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Oral Health Needs in Indiana:
Developing an Effective and Diverse Workforce

Oral health is an integral part of overall health and wellbeing. Damage to oral structures can result in poor nutrition due to eating difficulties or pain, limitations in speech that affect learning and academic achievement, lowered self-esteem, and decreased social interaction. Every day, millions of children and adults in the United States suffer the burden of oral diseases that significantly affect their quality of life. They may not be aware that oral health is essential to general health, or that oral diseases can be prevented or controlled. Also, they may know these facts but are not able to access needed services. Cavities are not a rite of passage of childhood, and tooth loss and gum disease don't have to be inevitable results of aging.

The two most common oral diseases are dental caries (cavities) and periodontal disease (gum disease). According to the Centers for Disease Control and Prevention, about 78 percent of Americans have had at least one cavity by age 17.[1] Periodontal disease typically affects adults. The National Institute of Dental and Craniofacial Research estimates that 80 percent of American adults currently have some form of the disease.[2] Both dental caries and periodontal disease are infectious diseases that require treatment by dental professionals. To prevent them, continuous monitoring and maintenance is required. Other oral conditions such as cleft lip and palate, oral cancer, and reduced salivary flow can also be prevented or treated.

Those who suffer the worst oral health are found among the poor of all ages, with poor children and poor older Americans particularly vulnerable. Members of racial and ethnic minority groups also experience a disproportionate level of oral health problems. Individuals who are medically compromised or who have disabilities are at greater risk for oral diseases, and, in turn, oral diseases further jeopardize their health.

(Oral Health in America: A Report of the Surgeon General[5])

A Public Health Approach

The oral health of children is a special concern. Extensive tooth decay causes difficulty eating and talking, and inhibition of normal growth. Poor oral health often continues and worsens in adulthood and affects economic productivity and quality of life.[3,4] While growing up, the most common chronic disease that a child will encounter is dental caries, as it is five times more common than asthma and seven times more common than hay fever. Caries is also the most prevalent unmet health need for U.S. children.[3,5] The prevalence of early childhood caries is particularly high among some racial and ethnic minorities and low socioeconomic groups. According to the Department of Health and Human Services, the distribution of dental decay is such that 80 percent of caries in permanent teeth are concentrated in 25 percent of the most vulnerable children and adolescents.[6] Children who are poor, belong to a minority group, or have special needs have higher rates of dental decay, more severe destruction of the affected teeth, higher rates of untreated disease and higher frequency of dental pain than the rest of children.[4]

The oral health of the U.S. population has improved in recent decades due to fluoridation of public water supplies, knowledge about causative agents and risk factors for oral disease, and the development of effective and safe treatment and prevention measures. However, oral diseases continue to affect millions of people in the United States, and, while they can afflict anybody, they disproportionally affect vulnerable population groups, such as racial and ethnic minorities, children (especially those with special needs), low-income citizens, and rural or geographically isolated populations. The Surgeon General's report on oral health in America highlights the disparities in distribution of oral diseases and access to care. The report lists lack of access to care as a major barrier to achieving or maintaining oral health. This lack of access may be due to limited income, lack of insurance, transportation issues, or the flexibility to take time off from work.[5] The Department of Health and Human Services developed a data-driven comprehensive set of disease prevention and health promotion objectives for the United States. These national health objectives, as published in *Healthy People 2010*, were designed to identify the most significant preventable threats to our health and to establish national goals to reduce those threats.

The publication addresses 28 public health areas with specific goals and targets to aim for by the year 2010. Oral health is one of the focus areas with the overarching goal to prevent and control oral and craniofacial diseases, conditions, and injuries and improve access to related services.[6]

Oral Health Epidemiology in Indiana

Although there is a lack of a formal and continuous surveillance system on oral health in Indiana, some state-level information is available from the Behavioral Risk Factor Surveillance System (BRFSS), a random telephone survey of state residents age 18 and older in households with a telephone. The BRFSS, established in 1984 by the Centers for Disease Control and Prevention (CDC), is a state-based monitoring system of health surveys that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. Results from the survey give us a glimpse of the nation's oral health status and allow us to compare Indiana with other states as well as the entire nation.[7] The most recent BRFSS oral health results available for Indiana are from 2006, and include information on three items: visits to the dentist, prevalence of tooth extractions, and prevalence of extraction of all natural teeth.

In 2006, 68 percent of adults in Indiana visited the dentist or dental clinic for any reason within the past year. Indiana's prevalence rate for past-year dental visits has remained stable from 1999 through 2006, but lies below the U.S. median of 70 percent (see Figure 1).[7]

The elderly, minorities, and low income citizens often face the unfortunate need to have some or all of their teeth extracted. After teeth are extracted, more complicated and expensive dental treatment will be needed to restore oral function. It is clear that, as life expectancy for adults continues to increase, there is an urgent need to increase the life expectancy of the natural dentition, too. This is especially important in population subgroups that have limited resources available to afford further or more complex dental treatments.

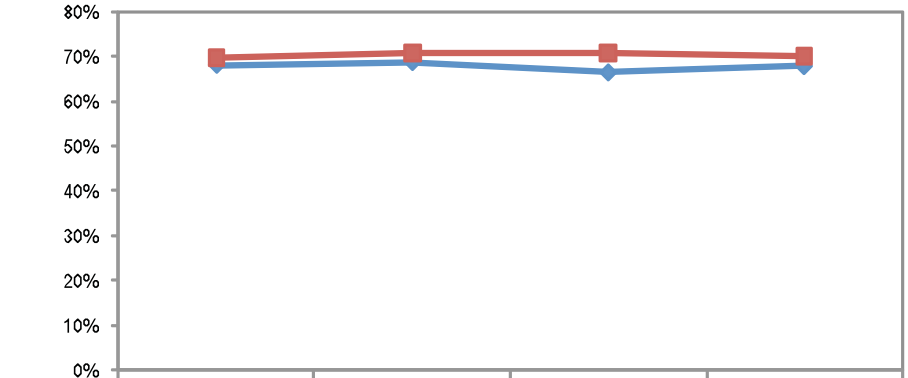
Results from the 2006 BRFSS also indicated that 47 percent of Hoosiers ages 18 and older have had permanent teeth extracted—a percentage that was significantly higher than the national median of 44 percent (see Figure 2). Groups with the highest prevalence of tooth extractions included blacks; individuals with an annual household income of less than $35,000; and individuals with lower educational attainment. Prevalence of extractions was highly associated with age – as age increased so did the percentage of Hoosiers who reported having had any permanent teeth extracted.[7]

Additionally, the survey reported that about one-fifth of Hoosiers 65 years and older had all their natural teeth extracted, a significant decrease from the 37 percent reported in 1999. The current prevalence rates for Indiana and the United States (19.3 percent) are statistically the same. Indiana's elderly that were mostly affected included individuals with an annual household income of less than $15,000 and Hoosiers with lower educational attainment.[7]

Another item that is recorded by the BRFSS is tobacco use. Tobacco products contain a variety of toxins that have been associated with cancers of the mouth, lip, tongue, and larynx (voice box); periodontal disease; and other oral health related conditions.[8] Adult smoking prevalence has been consistently higher in Indiana than the rest of the nation for at least the past nine years. In 2007, almost one-fourth of Hoosiers (24.1 percent) reported past-month cigarette use, compared to one-fifth of U.S. residents (19.8 percent). The prevalence for every-day smoking was also significantly higher in Indiana (18.2 percent) than the rest of the country (14.5 percent); although rates decreased among Hoosiers from 22.5 percent in 1999, to 18.2 percent in 2007.[7]

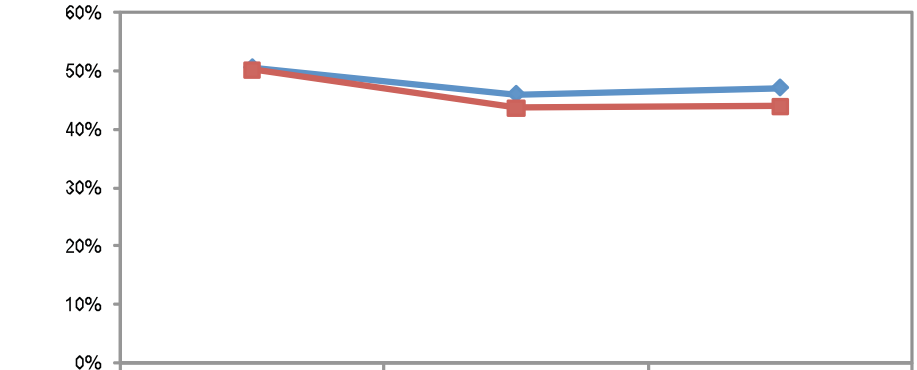
As part of the Federal Balanced Budget Act of 1997, Congress created the Children's Health Insurance Program (CHIP) as a way to encourage states to provide health insurance to uninsured children. Indiana's CHIP (formerly known as SCHIP), a part of Hoosier Healthwise, provides health

Figure 1: Percentage of Indiana and U.S. Population that Visited the Dentist or Dental Clinic within the Past Year for Any Reason (Behavioral Risk Factor Surveillance System, 1999 – 2006)



	1999	2002	2004	2006
Indiana	68.3%	68.9%	66.6%	68.0%
U.S.	69.8%	70.9%	70.8%	70.3%

Figure 2: Prevalence Rates of Indiana and U.S. Adults That Have Had Any Permanent Teeth Extracted (Behavioral Risk Factor Surveillance System, 1999 – 2006)



	1999	2004	2006
Indiana	50.6%	46.0%	47.1%
U.S.	50.2%	43.7%	43.9%

insurance for children in families with household incomes above the threshold for Medicaid eligibility. Based on the 2007 annual report, a total of 70,655 children were enrolled in Indiana's CHIP program (51,957 in CHIP A and 18,698 in CHIP C). Of these, 16 percent were ages 1 through 5, 50 percent were ages 6 through 12, and 34 percent were ages 13 through 18. Seventy percent of CHIP members visited a dentist for a preventive appointment in 2007. Utilization of preventive dental services was similar by race and ethnicity in Indiana, although utilization rates for Hoosier children on CHIP were lower compared to national rates.[9] It is imperative to investigate why not more low-income Indiana children take advantage of these preventive dental services.

[CHIP A is the no-premium component of CHIP which covers children in families with incomes up to 150% of the federal poverty level, FPL ($25,755 per year for a family of three in 2007) who are not already eligible for Medicaid.

CHIP C is the State-designed portion which covers children in families with incomes above 150% up to 250% of the FPL ($42,925 per year for a family of three in 2007) and requires premiums based on a sliding scale of income.[9]]

Populations Most Vulnerable to Untreated Oral Disease

The most vulnerable group of Hoosiers is the uninsured. It has been reported that the number of Americans without dental insurance is three times higher than the number of people without medical coverage.[10] Even though Indiana's rates of the uninsured have been consistently lower than the national rates from 2003 to 2007, and the percentage of Hoosiers without insurance decreased in that time period (from 13.9 percent to 11.4 percent), it is important to note that in 2007, there were still over 0.7 million people under 65 who had no insurance coverage at any time, 83,000 of whom were under the age of 18.[11] The number of people without dental insurance is certainly higher.

Hoosiers that are on Medicaid are another vulnerable group, since coverage of dental services in Indiana is limited to $600 per recipient per year.[12] In 2007, a total of 732,000 Hoosiers were covered by Medicaid, representing 11.7 percent of the population. In regard to race, 444,000 were identified as white; 191,000 as black; 76,000 were Hispanic; 2,000 were American Indian or Alaska native; 2,000 were Asian; and 18,000 belonged to two or more races. The biggest age group covered by Medicaid were children ages 0 to 17 years (466,000); followed by adults ages 18 to 64 (235,000); and adults ages 65 and above (31,000).[11]

Children are particularly vulnerable when families face difficulties in affording medical and dental care. Some of the gaps in insurance coverage have widened in recent years, especially among minority children, and will become even more extensive based on current demographic trends. It has been predicted that the numbers of low-income, minority, and immigrant children will rise more rapidly than the general population of U.S. children.[13] Latinos, for example, constitute the largest and fastest-growing minority in the United States. This population has grown exponentially in recent years, to the point where they constituted 15 percent of the total U.S. population, and almost 5 percent of Indiana's population in 2007.[14] One astonishing fact is that half of the U.S. Latino population is younger than 27 years old, and 20 percent of all U.S. children younger than 5 are Hispanic.[15]

Undocumented immigrant children, who are predominantly Latino,[16] face some of the highest obstacles to obtaining medical and dental care. Not only do they come from very low income families who lack employer-sponsored health coverage, but also, federal law limits eligibility for federally funded health benefits to qualified immigrants with permanent legal residency. In Indiana, undocumented immigrant children qualify only for emergency medical and dental services, and are ineligible for full coverage through Hoosier Healthwise.[17]

The elderly are also a vulnerable group in view of the fact that they suffer from considerable oral disease (gum disease, oral and pharyngeal cancer, dry mouth), cumulative dental problems, decreased income and difficulties accessing dental providers. As a population, it has been reported that people over 65 make up a higher percentage of patients in private dental practices than expected from their representation in the U.S.

population.[18] Medicare does not cover routine dental care or most dental procedures, so that payment for dental services will be out-of-pocket, if they visit the dentist at all.[19]

Populations living in rural areas are also more prone to suffer from untreated oral disease. There are fewer providers in these areas, as the majority of dentists locate their practices in metropolitan areas with populations greater than 100,000.[20] Dental practitioners in rural areas may be overburdened or may only accept patients with dental insurance. Indiana has 50 percent of its counties officially designated as rural.[21] As of 2008, it was estimated that the population for rural Indiana was 1,387,419, or 22 percent of the total population.[22]

Critical Issues and Challenges

To analyze issues of demand and access to dental services, one has to consider the size, distribution and diversity of Indiana's dental workforce and their typical patient pool. The population and, therefore, the need for dental services continue to grow. Demand for services may also rise because of increased popularity of procedures such as dental implants and cosmetic dentistry, and because people are living longer and conserving their teeth longer. However, populations experiencing the most growth are the elderly and young minorities, for whom it is hard to afford even simple dental procedures or preventive services. Another population group that is becoming larger in the current economic climate is the uninsured. Is Indiana prepared for the increased need of dental services by vulnerable populations; and is the Hoosier workforce well distributed geographically, and adequate in number and diversity to treat its increasing population? Available data indicate that this is not the case.

Access to dental care depends heavily on available workforce. The Indiana University School of Dentistry (IUSD) is the only school in the state that educates and trains future dentists. There are also several ADA-accredited institutions that train health professionals in dental hygiene and dental assisting. The availability of dental health professionals in Indiana relies on how many of them establish a practice in the state. According to the American Dental Association (ADA), almost 180,000 dentists were professionally active nationwide, and 1.7 percent of them practiced in Indiana, in 2006.[23] It was reported that about 70 percent of the 498 dentists that graduated from IUSD between 1994 and 1999 remained in Indiana.[21] Between 2000 and 2007, a total of 755 dentists graduated from IUSD,[24] but no data are available about how many of them have remained in the state.

Indiana's ratio of dentist-to-population is low, and it has become progressively worse over the past 17 years. As the population of the state has increased, the number of dentists has decreased. In 1990, Indiana's population was over 5.5 million with almost 3,600 licensed dentists in the state, for a dentist-to-population ratio of 1 to 1,541.[21] In 2007, almost 3,300 dentists practiced in Indiana, serving a population of 6.3 million Hoosiers.[25] This represents a dentist-to-population ratio of 1 to 1:1,923. In other words, the number of active dentists in Indiana decreased from 1990 to 2007 by almost 300, while the population increased by over 0.8 million. It is also important to note that the dentist-to-population ratios vary considerably from one Indiana county to another. For example, in 2007, Newton County had one dentist per 14,014 residents, while Hamilton County had one dentist per 931 residents.[25]

The shift in ratios may be due to a combination of factors, including the continuous increase of the population; a greater number of dentists retiring; and migration of established dentists and recent graduates to other states. Declining dentist numbers are an undeniable problem, but it has been suggested that an increase in numbers of dental health professionals may not be enough to address the challenges that Hoosiers face in accessing oral health care. One of the problems may also be that of a disconnect between the traditional dental practice model, the patterns of disease, and the population that needs care the most.[18] Many dentists do not accept Medicaid patients or limit the number of Medicaid patients they see. This leaves a large part of Indiana's population without dental services.

In 2006, a total of 3,661 dental hygienists were registered in Indiana, for a hygienist-to-population ratio of 1 to 1,722. Again, ratios differed substantially at the community level, ranging from 1 to 923 in Hamilton County to 1 to 10,892 in Crawford County.[21] Even though the ratios were low in many counties, a positive development has been the steady increase in the dental hygienist population over recent years. They constitute a segment of the dental workforce that could help bridge the gaps in access to dental care, if their scope of practice were to be expanded (as has been done in some states and is being considered in others). In Indiana, dental hygienists require direct supervision from a dentist in dental offices, long-term facilities, state institutional facilities, state/federal funded community centers, and depending on their function, in school-system settings.[26]

The Indiana State Board of Dentistry (ISBD) recently released a proposed draft of rules that will change the scope of practice for dental hygienists by allowing prescriptive supervision of hygienists who practice in public health settings. The new rule draft is the result of House Enrolled Act (HEA) 1172-2008, a bill advocated jointly by the Indiana Dental Association and Indiana Dental Hygienists' Association, and passed by the Indiana General Assembly during the 2008 legislative session. The process is expected to be completed by the end of summer 2009.[27]

Historically, racial and ethnic minorities, and the poor have encountered many barriers to accessing dental services. However, in the current economic climate, more people will likely face these troubles as they drop or lose their dental insurance. More people

will not be able to afford dental treatment, putting into question the traditional dental practice model of fee-for-service treatment of insured patients, with lack of alternatives in the delivery or financing of care. Even when people are covered by Medicaid, they may not fare better. Several reasons have been identified to explain the underutilization of dental services offered through Medicaid. The U.S. General Accounting Office reported that the main reason dentists cited for not treating more Medicaid patients was low payment rates. Other reasons included Medicaid administrative requirements (difficulties with handling claims, burdensome pre-authorization requirements, complicated enrollment and eligibility verification process, complicated rules, slow payments) and patient issues (frequently missed appointments that result in loss of time and income, patients who lack awareness of the importance of oral health or lack information about dental benefits).[28] Another issue to consider is that state Medicaid programs do not adjust reimbursement rates on a regular basis, while dentistry experiences increases in production costs—a reported 40 percent from 1993 to 2000.[29] In Indiana, changes in administration of the dental Medicaid program and an increase in fees resulted in improved dentist participation and more use of services in children. However, three-fourths of dentists in Indiana did not participate in the Medicaid program, or provided services to less than 10 Medicaid–enrolled children in 2000.[30]

Workforce issues are compounded by two additional problems: the provider workforce does not mirror the population, and there is a geographic maldistribution of dentists. U.S. dentists tend to be middle-aged, male, and non-Hispanic white. In 2006, the average age of all professionally active dentists in the nation was 49.4 years, and over 80 percent of them were male.[18,23] However, the trend seems to be changing. Among the new professionally active dentists, i.e., those who graduated from dental school in 1997 or later, the percentage of females was higher (36 percent).[23] A major component in the underuse of available dental services may be the culture gap between dentists and patients from varying social and ethnic groups. Underuse or lack of awareness of available dental services may be explained by cultural or language barriers, preferred method of receiving information, or the

Health Professional Shortage Areas

Health Professional Shortage Areas (HPSAs), established under the U.S. Public Health Service Act, are federal designations of a geographic area (usually a county or a number of townships or census tracts) which meet the criteria as needing additional primary health care services. A HPSA scoring system was developed by the National Health Service Corps to determine priorities for assignment of clinicians. Scoring criteria include: population and provider ratio, level of poverty within population, infant health index, and traveling distance to the nearest provider. To be designated as a dental HPSA (DHPSA), the geographic area must have a population to full-time-equivalent dentist ratio of at least 5,000:1, or have a ratio between 4,000:1 and 5,000:1 and unusually high needs for dental services. Dental professionals in contiguous areas must be excessively distant or inaccessible, and overutilized. Members of federally recognized Native American tribes are automatically designated, as are federal and/or state correctional institutions and/or non-profit medical facilities (see table 1).[36] Based on the most recent information on provider-to-population ratio, there is a need to further investigate whether more counties are eligible for a DHPSA designation in Indiana.

Table 1: Dental Health Professional Shortage Areas (DHPSAs) Currently Designated in Indiana, 2008[36]

County	Service Area Name	Destination Type	Score
Allen	Central Fort Wayne	Low Income Population	14
	Neighborhood Health Clinics, Inc.	Comprehensive Health Center	8
Delaware	Open Door/BMH Health Center, Inc.	Comprehensive Health Center	10
	Center Township	Low Income Population	9
Lake	East Chicago Service Area	Geographical Area	15
	East Chicago Community Health Center	Comprehensive Health Center	10
Marion	Highland-Brookside (Indianapolis)	Geographical Area	19
	South Central Indianapolis	Geographical Area	15
	Near North Side (Indianapolis)	Geographical Area	10
	Indiana Health Centers	Comprehensive Health Center	9
	Health and Hospital Corporation of Marion Co.	Comprehensive Health Center	10
	Shalom Health Care Center, Inc.	Comprehensive Health Center	6
	Raphael Health Center	Comprehensive Health Center	10
	Healthnet	Comprehensive Health Center	4
Porter	North Shore Health Center	Comprehensive Health Center	8
	Valparaiso Service Area	Geographical Area	13
	Healthlinc, Inc.	Comprehensive Health Center	8
Randolph	Randolph County	Low Income Population	10
Rush	Rushville Township	Low Income Population	8
St. Joseph	Southwest South Bend	Low Income Population	15
Switzerland	Switzerland	Low Income Population	11
Tippecanoe	Lafayette City	Low Income Population	25
	Tippecanoe Community Health Center	Comprehensive Health Center	11
Vanderburgh	Echo Community Health Care	Comprehensive Health Center	10
Vigo	U.S. Penitentiary Terre Haute	Correctional Facility	21

Note: Scores for DHPSAs range from 1-26; the higher the score the greater the need.

doctor-patient relationship.[15] It has been reported that there is a high correlation between race/ethnicity of dentists and the majority of their patients. This may be due in part to the location of their practices or to a preference for a racially concordant dental provider.[31,32] More importantly, racial and ethnic minority dentists are twice as likely as white dentists to accept new Medicaid patients, and are also more likely to practice in underserved communities.[20,33] Looking at provider-to-population ratios by race/ethnicity, we see that for every 100,000 white residents, there are 55 white dentists. The ratios for blacks and Hispanics are not so favorable, with 15 and 12 dentists per 100,000 residents, respectively.[31]

No data are currently available about race and ethnicity of dentists practicing in Indiana. However, we know that only few students of underrepresented minorities have graduated as dental health professionals from Indiana schools. At IUSD, only 3.6 percent of all graduates from 2000 to 2007 were underrepresented minorities, including 17 Hispanic/Latino graduates, 9 African-American graduates and one American Indian graduate.[34] Almost all dental hygiene graduates from Indiana schools have been Caucasian (99 percent), and the trend is very similar for dental assistants.[35]

Increasing the diversity within the dental profession would be a way of addressing difficulties in access to care and disparities among racial/ethnic minority groups and the underserved.

Thoughts for Policy Makers

The American Dental Education Association (ADEA) emphasizes that every American should receive necessary care for good oral health, and that any comprehensive reform of the U.S. health care system must include coverage and access to affordable oral health services. ADEA has also recognized that the oral health of vulnerable populations has a unique priority, and that a diverse and culturally competent workforce is necessary to address oral health disparities and improve access to oral health care.[37]

Indiana's oral health professionals play a crucial role in improving access to care among all Hoosiers. By developing a culturally competent and diverse oral health workforce, we can improve provider-to-population ratios, increase access to care in minority and vulnerable populations, and provide services in underserved communities. Comprehensive strategies are needed to address these issues and adequately develop and strengthen Indiana's dental workforce. Policy recommendations include:

Increase Medicaid reimbursement rates—Studies suggest a strong correlation between Medicaid reimbursement rates and the number of Medicaid patients seen by dental providers. Increased rates are associated with more dentists participating in the Medicaid program; dentists accepting more new Medicaid patients; and more children on Medicaid receiving dental services.[28,38] Reimbursement rates should be evaluated regularly and, if necessary, increased to be more competitive in the dental market.

Train a culturally competent and diverse workforce—Racial and ethnic minority groups are significantly underrepresented in the oral health field. There is a high correlation between dentists' race/ethnicity and the race/ethnicity of the majority of their patients.[31] Also, black and Hispanic dentists are more likely than white service providers to accept new Medicaid patients and work in underserved areas.[20,33] By putting a greater emphasis on recruiting and retaining underrepresented minorities, dental schools will help create a more diverse workforce and, therefore, improve access to care for underrepresented and underserved populations.

Assist underserved communities—Currently, there are 25 designated dental health professional shortage areas (DHPSAs) in Indiana, but based on most recent information, the actual number of eligible, but not yet designated areas, is probably higher.[36] An important benefit of DHPSA designations is that it allows new graduates working in community health centers in these areas to apply for student loan repayment.

Particularly in rural areas, the number of oral health professionals is low, which makes accessing proper care difficult. Potential solutions to the problem include integrating medical and dental services in community-based healthcare settings (e.g., community health centers with dental clinics); expanding school-based oral health programs to provide screening and basic preventive services, including dental sealants; and incorporating dental screenings into other existing health/medical services (e.g., baby wellness checks).

Oral health care is an important but often overlooked aspect of general health. The "silent epidemic of dental and oral diseases", as Dr. David Satcher (former Surgeon General) called it, can significantly diminish one's quality of life. The poor and racial/ethnic minorities are disproportionately affected.[5] The reasons for these disparities are complex. To help all Hoosiers gain access to dental services, workforce development has to be addressed. Comprehensive strategies to increase provider participation in Medicaid programs; to raise the number of black and Hispanic dentists; and to expand availability of dental services in underserved communities, are needed to boost a dwindling workforce so it can effectively serve Indiana's growing population.

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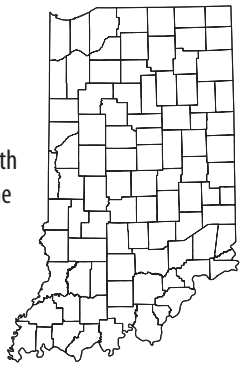

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