

**Medical College of Wisconsin Master of Public Health Program  
PUBLIC HEALTH STUDENT WRITING TUTORIAL**

**SAMPLE RESULTS SECTION #1**

When examining the dental workforce demographics, the *ADA 2005 Survey on the Distribution of Dentists in the United States* provides information on practice locations, specialties, gender, ages, and trends of all dentists in the United States. Most dentists in the United States are general practitioners (80%), male (79%), and operate their own private practices (75%).<sup>1</sup> In the period from 1998 to 2006, the number of dentists in the United States increased on average 10% from 163,291 to 179,594 while the population increased at a rate of 11.1%.<sup>2</sup> In some parts of the country, the dental provider numbers percentage increase exceeded the percent increase in the population. The *ADA 2005 Report* did not find a shortage of dental providers in the country but rather a maldistribution of dentists, and it identified the difficulty many segments of the population have in accessing care. In March of 2007, Kathleen Roth, D.D.S., president of the American Dental Association, addressed the subcommittee on Health and Commerce in Washington, D.C., and described the geographic distribution of dentists along with the lack of Medical Assistance dental providers as a barrier to providing adequate access for dental care to the underserved across the country.<sup>3</sup>

A study by Beazoglou investigated the importance of productivity in estimating the need for dental providers and whether or not true shortages exist.<sup>4</sup> In a market economy, the demand for dental services is not constant over time and is influenced by many factors. The data in this

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<sup>1</sup> ADA, *Distribution of Dentists in the United States by Region and State, 2007*. Retrieved 2/10/10 at: [www.ada.org/members/ada/prod/survey/07](http://www.ada.org/members/ada/prod/survey/07).

<sup>2</sup> Ibid.

<sup>3</sup> Roth, Kathleen DDS. Statement of the ADA to the Subcommittee on Health, Committee on Energy and Commerce US House of Representatives on Improving Access to Dental Care, March 27, 2007. Available at: [http://www.ada.org/prof/advocacy/test\\_070327\\_roth.pdf](http://www.ada.org/prof/advocacy/test_070327_roth.pdf).

<sup>4</sup> Beazo, Tryfon, et al. The Importance of Productivity in Estimating Need for Dentists. *J AM Dent Assoc* 2002; 133; 1399-1404. Retrieved 2/7/10 at [www.jada.ada.org](http://www.jada.ada.org).

study show that by the year 2020, there will be a shortage of almost 10,000 practitioners, but the shortage may be greater if the utilization by the low income population increases at significant rates.<sup>5</sup> The U.S. Department of Health and Human Services, under the Health Resources and Services Administration (HRSA) develops criteria to determine if a geographic area or population group is a Health Professional Shortage Area (HPSA). As of September 2009, approximately 49 million people live in 4,230 HPSAs nationwide. It would take 9,642 dental practitioners to meet their dental health needs and bring the population to dentist ratio to 3,000 to 1.<sup>6</sup> Researcher Shelly Geshan in a Kellogg Foundation Study predicts that by the year 2014, the number of dentists reaching retirement age will outpace new dentists entering the workforce, and the ratio of dentists to population will begin to decline.<sup>7</sup> This decline will affect those in the private sector able to pay for services, but it will have a greater impact on those in the underserved areas.

### ***The Wisconsin Work Force***

In the State of Wisconsin, there is a ratio of 53 dentists per 100,000 people, as compared to the ADA reported nationwide average of 59/100,000.<sup>8</sup> The number falls to 44 dentists per 100,000 when using only general practitioners. The current statistics from the Wisconsin Department of Workforce Development estimates a 9.6% increase in dental positions requiring 90 new jobs yearly for the 2006 - 2016 time period.<sup>9</sup> The *WDA 2010 Report* finds little difference between the expected dentists and the needed dentists from 2010 – 2020. Based on these calculations, by the year 2020, there are expected to be 3,353 dentists practicing in the state

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<sup>5</sup> Ibid.

<sup>6</sup> Health Resources and Services Administration. HPSA Designation. Retrieved 1/19/10 at: <http://bhpr.hrsa.gov/shortage/index.htm>

<sup>7</sup> Geshan, Shelly, et al. A Policy Maker's Guide to New Dental Providers. Retrieved 1/30/10 at: [http://www.nashp.org/sites/default/files/Dental\\_IssueBrief\\_final.pdf](http://www.nashp.org/sites/default/files/Dental_IssueBrief_final.pdf).

<sup>8</sup> DHS, opcit.

<sup>9</sup> Wisconsin Department of Workforce Development. Occupational employment Projections. Retrieved 2/10/10 at: [http://dwd.wisconsin.gov/oea/employment\\_projections/long\\_term\\_projections.htm](http://dwd.wisconsin.gov/oea/employment_projections/long_term_projections.htm).

where the estimated dental need will be 3,358, a shortage of only 5 practitioners.<sup>10</sup> In terms of access to care, the Wisconsin non-Medicaid population should have adequate access to dental care in 2020 since the Wisconsin population and the number of dentists will increase at about the same rate. Dental providers have increased in the state because of the increase in the Wisconsin Gross Domestic Product, attracting more dentists from out of state.

In addition, Marquette University, the state's only dental school, increased its class size from 60 to 80, with a large percentage of students coming from Wisconsin. Statistics from the WDA paper also show that the surpluses and shortages of dentists that will exist are not what might be expected nor correlate with the HPSA designated counties. Some of the larger urban populated counties in Wisconsin – Dane, Racine, Kenosha, Rock, and Washington – will have a shortage of providers, while some of the smaller rural counties – Sawyer, Ashland, and Marathon – will actually have a surplus of providers. These data indicate a shortage predicted for urban areas, while a surplus may exist in the rural areas. Therefore, based on market demand, more dentists are likely to move to the urban areas where demand is greatest. The WDA report does not dispute the fact that there are shortages of dental providers for the underserved populations in the rural areas of Wisconsin that have Medical Assistance or are unable to pay for services. Their position clearly states that increasing the number of dentists from new dental schools will not affect the number of providers in the underserved areas. In the Wisconsin Dental Report, the dentist shortage is predicted to be a total of only five dentists in the next ten years. However, this was calculated with the assumption that increasing the number of Wisconsin residents selected both in-state and in neighboring states will increase those choosing to locate in Wisconsin after graduating.

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<sup>10</sup> Beazoglou, WDA Report, op cit.

According to the WDA, a school in the suburb of Chicago will likely contribute 120 dentists to Wisconsin yearly, thereby adding to the dental pool in Wisconsin. Northwestern University, located in the Chicago suburb of Downers Grove, Illinois, has admitted their first dental school applicants for a class of 120 to graduate in 2015. This new private dental school will welcome Wisconsin residents but will offer no incentives for the Wisconsin students to attend, and they do not expect more applicants from Wisconsin than any other state.<sup>11</sup>

Further limitations of the WDA report include the fact that the market based needs are calculated from the Delta Dental workforce and not a survey or estimate of the dental needs in the state of Wisconsin. The study also had no access to data regarding the dental needs or dental health status of the uninsured in Wisconsin. Furthermore, the uninsured population utilization rates were taken and estimated to be the same as the insured Delta Dental client base in the study. The WDA study also attributed the higher rates of utilization for children covered under the Medical Assistance (MA) program in Wisconsin to the fact that the reimbursement rates are higher for children than adults in the state. What they failed to consider is that many dentists in the state who accept MA patients, limit patients seen to children only or children under 12 years of age, regardless of the difference in reimbursement rates.

In contrast to these findings, the Wisconsin Department of Health Services (DHS) has documented the dentist shortage areas in Wisconsin for the low-income populations.<sup>12</sup> There are no counties currently in Wisconsin that meet the federally recommended number of dentists per low-income population. In the state, 69 of 72 counties had serious shortages of general dentists, and three counties had no dentists with paid MA claims in 2007. The data from the State and WDA are consistent in their reporting of dental demographics. The shortages of

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<sup>11</sup> Higgs, Judith. Director Northwestern University Dental School Admissions. Personal correspondence 01/26/10.

<sup>12</sup> Wisconsin DHS DPH Primary Care Office. Dentist Shortages for Low-Income Populations Wisconsin CY 2007. Retrieved 2/10/10 at: <http://dhs.wisconsin.gov/health/primarycare/index.htm>

provider care are evident in the underserved population groups, along with the lack of providers in those areas willing to participate in the MA program.

### ***For Underserved Populations***

The lack of providers accepting patients insured by the federal Medicaid program is well documented in many studies. The GAO surveyed Medicaid programs for all 50 states and reported that less than half of the state's dentists saw at least one Medicaid patient during 1999.<sup>13</sup> In addition, there were no states where more than half of the dentists saw 100 or more patients. Twenty six states reported less than 25% of their dentists treated over 100 MA patients, and most reported less than a fourth participated at that rate. The ADA 2005 *Dental Workforce Report* found that only 26.7% of the responding dentists treated Medicaid-insured patients.<sup>14</sup> An analysis of fees paid to dental Medicaid providers showed that only 13 states had Medicaid rates that exceeded two-thirds of the average regional fees dentists charged, while only four states – Delaware, Indiana, New Mexico, and South Carolina – paid an average of 75% of the average national fees for the same procedures.<sup>15</sup> All other states paid much less. In New Jersey, the Medicaid reimbursement was only 25% of the average regional fee charged. The State of Wisconsin dentists participating in the Medicaid program follow the national trends. In the 72 counties in the State, there are 2 that have no dental Medicaid providers. Only 1,367 (40%) of Wisconsin licensed dentists submitted at least one fee-for-service claim to Medicaid in 2009.<sup>16</sup> In addition, there were only 223 dentists who saw more than 100 Medicaid patients under the age of 21 years. According to the WDA 2010 *Supply and Demand Report*, Medicaid fees are less than half of Delta Dental fees (which are discounted) for preventive, diagnostic, and restorative

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<sup>13</sup> GAO, op cit.

<sup>14</sup> ADA, op cit.

<sup>15</sup> GAO, op cit.

<sup>16</sup> CDC NOHSS, op cit.

services. With low Medicaid fees and high practice expenses (59.6% of gross billings), the dentists in Wisconsin lose money seeing the Medicaid patients.<sup>17</sup>

The populations that cannot afford the private dentists, or lack access through the Medicaid system for private dental care, have limited options for their treatment. Community health centers and clinics operated by dental and dental hygiene schools, hospitals, and public schools comprise the dental safety net for this population. These safety net centers and clinics only have the capacity to see 10% of the 82 million low income populations.<sup>18</sup> Federally Qualified Health Centers (FQHCs), funded in part by the federal government, and public and voluntary clinics operated by states, county and municipal governments, hospitals, and dental societies serve a small portion of the low income population. Of the approximately 925 FQHC's funded by the federal government, 2.15 million people received care from 1,586 dentists and 547 hygienists in 2005.<sup>19</sup> The centers that target the underserved populations are successful in reaching many in need, but they employ very few dentists. An increase in facilities in the last few years has helped, but the centers still have less than 1% of the total 1,777,686 dentists in the United States.<sup>20</sup> In Wisconsin, the FQHC dental safety net system employs 53 dentists in 15 clinics that provide care (140,000 visits/year) to approximately 61,000 people.<sup>21</sup> In the WDA *Supply and Demand Report*, it was noted that there is a low output of services from the FQHC dental clinics in comparison to private practices. Similar results have been found in other states, and this phenomenon is attributed to the lack of dental operatories and an unwillingness or inability to employ adequate dental auxiliaries to perform services. With the contribution of

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<sup>17</sup> Beazoglou, WDA Report, op cit.

<sup>18</sup> Bailit, Howard, et al. Dental safety Net: Current Capacity and Potential for Expansion. *J Am Dent Assoc* 2006; 137; 807-815. Retrieved 2/03/10 at: [jada.ada.org](http://jada.ada.org).

<sup>19</sup> Ibid.

<sup>20</sup> Roth, op cit.

<sup>21</sup> Beazoglou, WDA Report, op cit.

dental services provided at Marquette Dental School (89,000 visits/year), the FQHC's and the other dental clinic safety nets in Wisconsin, services to the underserved populations are improved, but only marginally, relative to the size of that population.

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**SAMPLE RESULTS SECTION #2**

Regarding a study in Western Kenya, Alaii and colleagues state, “[Insecticide treated net deployment] is apparently simple: one must ensure that the corners of a rectangular ITN are attached to eaves and walls of one’s room, lower the ITN before sleeping, and tuck the ITN under the bed or mat.” However, only 72% of individuals in the study were found to have deployed their ITNs properly.<sup>19</sup> There are numerous factors affecting appropriate use of ITNs to prevent malaria in children under five. Communities have concerns regarding ITNs, and there are environmental, educational, social, and logistical determinants of use.

*Concerns Regarding ITNs*

Communities have expressed numerous concerns regarding ITNs and the chemicals therein. ITNs are treated with pyrethroid insecticides, which have low toxicity to mammals and high toxicity to insects. This results in a high insecticidal knock-down effect, even at low doses, but few adverse affects to people. Pyrethroids are fairly stable and do not break down unless exposed to sunlight or washed.<sup>22</sup> Newer, long-lasting insecticides even remain efficacious despite repeated washing.<sup>23</sup>

In a study of community reactions to ITNs, Alaii and colleagues found individuals in Western Kenya to be distressed about various factors. Many found the chemical smell unpleasant, and some groups attributed flu-like and runny nose symptoms to the chemical. People did not want to sleep under the nets until the smell wore off, and mothers washed their babies’ nets to reduce the smell and prevent suffocation. (Washing was of concern because these

nets had not been treated with long-lasting insecticides; therefore, washing decreased efficacy.) Other individuals thought the chemical in the nets could be a secret fertility control device from the government.<sup>24</sup>

### *Environmental Determinants*

Two main environmental barriers to ITN adherence are heat and perceived lack of mosquitoes. The most common reason cited for lack of ITN use in a study of children in Western Kenya was that nets were “too hot”.<sup>19</sup> Another study found that net use was significantly higher (between 1.2 and 5.0 times higher) in cooler, rainy months than in hotter, dry months.<sup>20</sup> Additionally, a study in Bagamoyo District in Tanzania indicates that lack of mosquitoes prevents use of bed nets.<sup>25</sup> It has been found that many people use nets to prevent nuisance biting, rather than malaria. However, in areas such as East Africa where malaria is endemic, not seasonally-based, the disease can be transmitted even during drier months when mosquitoes are less of a nuisance.<sup>26</sup>

While heat and perceived lack of mosquitoes prevent net use, cold weather and high levels of mosquitoes encourage use. An earlier study in Western Kenya indicates that bed nets were used specifically for warmth.<sup>27</sup> Also, besides using ITNs to prevent nuisance biting, communities often discuss the possibility of ITNs eliminating household pests. Through exposure to the insecticide in the nets, household populations of bedbugs, cockroaches, and rats could be decreased. Unfortunately, these pests create another problem for ITN adherence. It has been reported that rats like to eat the netting,<sup>24</sup> creating holes and further barriers to effective use.

### *Educational Determinants*

Correct knowledge of malaria transmission often affects appropriate use of ITNs. In a study of ITN possession and use in Eritrea, it was found that households demonstrating correct knowledge of malaria transmission were more than twice as likely to have all children under five sleeping under an ITN as those households that did not demonstrate appropriate knowledge.<sup>4</sup>

If individuals do not understand how malaria is transmitted and how ITNs break the transmission cycle, they are less likely to use their nets effectively. For instance, before the beginning of their trial, Alaii and colleagues found that 75% of mothers recognized mosquitoes as the cause of malaria, but only 27% understood that mosquitoes are the sole cause. Forty-seven percent believed that getting cold was the sole cause of malaria.<sup>27</sup> If individuals do not understand mosquitoes to be the only cause of malaria, they may concentrate their efforts on reducing other perceived causes, rather than proper deployment of ITNs.

However, correct knowledge of malaria transmission is not always found to be a determinant of bed net use. In a study in Ghana, De La Cruz and colleagues did not find that those who utilized a bed net had a significantly higher level of knowledge regarding methods of protecting against malaria. Also, there was no difference between those who used bed nets and those who did not in measurements of their ability to identify the correct cause of malaria or the groups most vulnerable to the disease.<sup>21</sup>

### *Social Determinants*

Children under the age of five are most vulnerable to malaria and are best protected by the use of bed nets because their longer sleeping hours are more likely to include the most intense mosquito biting hours of dusk; whereas, adults are less likely to be protected during those

hours.<sup>20</sup> Despite this, studies have shown that in communities in Western Kenya, children are less likely than their parents to sleep under an ITN. Because of their age and status as income earners, parents have priority access to the household's ITN. Mothers explained this custom to Alaii and colleagues:

*There is no money to buy extra beds and bed nets, and furthermore, when they sleep on a hard surface like that they learn to appreciate that the comforts of life are not easy to come by. Children are still young and can endure lack of sleep due to mosquito nuisance. It is the adults who have to struggle to provide for them that need to sleep well.*<sup>22</sup>

A study of sleeping arrangements and bed net use in Uganda found that children are more likely to sleep under an ITN if their mother uses one, and it was noted that youngest children are most likely to utilize an ITN. The authors attributed these findings to the same issue listed above. Parents have preferential use of an ITN, and protection of children is merely a coincidence when children happen to sleep in the same bed.<sup>28</sup>

In a study of factors affecting the use of bed nets in Western Kenya, the most common social reason cited for children's lack of ITN use was that there was disruption of sleeping arrangements. Because of visitors, whether for funerals or other reasons, it is common for sleeping arrangements to be changed. However, because it is not as easy to re-hang a net as it is to find a new spot on the floor to sleep, sleeping arrangement changes often prevent the use of an ITN.<sup>19</sup>

Other social reasons cited for children not sleeping under an ITN include:

- Child temporarily lacks caregiver
- Child is a visitor, not a resident
- Child's net used by another
- Forgot to put up the net
- Cannot use since child is sick
- Funeral affected net use
- Child is usually at another house
- Visitor is using child's net

- Mother or caregiver is away
- Child fears ants will climb up net<sup>19</sup>

As explained above and demonstrated in the list of reasons for children not sleeping under an ITN, children's status in society is an important factor. Parents are given preferential use of ITNs, and visitors are often given priority as well.<sup>19,28</sup> Other barriers to proper ITN adherence include the question of responsibility for childcare. When children lack caregivers, they are less likely to sleep under an ITN. Finally, lack of motivation is a further barrier to ITN adherence.<sup>19</sup> Motivation is a key factor in ITN use and could be promoted through effective education.

### *Logistical Determinants*

In a study of factors affecting the use of bed nets in Western Kenya, the following were listed as logistical reasons children did not sleep under an ITN:

- No room to hang child's net
- House reconstruction affects net use
- Net is too small for bed or mat
- Child rolls out of net
- Roof is leaking, so cannot spread the net
- Cannot hang the net properly
- Child's net has been taken for mending
- Difficult to spread net over mat
- Returned home too late to put up the net
- Net is too hard to put up and take down
- Child's net is torn
- Child's net was washed<sup>19</sup>

Many of the reasons listed deal with problems of space and house construction,<sup>19</sup> and some of them deal with sleeping arrangements, as described previously. Because all rooms in a house are considered places where people may sleep,<sup>22</sup> children often sleep in the kitchen or sitting room, resulting in a need to remove and re-hang the bed net each day.<sup>19</sup> Populations have indicated that this process is tiresome and problematic.<sup>22</sup> However, a positive determinant of

ITN use is that bed nets were described as useful to avoid roof debris<sup>25</sup> and have been utilized for this reason.