survey was designed to collect information on the characteristics of the dentists and their practices, and their willingness to provide services in case of a public health emergency in Indiana. The 2012 survey allowed dentists to list their dental specialty, with general dentistry being one option. The PLA provided the responses of the dentists to this survey to the Indiana State Department of Health (ISDH) for analysis. In order to facilitate this analysis, the PLA also provided a list of the dentists with Indiana dental licenses.

The main purpose of this study was to estimate the demographic characteristics of general dentists practicing in Indiana as of March 2012. A secondary purpose was to provide information about the prevalence of general dentists practicing in Indiana.

METHODS

The PLA reported that n=3,760 dentists renewed their dental license during the 2012 renewal process. Of these dentists, those that renewed their license electronically were offered the option of taking the online *2011-2012 Indiana Dentist Re-licensure Survey*. For the purposes of this study we considered a dentist to have taken the survey if that dentist answered, at a minimum, questions 1, 2 and 7 on the survey. According to these criteria n=2,724 dentists took the survey. Thus, among all the dentists that renewed their Indiana dental license, 72% took the survey. We combined the file containing the survey responses with information on file with the PLA pertaining to Indiana dental licenses, and then applied certain criteria to this merged dataset. First, we excluded those dentists who responded, 'dentist renewing license but retired' and 'dentist renewing license but temporarily not practicing' on question one. Then, we excluded those dentists who did not respond with 'general dental practice' on question two, and those that did not respond 'direct patient care or patient-care-related activities' on question seven. Next, we examined the city, state and zip code of the primary practice locations listed in the survey. Dentists who listed a state other than Indiana for their primary practice location were excluded. Dentists missing all or some of the information about their primary practice location were examined further. Those dentists missing all primary practice location information were examined only if their state listed with the PLA was Indiana. Missing primary practice locations were obtained by using a variety of Internet search engines. These locations were added to the merged dataset. Any dentist whose primary practice location was determined to be outside Indiana was excluded. Applying all these criteria produced a final merged dataset containing the survey responses of n=1,823 general dentists practicing in Indiana as of March 2012. We added several variables to assist with the analysis of these general dentists, including their age as of March 1, 2012, and the region in Indiana of their primary practice location. The four regions used in this study were derived from the 10 Public Health Preparedness Districts in Indiana, as indicated in Appendix A. Finally, we determined the demographic characteristics of the

Indiana population and the four regional populations, using the 2010 U.S. Census data, in order to compare these population characteristics to the demographic characteristics of the general dentists.

RESULTS

The PLA reported data for two categories of dentists, ALL dentists and INDIANA RESIDENT dentists. The PLA reported that among ALL dentists, n=3,760 renewed their dental license by March 2012, and of these, n=3,376 renewed their licenses electronically. Thus, for ALL dentists, 90% renewed their license electronically. The PLA reported that among INDIANA RESIDENT dentists, n=3,255 renewed their dental license, and of these n=2,895 renewed their license electronically. Thus, for INDIANA RESIDENT dentists, 89% renewed their license electronically.

According to our criteria, among PLA's ALL dentists that renewed their license, n=2,724 *took the survey* (72%), and among *general dentists practicing in Indiana* that renewed their license, n=1,823 *took the survey*. See Table 1.

The response rate, from the perspective of ALL dentists who renewed their licenses electronically and were actually capable of taking the survey, was about 81% $\{(2,724 / 3,376) * 100\}$.

Table 1 Indiana dental license renewals and survey participation (March 2012)

	Criteria	ALL dentists (PLA)	INDIANA RESIDENT dentists (PLA)	<i>General dentists practicing in Indiana</i> (ISDH)
Renewed License	PLA	3,760 (100%)	3,255 (100%)	-
Renewed Electronically	PLA	3,376 (90%)	2,895 (89%)	-
<i>Took the Survey</i>	ISDH	2,724 (72%)	-	1,823

The statewide characteristics of the general dentists that took the survey, with respect to age, race, ethnicity, and gender, were: median age of 49.0 years; 89.9% White, 2.6% Black and 7.5% Other; 2.0% Hispanic and 98.0% Non-Hispanic; and 74.5% male and 25.5% female. These statewide characteristics, along with the regional characteristics of the general dentists that took the survey, are included in Table 2. The values in Table 2 are presented as reasonable estimates of the demographic characteristics of general dentists practicing in Indiana, whether they took the survey or not.

Table 2 Characteristics of *general dentists practicing in Indiana* that took the survey (March 2012)

	Dentists	Age (Yrs)		Race (%)			Ethnicity (%)		Gender (%)	
		Mean	Median	White	Black	Other	Hisp.	Non-H.	Male	Female
Indiana	1823	48.3	49.0	89.9	2.6	7.5	2.0	98.0	74.5	25.5
Central	585	46.9	47.0	86.5	3.3	10.1	2.4	97.6	69.1	30.9
East/West	319	50.2	52.0	93.5	2.0	4.6	1.3	98.7	76.1	23.9
North	566	48.6	50.0	87.8	3.5	8.7	2.5	97.5	77.9	22.1
South	353	48.3	50.0	95.6	0.6	3.8	0.9	99.1	76.3	23.7

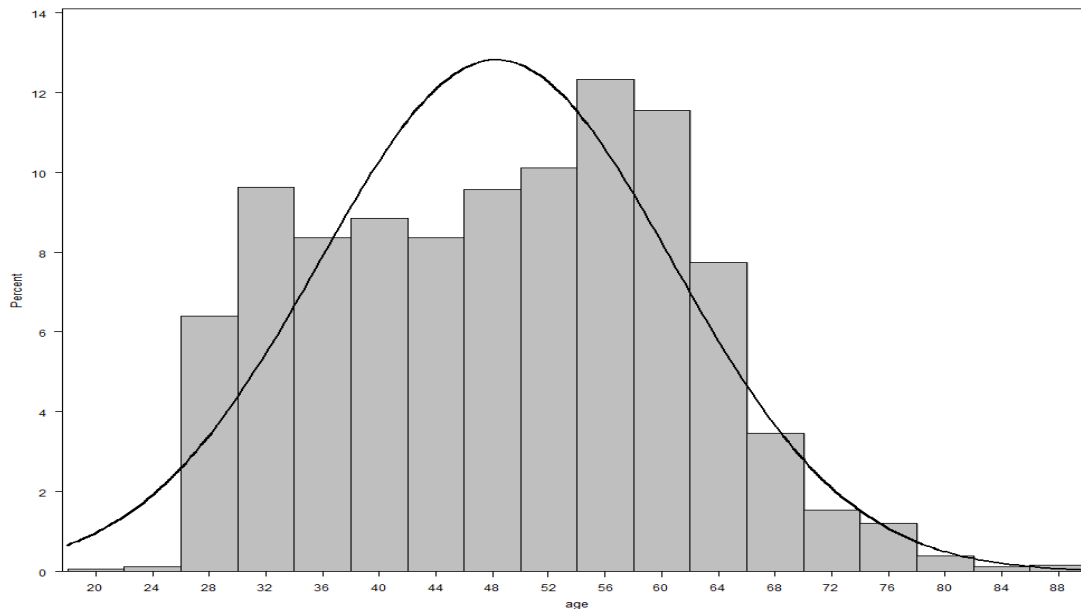
The demographic characteristics of the population of Indiana, according to the 2010 U.S. Census, with respect to age, race, ethnicity, gender and socioeconomic status, were: median age of 39.4 years; 86.9% White, 9.3% Black and 3.8% Other; 6.0% Hispanic and 94.0% Non-Hispanic; 49.2% male and 50.8% female; and \$45,616 median family income. These statewide characteristics, along with the regional characteristics of the population, are included in Table 3.

Table 3 Characteristics of the population in Indiana (2010 U.S. Census)

	Population	Age (Yrs)		Race (%)			Ethnicity (%)		Gender (%)		SES (\$) Median
		Mean	Median	White	Black	Other	Hisp.	Non-H.	Male	Female	
Indiana	6,479,893	-	39.4	86.9	9.3	3.8	6.0	94.0	49.2	50.8	\$45,616
Central	1,707,670	-	37.9	79.5	15.7	4.8	6.4	93.6	48.7	51.3	\$58,414
East/West	1,290,764	-	39.9	92.4	4.3	3.4	3.7	96.3	49.7	50.3	\$42,390
North	2,185,291	-	38.8	85.4	11.1	3.6	9.2	90.8	49.2	50.8	\$45,584
South	1,296,168	-	39.9	93.7	3.2	3.1	2.7	97.3	49.4	50.6	\$45,454

We further analyzed the general dentists practicing in Indiana that took the survey, according to their age distribution. Figure 1 demonstrates that there is a relatively large cohort of dentists between the ages of 54 and 62.

Figure 1 Age distribution of general dentists practicing in Indiana that took the survey (March 2012)



DISCUSSION

Demographic Characteristics

Public health officials and dental educators need basic demographic information about the characteristics of general dentists practicing in Indiana in order to rationally plan for the dental workforce needs of Indiana.

During the 2012 license renewal process for dentists, the Indiana Professional Licensing Agency (PLA) provided dentists an opportunity to complete a voluntary online survey, the *2011-2012 Indiana Dentist Re-licensure Survey*, when they renewed their license electronically. This survey allowed dentists to identify their dental specialty, with general dentistry being one option.

The PLA keeps records of Indiana dental licenses for ALL dentists, including the sub-category of INDIANA RESIDENT dentists. However, the PLA does not keep records of primary practice locations or whether a dentist is a general dentist or a dental specialist. Thus, for this study, the Oral Health Program at the ISDH established criteria for determining if a dentist took the survey and criteria for when a dentist would be considered a general dentist practicing in Indiana.

The number of dentists who renewed their dental license for 2012, and that renewed their license electronically, for ALL dentists and INDIANA RESIDENT dentists was provided by the PLA, and is listed in Table 1. The percentage of ALL dentists and the percentage of INDIANA RESIDENT dentists who renewed their licenses electronically were very similar. The number of general dentists practicing in Indiana that renewed their dental license, and that renewed their license electronically, was not available. Thus, we could not determine the percentage of general dentists practicing in Indiana that renewed their dental license electronically.

The number and percentage of PLA's ALL dentists that took the survey, according to our criteria, is also listed in Table 1. We suspect that the percentage of general dentists practicing in Indiana that took the survey, according to our criteria, was similar to the percentage of ALL dentists who took the survey; that is, 72%.

The demographic characteristics of general dentists practicing in Indiana that took the survey are included in Table 2. When examining this data, it is important to realize that the dentists who participated in this survey were self-selected; that is, they were not a random sample of dentists in Indiana, nor were they constituents of a random sample of people from the general population. Thus, this data could be biased according to which dentists chose to participate. However, a large portion of general dentists practicing in Indiana participated, which should mitigate most concerns about bias, and thus the values in Table 2 are presumed to be reasonable estimates of the demographic characteristics of general dentists practicing in Indiana, whether they took the survey or not.

The survey indicated that for general dentists practicing in Indiana, their median age was 49.0 years, with the vast majority being White, Non-Hispanic and male. These characteristics appeared to vary by region, with general dentists being slightly younger in the Central Region than in other regions, with relatively more general dentists who were Black or Other, or Hispanic, being located in the Central and Northern Regions. There were more female dentists located in the Central Region than in other regions of the state.

The demographic characteristics of the general population, based on the 2010 U.S. Census, were included to allow comparison to the demographic characteristics of the general dentists practicing in Indiana. The Census data is presented in Table 3.

The percentage of general dentists that were Black was less than the percentage of Blacks in the general population, while the percentage of general dentists categorized as Other was greater than the percentage of Other in the general population. The percentage of general dentists that were Hispanic was less than the percentage of Hispanics in the general population. The percentage of female general dentists in the Central Region was more than in the other three regions, but was still less than the percentage of females in the general population.

The data indicated that Black and Hispanic dentists tend to locate in regions of the state with larger Black and Hispanic populations.

The age distribution of the general dentists practicing in Indiana that took the survey indicated that a potentially large number of general dentists practicing in Indiana are likely approaching retirement age. This could influence the workforce of general dentists practicing in Indiana in the near future.

Prevalence

In addition to having information about the demographic characteristics of general dentists practicing in Indiana, public health officials and dental educators are interested in the prevalence of general dentists practicing in Indiana. Prevalence of dentists in the population can be presented as a *percentage*, but the dental profession is more accustomed to prevalence being presented as *dentists per 10,000* people in the population or as a *dentist-to-population ratio*. The prevalence of general dentists in the general population can be estimated by selecting a random sample of all people from the general population, and then calculating the prevalence of general dentists in that sample. This type of data was not available for this study.

However, we did know that among ALL dentists, as defined by the PLA, 72% took the survey. Thus, we assumed that 72% of the general dentists practicing in Indiana also took the survey. Using this assumed percentage, and the number of general dentists practicing in Indiana that took the survey, we extrapolated the number of general dentists practicing in Indiana; that is, *both those that took the survey and those that did not*. This allowed us to estimate the prevalence of general dentists practicing in Indiana. See Appendix B and Table 4. *The response rate among ALL dentists that renewed their licenses electronically, and were capable of taking the survey, was about 81%, but*

using this value would not have allowed us to extrapolate the number of all general dentists practicing in Indiana.

The statewide and regional prevalence of general dentists practicing in Indiana as of March 2012, presented in terms of *dentists per 10,000* people in the population were likely about 3.89 statewide, and 4.73, 3.42, 3.58 and 3.76 in the Central, Eastern/Western, Northern and Southern Regions, respectively. The corresponding values in terms of the *dentist-to-population ratio* were likely about 1:2,572 statewide, and 1:2,113, 1:2,927, 1:2,794 and 1:2,656, regionally. These values pertaining to the prevalence of general dentists practicing in Indiana are based on extrapolated data, and may substantially overestimate or underestimate the actual values. Based on these prevalence data, it appears that general dentists were unevenly distributed in the four regions of Indiana, to a moderate degree, as of March 2012.

SUMMARY

The estimated demographic characteristics of general dentists practicing in Indiana, as of March 2012, *based on the general dentists that took the survey*, included:

- Median age of general dentists was 49.0 years;
- Percentage of general dentists that were Black was less than the percentage of Blacks in the general population;
- Percentage of general dentists that were Hispanic was less than the percentage of Hispanics in the general population;
- Percentage of general dentists that were female was less than the percentage of females in the general population; and
- Age distribution of general dentists indicated a significant number are approaching retirement age.

The estimated geographic distribution of general dentists practicing in Indiana, as of March 2012, *based on the general dentists that took the survey*, included:

- General dentists appeared to be unevenly distributed by region.

Appendix A – Four Regions

For this study, Indiana was divided into four regions, which were derived from the ten (10) Public Health Preparedness (PHP) Districts in the following manner:

- Central Region = PHP District 5;
- Eastern/Western Region = PHP Districts 4, 6 and 7;
- Northern Region = PHP Districts 1, 2 and 3; and
- Southern Region = PHP Districts 8, 9 and 10.

Ten (10) Public Health Preparedness Districts



Appendix B – Prevalence

The prevalence of dentists in the population could not be determined from the survey responses. However, if one were to assume that the percentage of general dentists practicing in Indiana that took the survey was the same as the percentage of PLA’s ALL dentists that took the survey and were to use this percentage and the number of general dentists in Indiana that took the survey, one could extrapolate the number of general dentists practicing in Indiana, by region, and calculate their prevalence by region. This is what we did, and the presumed *number* and *prevalence* of general dentists practicing in Indiana, by *region*, is presented in Table 4. Next, we calculated the *statewide prevalence* for general dentists practicing in Indiana (0.0389%) by adding the weighted prevalence from each region. Finally, we converted the statewide and regional prevalence as *percentages* into prevalence as the number of *dentists per 10,000* and the *dentist-to-population ratio*, which is more commonly used by the dental profession.

Table 4 **Prevalence** of general dentists practicing in Indiana (March 2012)

Region	Number of general dentists practicing in IN that took the survey	Assumed percentage of general dentists practicing in IN that took the survey	Number of general dentists practicing in IN *	Population	Prevalence of general dentists practicing in IN ^	Weighting ~	Weighted prevalence **	Statewide prevalence ^^	General dentists practicing in IN per 10,000 ^ (Dentist-to-population ^)
Central	585	72.4%	808	1,707,670	0.0473%	0.264	0.0125%		4.73 (1 : 2,113)
East/West	319	72.4%	441	1,290,764	0.0342%	0.199	0.0068%		3.42 (1 : 2,927)
North	566	72.4%	782	2,185,291	0.0358%	0.337	0.0121%		3.58 (1 : 2,794)
South	353	72.4%	488	1,296,168	0.0376%	0.200	0.0075%		3.76 (1 : 2,656)
INDIANA	1823		2519	6,479,893		1.000	sum =	0.0389%	3.89 (1 : 2,572)

* These values were extrapolated from the *number of general dentists practicing in IN that took the survey* and the *assumed percentage of general dentists practicing in IN that took the survey*.

^ These values were calculated from the presumed *number of general dentists practicing in Indiana* and the *population*.

~ These values were calculated by dividing the *regional population* by the *statewide population*.

** These values were calculated by multiplying the *weighting* and the *prevalence of general dentists practicing in IN*.

^^ The sum of the four *weighted prevalence* values is our estimate for the *statewide prevalence* of general dentists practicing in Indiana.