



# The Impact of Hearing Loss in Older Adults in North Carolina

Report to the  
North Carolina General Assembly  
and the  
N.C. Study Commission on Aging

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North Carolina Department of Health and Human Services  
Division of Services for the Deaf and the Hard of Hearing

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## Executive Summary

Estimates show that the numbers of older North Carolinians with hearing loss will more than double in the next 20 years. This is a result of a confluence of multiple factors, including the aging of the Baby Boomers, increased life expectancies, in-migration of adult population to North Carolina, and an increase in activities that can result in hearing loss (such as the use of personal stereos).

In an effort to prepare for this increase, the North Carolina General Assembly instructed the Department of Health and Human Services to study the impact of hearing loss on North Carolina's older adult population and to report to the North Carolina Study Commission on Aging.

Hearing loss in an older adult tends to happen gradually and is not always identified, and less often treated. This presents a barrier to access to community services and can isolate one from one's own family. Untreated hearing loss can lead to deterioration in mental and physical health. For people in the labor market, untreated hearing loss means reduced income.

One of the most effective treatments for hearing loss is hearing aids. Hearing aids are expensive, ranging in price from \$1,400 to \$5,000 depending on type. Generally, people with hearing loss have better results with two hearing aids, increasing the cost. Hearing aids for adults are not normally covered by public or private health insurance.

Diagnosis and treatment of hearing loss alone are insufficient to effectively address it. Hearing loss is so poorly recognized and understood that extensive education to the greater community as well as consumer protection mechanisms are necessary. Just as essential to ensuring the effectiveness of treatment is the extensive community support emphasizing well-being and independence.

This study, as directed by S.L. 2008-181, addresses the four areas.

- The availability of and access to qualified professionals for diagnosis and treatment: Although the services seem to be available in the state, lack of awareness and information about the opportunities for addressing hearing loss keeps older adults from seeking needed treatment and related services.
- The availability and access to hearing aid purchase assistance programs for low-income individuals: Multiple nonprofit organizations help with the purchase of hearing aids, but their declining financial assets along with strict eligibility requirements limit access for older adults. Health insurance plans (including Medicare and Medicaid) do not cover hearing aids for adults.
- The development of and inventory of adaptive technology options available to assist older adults with hearing loss: Improvements in technology expand the list of adaptive technology available. Choice for older adults is a matter of obtaining the information on what, where and how to obtain devices. Gathering places for older adults could serve clientele better if they had assistive equipment available on-site.
- An assessment of resources available in other states that are used to offset problems associated with hearing loss: Some states have more progressive policies addressing hearing loss in older adults than North Carolina does. Examples include mandatory telecoil disclosure, low interest loans to people with disabilities, programs to make law enforcement and emergency personnel aware of an individual's hearing loss, insurance coverage in state health plan, mandated trial period for hearing aids, mandated insurance coverage, and retirement communities and nursing homes specializing in serving Deaf people and people with hearing loss. Fifteen states mandate insurance coverage for hearing aids, and thirty states provide Medicaid coverage for hearing aids for adults.

Based on this study, the Department of Health and Human Services, Division for Services to the Deaf and Hard of Hearing makes the following recommendations:

- Establish a task force to assess the feasibility of developing and implementing a formal system that optimizes consumer capacity to evaluate quality of hearing aid services prior to and during the process of purchasing hearing aids.
- Enact legislation that would require all hearing aid dispensers provide a minimum of a 30-day trial period with money back guarantee and instruction on the function of the telecoil and its use.
- The General Assembly should consider legislation requiring hearing aid health insurance coverage for all ages from any private agency providing health insurance and doing business in North Carolina and from any public agency providing medical insurance coverage assistance.

Because hearing loss in older adults is so prevalent and can impact one's health and independence, it raises public health and economic concerns. Opportunities exist, however, to address these concerns. By strengthening the current system of diagnosis and treatment, ensuring the affordability of treatment and expanding a statewide system of education and community support, the General Assembly can assure that Deaf, Hard of Hearing and Deaf-Blind North Carolinians will age well.

## Context Leading to Study

Section 12 of S. L. 2008-181 was incorporated in the “Studies Act of 2008” in response to the growing concerns of hearing loss issues specifically among the older adult population coupled with the ramifications of untreated hearing loss. This bill directed the North Carolina Department of Health and Human Services to study the impact of hearing loss on North Carolina’s older adult population regarding access to qualified professionals for diagnosis and treatment, access and availability to hearing aid purchase assistance programs for low-income individuals in the state, development and inventory of adaptive technology options, and assessments of resources and programs available in other states.

To understand hearing loss and its impact on a person’s life, two presuppositions must be identified.

First, it must be recognized that hearing loss, in and of itself, is complex in nature. It creates one of the most complex of all human needs—the need for effective communication without hearing. There exists a general misconception regarding the hearing loss population as a whole. Though some similarities and common traits among people impacted by hearing loss can be cited, it must be acknowledged that three distinct hearing loss populations exist—Deaf, Hard of Hearing and Deaf-Blind.

Because differences between people who are Deaf, Hard of Hearing and Deaf-Blind exist, consideration of service provision should be based on person-centered principles. Service providers must not only consider the person’s degree (level) of hearing loss but also individual characteristics (for example, family and friends, race, ethnicity or language, personal choices, life activities, environment, any physical or cognitive limitations that could prohibit use of assistive equipment, communication needs and his/her general health) in the assessment in order to provide the most effective services. Often, these services are time- and labor-intensive.

Secondly, due to the wide variations in the type, degree, onset and etiology of hearing loss, it is difficult to obtain hard and fast data on the prevalence of hearing loss. Data gathering tools used to enumerate hearing loss populations only provide a statistical estimate, not an exact population total. The two leading sources and tools used for health statistical information gathering are *The National Health Interview Survey (NHIS)* and the *National Health and Nutrition Examination Survey (NHANES)*.

Both the NHIS and the NHANES surveys formulate data sets based on the self-reporting of hearing loss from each individual interviewed. It must be noted here that “denial” or the non-acceptance of hearing loss and “vanity” due to the stigma associated with hearing loss are two prominent reasons cited for a person not to seek treatment for his/her hearing loss.<sup>1</sup> Because hearing loss is often gradual in most individuals, a false sense of normalcy develops thereby making hearing loss an “invisible” disability. Without the realization of hearing loss in the person’s life, misconceptions on abilities and self-perceptions will cause inaccurate reporting of such leading to further misconstrued statistical information.

Therefore, data can appear skewed at times; it is common to find diverse estimates of the current hearing loss population of the United States cited at 28 million,<sup>2</sup> 31.5 million,<sup>3</sup> 37 million,<sup>4</sup> or as high as 55 million.<sup>5</sup>

Older adults face many challenges in their lives as complications of access to needed services begin to interfere with once active lifestyles. The challenge of hearing loss brings a whole range of diverse issues that have often been misunderstood and neglected. Those with hearing loss, whether Deaf, Hard of Hearing or Deaf-Blind, often experience tremendous barriers to accessing basic resources in their communities, including education, employment, housing, transportation, health care, emergency services, telecommunications, recreation and even their own families and social networks. The most common barriers are lack of access to communication, lack of understanding of the indicators and consequences of hearing loss, insufficient resources to effectively advocate for themselves in obtaining services and lack of knowledge of existing resources available to them.<sup>6</sup>

The approach taken by the Division in the completion of this study can be divided into three distinct tasks: 1) Division research; 2) Survey of Randomly Selected Skilled Care Facility Directors; 3) Study Group.

- 1) Division staff engaged in research seeking the most up-to-date studies and demographics information. Research facilities, national organizations on hearing loss, other Divisions within the Department of Health and Human Services and other NC governmental agencies were contacted. The Division also sought feedback from customers statewide;
- 2) A basic survey of a randomly selected sample of directors in North Carolina skilled care facilities such as nursing homes and home care facilities was performed. Facility directors were asked to respond to a total of 12 questions on general issues associated with hearing loss and his/her facility. A total of 543 surveys were mailed with a return of 254 at a return rate of 46.7%. The survey period was for one month. The information was tallied and the following results stood out:
  - a. 56 % of the directors rated themselves less than knowledgeable (somewhat knowledgeable, not knowledgeable or unsure) of hearing loss impact on older adults;
  - b. 72 % of the directors stated that no hearing loss professionals (audiologists or hearing instrument specialists) make visits to their facility;
  - c. 68% were not aware of hearing aid purchase assistance programs;
  - d. 79% knew of no resources or programs for hearing loss located outside of North Carolina;
  - e. 63% do not provide hearing loss assessments as part of the intake process;
  - f. 54% consider the facility to be fully accessible for ALL persons with hearing loss in accordance to the Americans with Disabilities Act;
  - g. Many of the directors expressed desire to learn more about hearing loss issues and wanted more information
  - h. Several of the directors made specific comments requesting assistance through Medicare and Medicaid to assist residents in the purchase of hearing aids;
- 3) The Division formed a study group consisting of professionals from diverse backgrounds. Members were professionals in the hearing care industry, professionals and representatives within the aging industry, service providers within state and private industries, members of grassroots organizations associated with the Division and consumers. Diversity was represented in membership ethnically, culturally and by disability. The group's charge was to review the four points of study given by the General Assembly. Members of the Study Group are listed below:

Johnnie Sexton, Chair, Hearing Aid Dealers and Fitters Licensure Board  
Mary Bethel, Associate State Director for Advocacy, AARP—North Carolina  
Valerie Bateman, Deputy Attorney General, NC Office of the Attorney General  
Bill Lamb, Associate Director of Public Service, UNC Institute on Aging  
Julie Bishop, Vice-President, Hearing Loss Association of North Carolina  
Liz Belk, Interpreter, NC Registry of Interpreters for the Deaf  
Kathryn Lanier, LTC Ombudsman Program Specialist, Div. of Aging and Adult Services  
Angela Bright-Pearson, Audiologist, Bright Audiology and Speech, Inc.  
Ruth Miller, President, NC Council for the Deaf and the Hard of Hearing  
Judy Smith, Program Manager, Div. of Aging and Adult Services  
Lorene Roberson, Specialist, NC Assistive Technology Program  
Ronda Owen, Clinical Policies and Programs Manager, Div. of Medical Assistance  
Joan Black, Co-Owner, Triangle Audio Communication Systems, Inc.  
Alfedia Harris, Consumer, NC Deaf-Blind Associates  
Victoria Bottoms, Hearing Instrument Specialist/ Owner, Down East Hearing Care Center  
Gene Griffin, Hearing Instrument Specialist, Association of Hearing Care Professionals  
Swarna Reddy, Evaluator / Planner, Div. of Aging and Adult Services  
Tovah Wax, Psychologist, NC Association of the Deaf  
Julia Leggett, Policy Coordinator, ARC and NC Association of the Deaf

Mary Williamson, Consumer, Deaf Seniors of NC  
Joan Pelletier, Director, Triangle J Area Agency on Aging  
Dick Hatch, Retired Attorney, NC Coalition on Aging  
Dee Hatch, President, NC AARP  
Ron Quillet, Technology Resources Coordinator, DSDHH (Ex-Officio)  
Jeff Mobley, Hard of Hearing Services Manager, DSDHH (Ex-Officio), Facilitator  
Jan Withers, Director, DSDHH (Ex-Officio)

## Presentation of the Findings

In March 2008 the Division submitted to the North Carolina Study Commission on Aging a preliminary interest report which provided basic information on hearing loss issues faced by older adults in North Carolina. This same report expressed key areas of concern based on comments and feedback received by consumers across the state. Some of this feedback was quite unsettling. The Division's intent was to highlight problematic areas and establish the need for further study and evaluation with the hope of identifying appropriate solutions that will benefit older adults with hearing loss to and reporting such findings to policy makers.

A substantial number of service providers, managers, administrators and policy planners in various private and public entities across the state are unaware of the resources available to Deaf, Hard of Hearing and Deaf-Blind people they serve. In addition, their needs often are not considered or understood when policy, procedures and programs are developed.<sup>7</sup>

To understand the total ramifications of hearing loss in older adults, it is necessary to look beyond barriers to service delivery and look at other areas of impact. The first area to consider in understanding the full impact is to gain an idea of the number of people whose lives are impacted. The second area to consider is the fiscal impact of hearing loss as a whole—to the individual and the general economy.

First, the numbers of people impacted with hearing loss in their lives may be surprising. "One of three U.S. adults already suffers from some degree of hearing loss and the use of personal stereos and an aging population **may create a hearing impairment epidemic**, researchers said."<sup>8</sup>

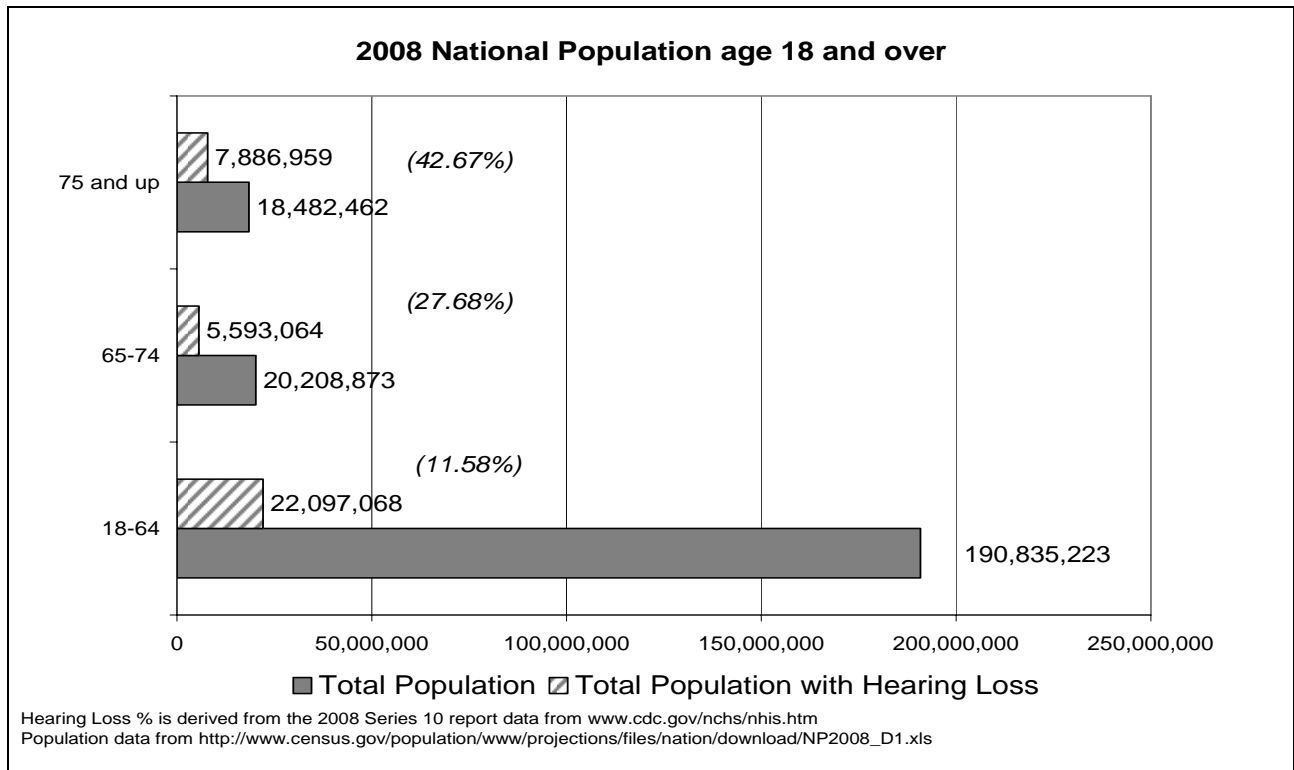
"By 2030, the number of older adults is projected to increase 59% while older adults with hearing loss will double. The increased number of older adults with hearing loss **will present a major public health problem and increased demand for health care services**."<sup>9</sup>

The above quotations may elicit alarmist tendencies; however they serve as strong indicators for service provision agencies when considering the incidence of hearing loss, now and in the future. Review of the data and projections available verifies the necessity for preparation in order to face the predicated increased demand.

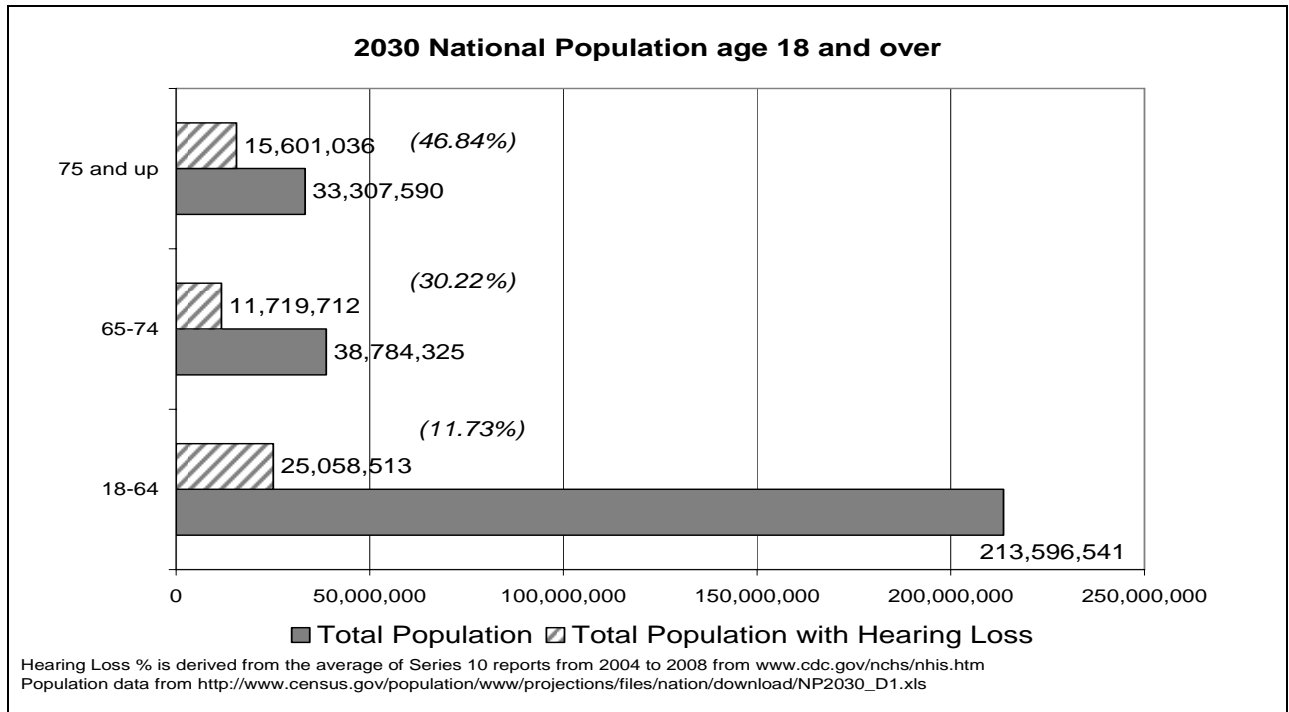
According to the U.S. Bureau of Census, the older adult population in 2030 is projected to double that of 2000, growing from 35 million to over 72 million. In the two decades between 2030 and 2050, the older adult population growth is expected to slow as those born in the late 1960's and 1970's enter the older age brackets. Projected growth for this time period is 15 million bringing the total of older adults age 65 and older to approximately 87 million.<sup>10</sup>

Table 1 on the following page illustrates clearly the current population totals and the national incidence of hearing loss. Table 2 presents the same information for the national scene as projected for 2030. As one notices the increase in totals, the impact from the influx of Baby Boomers into the aging population is obvious. These tables are specific to the adult population, 18 and older, in the United States.

**Table 1—National Incidence of Hearing Loss Totals for Adults age 18 and Over: 2008**



**Table 2—National Incidence of Hearing Loss Totals for Adults Age 18 and Over: 2030**



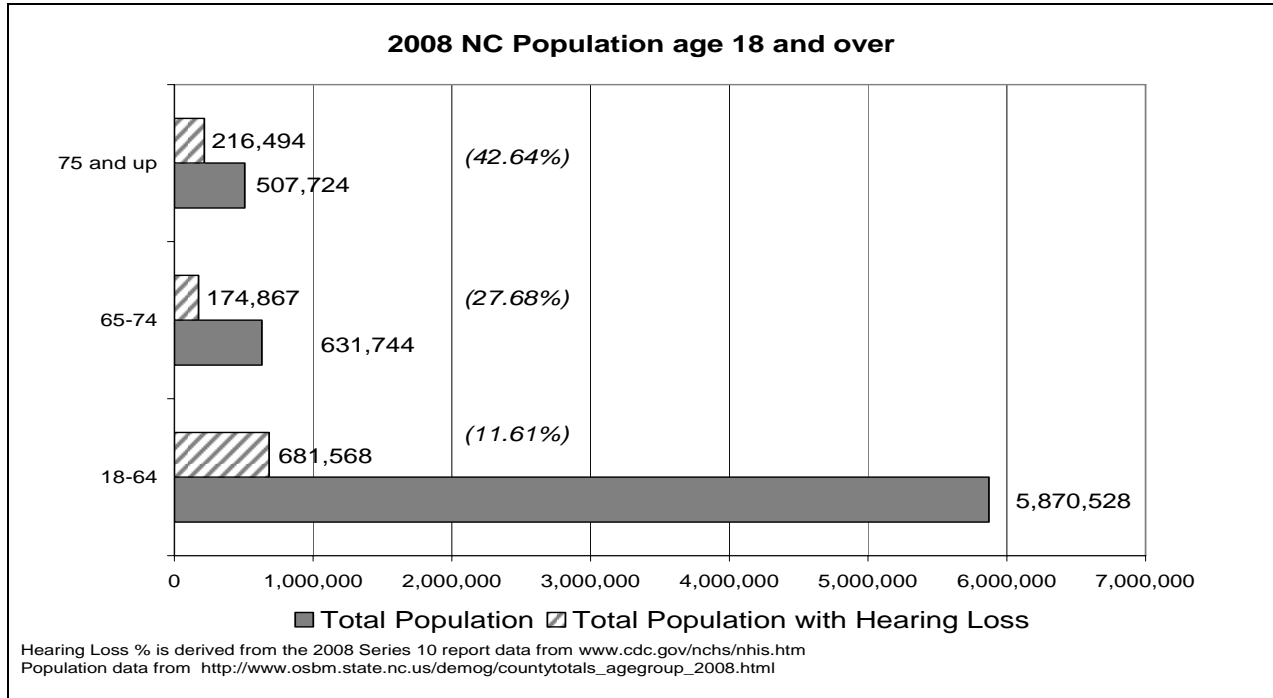
The same growth pattern projected for the United States can also be anticipated here in North Carolina. Projections for the year 2029 indicate North Carolina will increase in population to over 12 million people. With this general population growth, will come increased incidence of hearing loss. Currently, statistics indicate a 15.31% incidence of hearing loss for all adults over 18 with a projected increase to 17.50% in



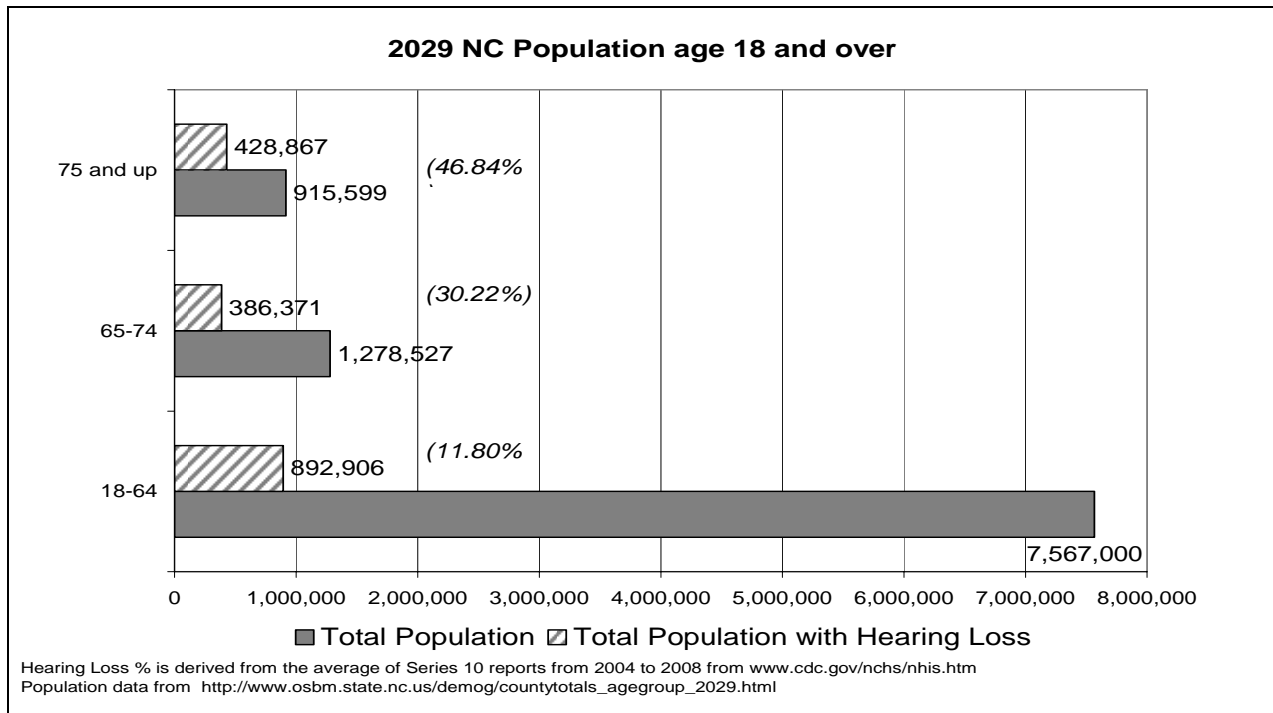
2029. \*(OSBM State Demographics Office list projections to year 2029 unlike U.S. Census Bureau's 2030 projections)

The following tables show this same growth pattern in North Carolina populations. Table 3 presents a comparison of the adult population and hearing loss incidence for the year 2008. Table 4 presents the same comparison as projected for the year 2029.

**Table 3: Incidence of Hearing Loss, Age Specific Categories, for Adults 18 and Over: 2008**

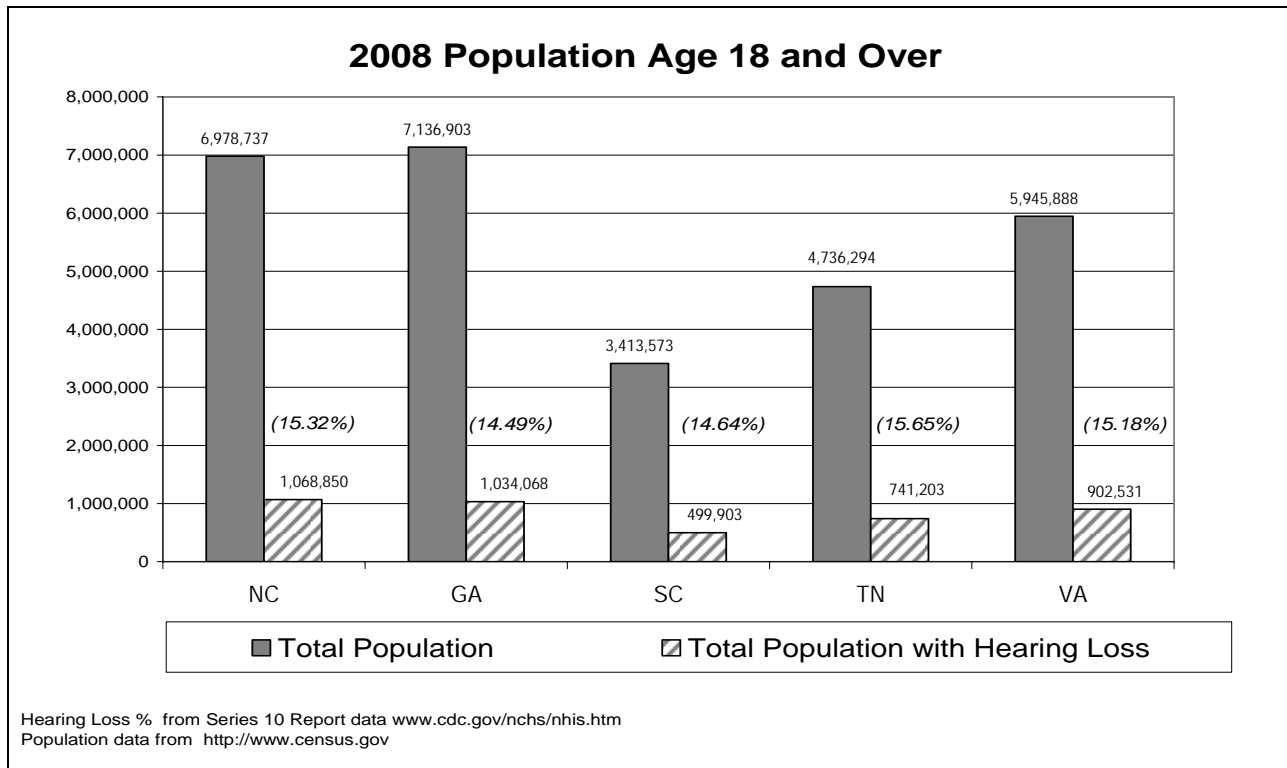


**Table 4: Incidence of Hearing Loss, Age Specific Categories, for Adults 18 and Over: 2029**



One additional table of interest is also presented. Table 5 below is a comparison of states surrounding North Carolina for the year 2008. Note that North Carolina ranks second in total population of adults 18 and over. However, North Carolina ranks first in number of adult residents with hearing loss. States compared to North Carolina include Georgia, South Carolina, Tennessee and Virginia.

**Table 5: Regional Comparison of States, 2008**



The second area of impact beyond service delivery is the fiscal impact resulting from hearing loss. There is a direct connection between lost income associated with hearing loss and the use of hearing aids according to the results found by the 1999 study of the National Council on Aging.<sup>11</sup> This study revealed a differential of \$13,000 per year among non-users of hearing aids between those with mild hearing loss and those with profound hearing loss. For hearing aid users, the difference in earned annual income was \$7,000.<sup>12</sup>

This study also clearly noted that hearing aid users report more discretionary funds than did non-users, meaning the non-users were less likely to be able to afford the purchase of hearing aids, thereby exacerbating the real problem.<sup>13</sup>

Sergei Kochkin, Executive Director of the Better Hearing Institute, estimates a total lost income for people in the U.S. with untreated hearing loss at \$122 billion thereby creating an unrealized \$18 billion in Federal taxes.<sup>14</sup>

Kochkin states that for a large portion of the Hard of Hearing population in the workforce, making decisions to seek hearing aid treatment can illicit a negative impact on total job performance, job effectiveness, opportunity for promotion, and perhaps lifelong earning power and lower income in the retirement years.<sup>15</sup> Communication on the job is highly critical for successful job performance.

In his “The Impact of Untreated Hearing Loss on Household Income” Kochkin assumes that 95% of the total hearing loss population can benefit from hearing aids yet only 23% actually own and/or use such technology. The remaining 77%, suffering anywhere from a 10% to a 100% loss of hearing, do not. Each compounded 10% or decile loss equates to a corresponding \$1,000

income loss. Kochkin also supplies a percentage breakdown of the non-user/non-owner population for each decile of loss. Using these figures on North Carolina specific data, we know that 95% of the total hearing loss population (age 18 and up) is approximately 1,019,282. Of these, only 234,435 (23%) use/own an assistive aid. The remaining 784,847 (77%) continue working with a hearing loss and earning less as a result. The table below takes these assumptions above and applies a 15% tax rate to portray potential income loss and potential unrealized taxes. ([http://www.betterhearing.org/hearing\\_solutions/qualityOfLifeDetail.cfm](http://www.betterhearing.org/hearing_solutions/qualityOfLifeDetail.cfm)) See Table 5 below.

**Table 5: Lost Income and Unrealized Tax Dollars Resulting from Untreated Hearing Loss**

<b>2008 NC Population Age 18 and Up (OSBM estimates)</b>				
Hearing Loss in Decile	Current Distribution for non-owners	Population Size	Annual Income Lost (in '000)	Annual unrealized taxes (in '000)
10%	18%	142,057	\$ 142,057	\$ 21,309
20%	17%	133,424	\$ 266,848	\$ 40,027
30%	15%	114,588	\$ 343,763	\$ 51,564
40%	12%	94,182	\$ 376,727	\$ 56,509
50%	11%	84,764	\$ 423,818	\$ 63,573
60%	8%	63,573	\$ 381,436	\$ 57,215
70%	7%	53,370	\$ 373,587	\$ 56,038
80%	6%	44,736	\$ 357,890	\$ 53,684
90%	4%	32,964	\$ 296,672	\$ 44,501
100%	3%	21,976	\$ 219,757	\$ 32,964
		785,632	\$ 3,182,556	\$ 477,383

Below are the summary reports of each study area designated by the General Assembly. The Division presents information compiled from all methods of research used for each area of the study. Recommendations based on these findings will follow in the next section titled "Recommendations for Consideration and Action."

**Study Area 1: *The availability of and access to qualified professionals for diagnosis and treatment.***

Untreated hearing loss has serious emotional and social consequences for older adults according to the 1999 report from the National Council on Aging study of "The Consequences of Untreated Hearing Loss in Older Adults." The study debunks the myth that hearing loss in older adults is a harmless condition.<sup>16</sup>

This report, though now ten years old, presents a compelling argument for the social, psychological, cognitive and health effects of hearing loss. The issues raised and the points made are equally as prominent and relevant to 2009.

The inability to effectively communicate due to hearing loss leads to greater isolation and withdrawal and therefore lower sensory input. As a result of a constricted lifestyle, there is a negative impact on the psychological well-being of the individual.

Research is now finding stronger association of hearing loss with the following: embarrassment, fatigue, irritability, tension and stress, anger, avoidance of social activities, withdrawal from social situations, depression, negativism, danger to personal safety, rejection by others, reduced general health,

loneliness, social isolation, less alertness to the environment, impaired memory, less adaptability to learning new tasks, paranoia, reduced coping skills, and reduced overall psychological health.<sup>17</sup> Those with untreated hearing loss reported higher levels of sadness and depression, higher levels of worry and anxiety, less participation in social activities, higher rates of paranoia and greater tendencies to describe themselves as insecure, irritable, fearful or tense. The more severe the hearing loss, the higher the percentages of occurrence.<sup>18</sup>

Not only can a person's psychological welfare be impacted by hearing loss, but it can also create negative consequences on a person's quality of life because of the medical and physical health impact it brings. Hearing loss ranks as the third most chronic, but treatable, condition among older adults behind arthritis and hypertension.

A study performed by Johns Hopkins University of Baltimore, Maryland found the disparities in health and health risk behaviors indicated adults with hearing loss had poorer health and increased risk of engaging in health risk behaviors than adult with good hearing. They found that Whites were more than twice as prone to hearing loss than Blacks and the men were twice as likely as women (21 versus 11 percent) to have speech-frequency hearing loss.<sup>19</sup> The Center for Disease Control (CDC) reports the prevalence of adults with fair or poor health at 10.5% of those with good hearing, 17.5% of those with a little trouble hearing and 28.9% of those deaf or a lot of trouble hearing.<sup>20</sup>

Identifying the barriers to optimal medical care and services has been attempted many times. Yet, even with research and studies presenting strong evidence to a link between hearing loss and health issues, only 12.9% of all physicians screen for hearing loss during routine examinations.<sup>21</sup>

Loss of hearing not only requires good medical care, but also the services of many other professionals. People with hearing loss need access to reputable hearing aid dispensers. They also need access to professionals unrelated to their hearing loss. Professionals ranging from emergency personnel, educators, public servants, legal staff, etc. are key to the success of a person effectively handling their hearing loss.

The Division daily receives communication from North Carolinians across the state expressing concerns about experiences encountered with some hearing health care providers, specifically some hearing aid dispensers. In review, most of these experiences typically involved the same problems related to a 30-day trial period, refund practices or unexpected fees.

Some of the standout situations reported to Division staff are summarized below:

- Upon returning the hearing aid, within the 30-day trial period, the dispenser convinced the consumer to go through adjustments resulting in the trial period expiring;
- Repairs or adjustments needed during the trial period interfered with allowing consumers adequate time to try the hearing aid without interruption;
- Consumers could not get a refund for an undesired hearing aid or could not get the refund in a timely manner;
- Consumers were not aware of any additional charges applied and required if the hearing aids were returned (known as holdback fees); consumers had not been told a fee may apply;
- Consumers were given paperwork to sign all at once and claimed there was no instruction or explanation on what the forms meant. They were instructed to sign them before any assistance could/would be given. Often times these forms included contract to purchase, credit check, application authorization and waiver of physician examination;
- Consumers had fears their hearing evaluation which was performed in an inappropriate and noisy environment was not valid;
- Hearing aid fitting performed without regard to cognitive function of the patient and hearing aids were dispensed to inappropriate candidates; e.g., persons with dementia. No consultation had occurred between dispenser and social worker. In one case cited a

dementia patient thought her hearing aid was candy so she tried to eat it and ingested the battery.

The Federal Trade Commission which monitors the business practices of hearing aid dispensers allows trial period mandates to be determined by each state. In the State of North Carolina, there is not a 30-day trial period mandated. Most dispensers in the state do provide a minimum 30-day trial period as a gesture of good customer service though no law requires them to do so.

The Division's staff also has received feedback from many of its consumers that they were unaware of the process of obtaining a hearing aid, often confused by the technical language used by dispensers, and unsure of the appropriate type of professional they would need to see. *Consumer Reports* and *MarkeTrak VII* (a report series by the Better Hearing Institute which utilizes the National Family Opinion Poll survey data) both report that survey respondents could not always differentiate a doctor, audiologist or a hearing instrument specialist.<sup>22</sup>

The first step toward better understanding of professionals available is to comprehend the working definition of "qualified" professionals applicable to older Deaf, Hard of Hearing or Deaf-Blind adults.

**A. The varying professionals that may be qualified to work with these populations include:**

1. Ear, Nose, Throat (ENT) physicians, or otolaryngologists, are MD's that focus specifically on the medical evaluation and treatment of ear, nose, and throat disorders. Otolologists focus more narrowly on the medical and treatment of ears and hearing disorders.

2. Audiologists have Master's or Doctorate degrees in the diagnosis and treatment of hearing loss. Doctorate degrees are now required by the American Board of Audiology. Those with Master level degrees were licensed prior to 2007. Audiologists may test children as well as adults and are trained broadly in the areas of medical/otologic issues, balance disorders, counseling, hearing aid dispensing, and aural rehabilitation. In North Carolina they are licensed in audiology by the NC Board of Examiners for Audiology and Speech-Language Pathology and by the NC Hearing Aid Dealers and Fitters Board to dispense hearing aids.

3. Hearing Instrument Specialists must have a minimum of a high school diploma and serve a one year supervised apprenticeship period. Many of these specialists have advanced degrees and often earn additional advanced credentials available through national organizations. Hearing Instruments Specialists test hearing only for the purpose of fitting hearing aids and their training, broad in nature on hearing loss, is focused primarily in that area. They are also licensed by the NC Hearing Aid Dealers and Fitters Board.

4. Speech-Language Pathologists have a Master's degree in the diagnosis and treatment of speech, language, and swallowing disorders for children and adults and are licensed by the NC Board of Examiners for Audiology and Speech-Language Pathology. Some of them focus more narrowly on the habilitation of deaf and hard of hearing children or rehabilitation of adults with hearing loss, assisting them with listening for, and producing speech sounds.

Directories of licensed/certified hearing health care professionals are available through various sources, particularly that of the internet. Each of the hearing care professions has a professional association located in the state where information on available services may be gained through the respective web sites.

The above-referenced professionals specialize in treating hearing loss; they have obtained specialized training and credentials specific to treating hearing loss. Other professionals who merit attention are psychologists, social workers, counselors, primary care physicians, physician assistants and nurses. In general, these professionals are not trained specifically to work with people with hearing loss. Those who have received such specialized training, however, are few and far between. This fact is significant because it is widely but erroneously assumed that these professionals have the necessary expertise to

address hearing loss. These professionals' lack of basic education and training often has adverse ramifications, including failure to recognize the existence of hearing loss. As cited, the MarkeTrak VII survey concluded that only 12.9% of primary care physicians routinely screened for hearing loss during annual physical exams.<sup>23</sup>

## **B. Diagnosis of hearing loss:**

The diagnosis of hearing loss is a complex, multi-phased process that can extend over a lengthy period of time and involve a variety of professionals. For the older adult facing adult-onset hearing loss and who is just trying to come to terms with it, the diagnostic process can be overwhelming, intimidating and confusing. Encountering new terminology and a new world of unfamiliar technology often leaves the unprepared individual dazed.

Complicating matters further is the fact that the individual must first achieve a sufficient degree of acceptance of the hearing loss in order to begin the process of seeking and ultimately accepting formal diagnosis. Sergei Kochkin states that the average person with adult-onset hearing loss can wait as long as fifteen years before seeking assistance.<sup>24</sup>

To shorten the length of time between onset of hearing loss and final diagnosis, it would help for the general public to know the signs of hearing loss, that it is *not* part of the aging process and that resources are available. To shorten this gap even further, it would help for primary care physicians and general health care providers to be cognizant of the signs of hearing loss and to make inquiries about hearing loss a routine part of their patient assessment.

Before, during and after the diagnosis, the person with hearing loss invariably grapples with the range of emotions accompanying the grieving process. Anger, denial, bargaining, depression and finally acceptance are all part of this process. It is not uncommon for individuals to fluctuate back and forth between the different stages before fully accepting the hearing loss. Professionals may be needed to assist the individual through this journey. Some individuals wait until they have more concrete evidence of the hearing loss such as can be gained through a basic hearing screening, similar to what the Division offers, in non-threatening, comfortable and familiar environments such as senior centers before they seek formal diagnosis.

Once at the hearing care professional's office, the full evaluation can begin. However, the hearing care professional needs to be sensitive to the fact that at this point, the typical patient has already undergone a long and draining grieving process. This evaluation itself involves several complex steps in order to obtain a full "work-up" of the individual's hearing loss.

Not only is the diagnostic process complex but so is the treatment, and again, the patient must possess a sufficient degree of acceptance in order to ensure the success of diagnosis and treatment.

## **C. Treatment of hearing loss:**

Receiving treatment for adult-onset hearing loss can be an anxiety-provoking and confusing experience for many people. The effectiveness of treatment often is influenced by how well they are able to deal with their own grief at the loss of their hearing. Just as important is how well they accept and understand the information they receive about the treatment itself.

A common misconception is that hearing aids and cochlear implants address hearing loss the same way glasses address vision loss. Nothing could be further from the truth; they never truly regain the clarity of sound reception they possessed prior to their hearing loss. Very few people understand or accept this important fact. Much work remains for them to learn how to effectively "listen" using their new hearing instrument. They often do not realize that in many situations, such as at a theatrical performance, a church function or in a courtroom, they may need additional assistance in order to be able to hear well.

Much more than treatment is needed in order for older adults to live well with hearing loss. Many seniors, after having purchased hearing aids, experience dissatisfaction and frustration with them that they end up putting their hearing aids away in a drawer, never to use them again. To ensure the success of their new hearing instrument, they need accurate and unbiased information, basic counseling, skills development training, assistance in selecting appropriate assistive technology to supplement the hearing aid or cochlear implant and training in using technology effectively.

Further, the solutions for Deaf and Deaf-Blind seniors are very different from those who are Hard of Hearing and started losing their hearing in middle age. The expertise required to effectively serve Deaf, Hard of Hearing and Deaf-Blind people each is very unique from one another.

Below is a basic list of the types of treatment and supports often needed:

1. Hearing Aid Evaluation incorporates test results obtained during the initial evaluation, and sometimes a listening evaluation utilizing the recommended hearing aids, so that the patient and hearing aid dispenser can evaluate patient's potential outcome with hearing devices. If devices are deemed appropriate, ear impressions are made for the purpose of creating custom-made In the Ear hearing aids or earmolds/shells for Behind the Ear hearing aids.
2. Assistive Device Evaluation incorporates test results obtained during the initial evaluation to determine whether the patient would benefit from assistive technologies such as TV listening headsets, amplified telephones, alerting devices, etc. Devices are either ordered for the patient or can be applied for through the Division.
3. Once the patient has received his/her hearing aids, a minimum of a 30-day adjustment period should be granted, while the patient is learning to adapt to the hearing aids. (Preferably, the patient will receive a longer amount of time to ensure their satisfaction with devices.)
4. Patient should be seen for 2-3 follow-up visits per 30 days of adjustment time to review appropriate insertion/removal of devices, cleaning/care of the devices, appropriate expectations, etc. The patient's hearing outcomes are also reviewed during these sessions and adjustments are made to the hearing aids as indicated.
5. Some form of outcome measure should be used to document benefits of hearing devices (Self-reporting scale, aided testing in sound-field booth, etc.)
6. Communication tips/strategies should be reviewed with the patient and family members. This can be done on an individual basis, or in a group. This aural rehabilitation can also address the "hidden" impact of hearing loss on individuals and their families, by simulating hearing loss for the family members, discussing emotions related to hearing loss, and exploring positive ways of dealing with hearing loss. Counseling could be done on an individual basis with the individual and/or family members. This work could also be done by a speech pathologist, social worker, or counselor, but only if they are trained to do so. The vast majority of these professionals, however, either are not trained or do not have the time to provide such support.
7. Listening training should accompany the hearing aid fitting, for patients that are able to participate. This can be done utilizing live voice or a variety of computerized programs, one being "Listening and Communication Enhancement" (LACE). This type of training has been shown to provide improvements up to 40%, for understanding speech in the presence of background noise. This work could also be done by a trained speech pathologist.

#### **D. Physical accessibility of professionals**

Qualified professionals licensed to assist in the treatment of hearing loss are available in the majority of North Carolina counties. According to the North Carolina State Hearing Aid Dealers' and Fitters Board, there

are 545 licensed hearing aid dispensers in the state. However, how an individual may access services is a different issue. Some individuals with hearing loss may be referred to professionals by primary care physicians and others may be referred by "word of mouth". Some may be able to independently drive themselves to appointments, and others may have to depend on family or friends for transportation. Some individuals may live in assisted living facilities or nursing homes with limited transportation.

Like many other professionals in North Carolina, all hearing aid dispensers must secure proper licensure to practice. The licensing law for hearing aid fitters and dealers is contained in Chapter 93D of the North Carolina General Statutes. Likewise hearing aid dispensers are regulated by the North Carolina Administrative Code, 21 NCAC 22 as it applies to the North Carolina State Hearing Aid Dealers' and Fitter Board. This board issues all licenses and is the authoritative and enforcing body for all laws and rules applicable to hearing aid dispensers. The Board has established a Committee on Investigations which has the sole purpose of dealing with complaints about the dispensers.

This report would not be complete without the mention of internet purchase of hearing aids. These amplification devices, publicized as hearing aids, are available for purchase online and at a much lesser cost than traditional hearing aids. *Consumer Reports* states that although these devices amplify sound well, they caution against purchase and use.<sup>25</sup> Hearing aids must be properly fit and adjusted to the person's specific hearing loss. Internet purchase does not allow for this part of the fitting process. Nor does the internet purchasing system provide the one-on-one instructions for use. The full benefit in the use of hearing aids has been removed from the process.

In conclusion, the study of this area has revealed that professional services for hearing aid fitting are clearly available in North Carolina with exception of some of the more rural, low wealth counties of the state. The state also has a system in place to review and act on any substantiated complaint submitted by a consumer. The study also has shown that negative publicity based on public opinion and perception may play an important role in the lack of confidence and feelings of caution directed toward hearing aid dispensers.

However, the study showed an obvious lack of awareness and information of the process of obtaining a hearing aid. Other factors such as transportation, costs, fears, nursing home confinement and similar situations could be reasons why many of North Carolina's older adults do not seek hearing aid treatment.

Problematic situations with adverse impact on the consumer do occur and there exist problems within the system designed to protect the consumer. These need to be reviewed and improved. One example in need of review is the procedure involved when problems arise with the purchase of hearing aids via the internet. Though some regulations do exist for on-line purchasing, attention may need to focus on defining specific policies on hearing aids and similar devices as related to online sales and consumer protection. More and more, because of the rising costs of hearing aid technology, pre-conceived assumptions of the lack of confidence in the industry professionals, convenience or a combination of all of these, consumers are mistakenly seeking these on-line hearing aid sales options foregoing proper and sufficient hearing aid fitting for devices unsuitable to treat specific hearing loss needs. This results in further negative impact on consumers' opinions toward hearing loss treatment.

The large amount of negative public opinion and a lack of knowledge and education regarding hearing loss, hearing aid dispensers and realistic expectations in pursuit of treatment must be addressed to accentuate the positive work being done by many hearing aid dispensers in the state. Until that is done, hearing loss treatment, as a whole, will continue to be neglected and put off by too many people.

For fully effective treatment of hearing loss to take place, the understanding that the involvement of diverse and appropriately-trained professionals must occur. Proper hearing loss treatment is not a "one stop" shopping experience. Nor is it an over-night cure to better living or totally restored hearing. Proper hearing loss treatment involves a broad spectrum of treatment, education, and community support for both the individual with hearing loss and their families.



**Study Area 2: The availability and access to hearing aid purchase assistance programs for low-income individuals.**

Hearing aids costs are one of the most frequently cited reasons for a person to not seek the use and purchase of hearing aids. In his presentation to the Congressional Hearing Health Caucus, May 18, 2005, Sergei Kochkin stated that 2 out of 3 Americans with hearing loss, aged 55 and above, indicate affordability of hearing instruments as “somewhat” (17%) or “definitely a reason” (42%) for non-use of hearing aids.<sup>26</sup>

Hearing aid technology has improved greatly in recent years. The use of digital technology in most hearing aids manufactured has not only improved functionality of the hearing aid; it has caused costs of the instruments to rise significantly as well.

However, the technological advancement is not the only reason for rising costs. With the purchase of the devices, all related services of the dispenser normally are part of the package. Ensuring a proper fit can often be a tedious task because the technology involved often requires scientific methods for fitting and adjustments. But, because hearing aids are sold by professionals who sell, fit and perform the adjustments for the devices, pricing the hearing aids is open to a system fully dependent on the individual pricing of the dispenser. For that reason, the same hearing aid model could be found to have varying costs at different dispensing locations.

An article released by *Consumer Reports* in July 2009, following a two-year study, reports a huge variability in pricing. The study showed a mark-up price for hearing aids at an average of 117% above wholesale costs<sup>27</sup> but also ranging from 25% to 300%.<sup>28</sup>

*Consumer Reports* has issued the following pricing guide for each style of hearing aid. Costs listed are per unit:

Behind the Ear (BTE) Open Fit.....	Price: \$1,850 to \$2,700
Behind the Ear (BTE) with Earmold.....	Price: \$1,300 to \$2,750
In the Ear (ITE).....	Price: \$1,200 to \$2,700
In the Canal (ITC).....	Price: \$1,300 to \$2,750
Completely in the Canal (CIC).....	Price: \$1,365 to \$2,860 <sup>29</sup>

North Carolina residents purchasing hearing aids must bear the burden of the expense out-of-pocket. With the majority of patients needing a binaural fitting (2 hearing aids) costs then double. For some older adults, the choice then becomes whether to purchase needed medications, food or hearing aids.

Traditional Medicare does not provide coverage for hearing aids. Like private insurers, Medicare will pay for the doctor’s exam required for obtaining hearing aids. Medicare also pays for the hearing evaluation if prescribed by a physician. Individuals who have private Medicare Advantage plans have varied coverage and need to check with the plan administrator prior to purchase of hearing aids.

Private insurance companies rarely provide any coverage for hearing aids. North Carolina does not have a mandate for health care coverage for hearing aids. Currently, there are 15 states that have mandated hearing aid coverage. They are Colorado, Connecticut, Delaware, Kentucky, Louisiana, Maine, Maryland, Minnesota, Missouri, New Jersey, New Mexico, Oklahoma, Oregon, Rhode Island and Wisconsin. Rhode Island is the only state that provides a mandate for both children and adult coverage. All the others have coverage strictly for children. Wisconsin, the latest to join the list also mandates coverage not only for hearing aids but also for cochlear implants in children.<sup>30</sup>

Medicaid in North Carolina does not have an adult coverage for hearing aids. As of June 2009 thirty states in the United States and the District of Columbia provide Medicaid coverage for adults when obtaining hearing aids while 20 states do not. Those 20 states which include North Carolina are Alabama, Arizona, Arkansas, Colorado, Delaware, Georgia, Kentucky, Louisiana, Maine, Maryland,

Mississippi, Missouri, Oklahoma, Pennsylvania, South Carolina, Tennessee, Utah, Virginia and West Virginia.<sup>31</sup>

Hearing aid dispensers work with national financing organizations that will finance the purchase of hearing aids for credit worthy individuals. These programs act like loans at credit card rates in that the dispenser is paid in full and the customer is required to make monthly payments back to the financing company. Often, these plans have high interest rates. Division staff have reported seeing contracts made by some older adults with rates ranging from 20% to 30% APR.

For North Carolina older adults, there are a few programs that will assist in the purchase of hearing instruments. However, even though there are some programs providing assistance, the stringent eligibility requirements can make access difficult. State governmental agencies and community/civic non-profit agencies are the primary organizations providing assistance. There are a few national organizations that assist in the provision of hearing aids. Hearing aid assistance programs are listed below:

- 1) As of January 1, 2009 the Federal Employees Health Benefits (FEHB) provides coverage for hearing aids for adults. Older adults in North Carolina who have this coverage either as an active employee or as a retiree will receive a benefit of \$1000 per ear, every 3 years. FEHB has covered hearing aids for dependents since 2008.
- 2) The North Carolina State Employees' Health Plan, administered by Blue Cross/Blue Shield has 25% off hearing aid manufacturer's suggested retail price or \$250 off usual and customary fees, whichever provides greater savings under the Blue Extras/Audio Blue program.
- 3) The North Carolina Retired Governmental Employees' Association has as a member benefit called the "Hearing Discount Program." Contracted through HearPO, it provides for audiologist services and discounted hearing aid products and services through a network of over 3800 hearing clinics nationwide. Members and spouses may receive a free hearing screening as well as substantial discounts off suggested retail prices on hearing aids and batteries.
- 4) The Division of Services for the Deaf and the Hard of Hearing can provide to eligible persons one hearing aid. The hearing aid includes a required telecoil (explained in Study Area 3 section). The provision is made possible as part of the Equipment Distribution Service, a service available through the Telecommunications Resources Program of the Division. Eligibility criteria are 1) residency of the state, 2) certified hearing loss and 3) income cap not to exceed 250% of the national poverty level. Provision of the hearing aid is by application process. There is an approximate 8 weeks processing period for approval. Applicants may obtain an application from any of the Division's offices statewide and can get assistance in application completion, if needed, at these offices. Documentation to prove the above eligibility criteria is required with application. Applicants must also use one of the participating hearing aid dispensers contracted with the Division. Dispensers are located by region across the state. Funding for the program is made possible by the surcharge on wireless telephones enacted by the General Assembly (2003-341) G.S. 62-157 i.

The hearing aid distribution service is the only one of its kind in the United States because of the required telecoil element and the funding source from wireless communications. It has served as a model for other states attempting to develop their own hearing aid distribution programs. Since its inception in April of 2005, this service has provided hearing aids to over 10,000 North Carolinians. A major drawback of this service, however, is that it limits only one hearing aid per qualified applicant. Most people require two hearing aids in order to attain the hearing functioning they need.

- 5) The Division of Vocational Rehabilitation (VR) provides hearing aids to residents of the state meeting eligibility requirements. Hearing aids will be provided to individuals who are employable and need assistance at work or through the Independent Living Program. Income eligibility must be at national poverty level in order to qualify. A person must first apply with the Division of Services for the Deaf and

the Hard of Hearing and be denied before VR will determine eligibility. Independent Living funding levels fluctuate and waiting period is often around 9 months to a year depending upon the region of the state. Funding for the hearing aid provision is from federal sources.

6) The Division of Services for the Blind will provide hearing aids to people who have both vision impairment and hearing loss only when other sources have been exhausted.

7) The Lions Club International Foundation—The Lions Club Affordable Hearing Aid Project came into existence in 2004. Prior to this date, individual local Lions Clubs would work with area hearing aid dispensers to provide one hearing aid for an individual. The new program has contracted with a manufacturer of hearing aids to purchase them at two-thirds of the normal cost. The program will provide the hearing aid only to local clubs. The local club is responsible to pay all fees involved including the dispensing fee, batteries and other fees charged by the dispenser. Unless the local club has other requirements, an income cap of not more than 200% of the national poverty level determines eligibility unless. The local club has the option to choose to assist an individual.

Because of declining membership rosters and the current difficult economic times, most local clubs are not assisting individuals in this program. For those that do provide assistance, the number of individuals assisted is very low—approximately 1 or 2 per year.

8) Easter Seals operates a Durable Medical Equipment Program that can serve any person in the state, all ages and all disabilities. Eligibility requirements include 1) person must be disabled for a minimum period of 1 year; 2) person must not have Medicare, Medicaid, or private insurance that will cover all or a portion of the equipment; 3) person must reside in a private dwelling in North Carolina and not in a nursing home, rest home, home for the aged, a group home, etc. There is a waiting period of at least one and one-half (1 ½) years. Referrals are generally from audiologists as the program is not advertised.

9) The Hear Now Program of the Starkey Foundation will provide an individual with 2 hearing aids if needed. There is a \$100 per hearing aid non-refundable application fee. Eligibility is based on household income of not more than \$18,403 if single and \$24,675 for 2 person household. An applicant must not have any other sources available. In 2007, Hear Now provided 61 people in North Carolina with hearing aids. In 2008, the number of hearing aids provided to North Carolinians rose to 84. Because the Hear Now Program does not provide a reimbursement for dispensing fees to the vendor and restricts the hearing aid dispenser from charging any applicable fees for services (including dispensing fees) many dispensers opted out of the program long ago, making it difficult to find a dispenser cooperating with Hear Now.

10) The Sertoma Hearing Aid Recycling Program helps needy people obtain hearing aids. Clubs collect used hearing aids, have them refurbished and distribute them to people in need. In cases where an individual cannot afford to buy a hearing aid, a club can raise the needed funds to purchase the aid. Sertoma clubs likewise assist in the repair of hearing aids and in the provision of hearing aid batteries. Assistance is at the discretion of each club affiliate.

Regarding hearing aid adult coverage under Medicaid, the issue of coverage under the state Medicaid waiver programs was investigated. Based on information provided by the Division of Medical Assistance, the study group was notified that the Centers for Medicare and Medicaid Services (CMS) would consider approving hearing aids as an extended state plan service under a waiver such as the Community Alternatives Program for Disabled Adults (CAP/DA) if the state could establish that hearing aids help to prevent nursing home placement. To qualify for waiver services, a person has to meet nursing facility level care criteria. It was noted by staff that the bigger issue that would need to be addressed in considering coverage of hearing aids under a waiver program is that of identifying funding for state Medicaid match in light of the current budget crisis facing the state. It would be quite challenging to implement any program changes that would increase Medicaid expenditures in this current fiscal environment.

The study has shown that there are hearing aid assistance programs available to older adults in North Carolina. However, some of these programs are not very accessible. In fact, research shows that several are quite inaccessible and could be considered inactive. Financial restraints on agencies and non-profit organizations control the ability to assist needy older adults with hearing aid provision. Hear Now will provide the hearing aids but the application fee often is a burden for an older adult, particularly if two hearing aids (binaural) have been prescribed. Binaural fitting has the most beneficial effectiveness for hearing aid users.

As the study has made clear, more assistance methods and programs for hearing aid assistance must be creatively developed in order for low-income older adults in North Carolina to receive the hearing health care and treatment that they need. Increased hearing aid assistance for older adults would mean better quality of life and less physical and mental health issues resulting from hearing loss. The funds spent on hearing aid assistance could offset the costs that are now spent on treatment for health issues, and in time the state could likely recognize a savings in expenditures on health care.

The study area also has pointed out the significant need of hearing aid health insurance coverage for adults. Coverage could be either through Medicaid in order to assist the lower-income older adults who totally depend on Medicare/Medicaid as their primary health insurers or coverage from private insurance carriers to benefit the older adults of North Carolina who are retired and have health care coverage as a benefit to retirement.

***Study Area 3: The development of and inventory of adaptive technology options available to assist older adults with hearing loss.***

Adaptive technology comes in many different shapes and sizes. For the three distinct hearing loss populations (Deaf, Hard of Hearing, and Deaf-Blind), a variety of technology is needed for achieving effective communication. In a technological world, it is often difficult to keep up with the rapidly changing technology. For many, it can be a difficult choice in making a decision on the purchase of a television, a computer or other technological device so prominent in the lives of many. For the hearing loss population, difficulties are magnified as there is no easy solution in choosing which technology is best for the individual. Another added dimension to the difficulty is the range in costs found for specific equipment needed. Costs can range between averages of \$100 for a device known as a Pocketalker to as much as \$8,000 for a Deaf-Blind Communicator.

There are a number of factors to consider when choosing assistive/adaptive technology for older patients. Physical dexterity, cognitive health and common chronic conditions affecting use of extremities must be assessed before recommending equipment. For example, before dispensing a hearing aid, it is essential to assess dexterity of fingers, hands, wrists, sensitivity in the finger tips and the ability to raise the arms to the ears.

To develop an inventory of technologies available to assist the hearing loss populations would be one of exhaustive accomplishment. However, there is a multitude of varying technology in the market today that can allow a person with hearing loss enhanced functionality, independence as well as the feeling of connectivity in the world.

There are two basic categories of adaptive technologies reviewed for this study. They are hearing aid devices and assistive devices. Hearing aids tend to be the first method of treatment for hearing loss but it is important to realize other options may be a better solution. Treatment involves more than inserting a hearing aid in an individual's ear. Treatment involves major life changes: accommodations in lifestyles, learning the differences of sounds heard because of amplification, receiving counseling and consultation on equipment use, and adapting to a totally new perspective toward communication.

Because the development of an inventory for adaptive technology can be lengthy and because the nature of technological terminology can be confusing only equipment examples are listed within the context of this report.

Not many people would classify hearing aids as adaptive technology. However, it is perhaps the most popular of all technologies available and is the first form of technology used in treatment of hearing loss. Hearing aids come in different styles (noted on page 17). Because of the importance of the role of hearing aids as an accepted adaptive technological device, they are first examined.

## **A. Hearing aids and similar devices**

Audibility is the key concept underlying speech perception. In general, the more audible a speech signal is, the easier it can be understood. It appears the more speech sounds we hear, the better we understand. The following information gathered is upgraded options for hearing aids. These upgrades allow the hard of hearing person a validated hearing system that can be tailored to individual needs. When a hard of hearing person is being fitted monaurally then the hearing aid dispenser will choose options that will maximize understanding, clarity and comfort.

### Examples of Options available for Behind the Ear (BTE) and In the Ear (ITE) Digital hearing aids

- Automatic Volume Control
- Expert Assistant
- Multi-channel / Multi-Bands
- Multi-memory
- Directional microphones / Directional Speech Detector (DSD)
- Noise management / Noise Reduction with directional microphones
- Feedback management / Active Feedback Intercept (AFI)
- Programmable/automatic telecoils
- Remotes/FM Systems/Blue-tooth devices
- Verify Comfort

Of the list above, there are two significant devices that should be highlighted. The use of telecoils in hearing aids is significant in that they open the channels of telephone communication for the hearing aid user. A telecoil or t-switch or induction coil detects magnetic signals from the telephone and sends these signals to the hearing instrument for amplification. The induction coil can be programmable. The induction coil /telecoil allows the telephone and the hearing aid to become compatible and creates feedback free telephone use. It is also the most important technology device included in hearing aids needed for use with assistive listening systems and devices, induction loop systems and FM frequency systems.

The second from the list above is the use of directional microphones in hearing aids. Directional microphones pick up sounds from a narrow listening direction. Omni-directional microphones in hearing aids pick up sounds coming from all directions providing a more realistic environmental discretion in the sounds being heard. Directional microphones will also provide a safer sense of security to the user as sounds are better understood.

Though hearing aids are the traditional method of treatment, there is also the newer generation of technology available to people with hearing loss. These involve surgical implantation of electronic devices. The Bone Anchored Hearing Aid (BAHA) is one such device now available. A relatively simple surgical procedure anchors an abutment into the bone just behind the ear. Hearing is received through bone conduction of sounds fully eliminating the outer and middle parts of the ear.

## **B. Assistive devices**

The second part of the adaptive technology section presents a long inventory list of the different equipment available for use that can support a person in adaptation to unexpected life changes resulting from hearing loss. Assistive equipment can allow a person to maintain a high quality of life, to

continue to feel included in society and can provide a better sense of security. Below is a list of situations facing older adults with hearing loss and what assistive devices are appropriate. The list of equipment is not exhaustive due to the wide variety and availability of the technology.

### **How Can Older Hard of Hearing Adults *Communicate* with Hearing People?**

The people who are hard of hearing prefer to communicate with spoken language and speech-reading therefore use their residual hearing with hearing aids, personal communicators or surgically receive cochlear implants. In certain situations they may benefit from Hearing Assistive Technology (HAT) to overcome distance, noise and reverberation. Use of the following assistive devices will help remove barriers to communication which may be encountered:

- Personal Communicators
- Hearing Aids
- Bone Anchored Hearing Aid (BAHA)
- Cochlear Implants
- Computer Aided Real Time Captioning (CART)
- Computer Assisted Notetaking (CAN)

### **How Can Older Hard of Hearing Adults *Communicate* over the Telephone?**

Because Hard of Hearing individuals prefer spoken language for communication, continued use of the telephone remains a vital connection for them. A variety of telephones with special amplification and visual cues are available for use. Such devices include:

- Amplified, Hearing Aid Compatible Telephones
- Voice Carry Over Telephone
- CAPTEL—captioned telephone

### **How Can Older Hard of Hearing Adults *Participate* in Community or Educational Settings such as Senior Centers or Nutritional Sites?**

There are three types of Hearing Assistive Technology systems that could help in this situation: FM, InfraRed, and Audio Induction Loop. Each can cover small, medium and large meeting rooms. There are advantages and disadvantages of each system; the choice depends on how and where the system is used. Costs of the systems depend on the size of the room and number of receivers required.

### **How Can Older Adults with any Form of Hearing Loss Watch and Understand Television?**

Watching television for older adults with hearing loss can often be a painful experience for family and friends because of the raised volume blaring out of the television. With appropriate assistive technology, the Hard of Hearing individual no longer needs to increase volume to uncomfortable levels for others. Use of the same kinds of devices with similar technology as used in community settings will assist the individual in the understanding of the dialogue on the television. Such devices for use include:

- Personal FM System
- Infrared System
- Induction loop
- Closed Captioning
- TV Ears

### **How Can Older Adults with Any Hearing Loss be Safe in the Environment?**

Environmental safety is crucial in daily life. Those with hearing loss have a variety of devices to assist

in safety recognition. Deaf individuals use a various modes of communication including American Sign Language, speech reading and Cued Speech. A Deaf person, typically has a profound hearing loss and relies on a visual alert for notification. The following list present items that are examples of equipment that assists in eliminating barriers for people with varying degrees of hearing loss:

- Environmental Sounds
- Smoke and Carbon Monoxide Detectors
- Weather Alert Radios
- Personal Paging
- Vibrating Watches
- Shake Awake
- Smoke Detector with Strobe Light

### **How Can Late-Deafened Adults Communicate?**

While many adults who become deaf late in life may learn sign language and find it more comfortable than reading lips when in the company of other signers, most prefer to use their own voices when communicating. Today's technology provides a variety of choices in how they communicate.

- Assistive Listening Devices
  1. Personal Amplification
  2. FM Sound Systems
  3. Infra-red Sound Systems
  4. Audio Loop Systems
- Computer Aided Real Time Captioning (CART)
- Computer Assisted Notetaking (CAN)
- Cochlear Implants
- Hearing Aids
- Captioning
- Signaling Devices
- Two Communicators
- Voice Carry Over (VCO)
- Video Relay Services (VRS)
- VRS w/VCO
- IP Relay (Internet Relay)
- Wireless Devices (Pagers)
- TTY
- Video Phone (VP)
- Instant Messaging (IM)
- Text Messaging
- Captioned phone

### **How Can Deaf-Blind Adults Communicate?**

Deaf-Blind individuals have dual sensory loss meaning both vision impairment and hearing loss. Technological needs vary according to the individual's levels of loss. Some assistive equipment often needs to have greater specialization for accessibility. Assistive devices for those who are Deaf-Blind can include:

- Tellatouch
- Screen Braille Communicator
- Face to Face
- Deaf-Blind Communicator
- Braille Phone

Technology can be a good thing when used properly. As the study has shown, there is a diverse array of adaptive technology available for use by older adults with all types of hearing loss. Choice is simply a matter of obtaining the pertinent information, the benefits of its use and where to obtain the device. Features available in hearing aids, specifically those of the telecoil and directional microphones, need to be further considered as necessities for any hearing aid user. The benefits that these two features provide would literally open the doors of communication much wider for Hard of Hearing older adults.

The study has also shown that assistive equipment would be valuable to any place where older adults gather for social activities, programs, workshops and presentations where many of the attendees present would have hearing loss. However, the vast majority of people, including service professionals, are not aware of the wide variety of options available.

***Study Area 4: An assessment of the resources available in other states that are used to offset the problems associated with hearing loss in older adults.***

The Study Group focused on programs of interest located in other states assisting people who are Deaf, Hard of Hearing and Deaf-Blind. These included governmental agencies, non-profit organizations and consumer oriented groups. The study also included a look at national organizations providing similar services. This included Councils and/or Commissions for the Deaf and Hard of Hearing, Health and Human Services Agencies, Vocational Rehabilitation, Emergency Preparedness Agencies and Aging & Long Term Services Agencies. This study is not a detailed or comprehensive comparison between North Carolina and other states.

The following is a summary of relevant programs and services found in other states. A system of services in North Carolina has proven effective in delivering key services to different hearing loss populations, but service gaps exist. The resources below highlight services that North Carolina might learn from or want to emulate.

Arizona	One of two states with telecoil disclosure bill that mandate all audiologists and hearing aid dispensers educate and inform patients of telecoil technology and its benefits
	Uses various task forces to study hearing loss issues and keep community involved; such as Hard of Hearing Taskforce, Mental Health Roundtable, Deaf-Blind Taskforce, Hearing Aid Coalition, Quality Assurance of Programs and Services Taskforce
	Broadcasts weekly television show, "Community View." Beginning in 1974 as "Sign Out," it is the longest running weekly TV show specifically geared to Deaf and Hard of Hearing
	Adult Loss of Hearing Association-Arizona (ALOHA) is a non-profit group that offers support and advocacy and provides services for Deaf and Hard of Hearing adults
	Combined efforts with New Mexico to form Southwest Commissions for the Deaf and Hard of Hearing on projects emphasizing Native Americans with hearing loss and hearing aid consumer fraud.
California	Offers a service dog allowance of \$50 / month to low income individuals
	<i>Directory of Resources for Deaf and Hard of Hearing Services</i> developed by the California Office of Deaf Access –a comprehensive directory providing detailed contact information and many websites links to various public and private entities
	State employees receive health insurance coverage for hearing aids



Florida	Telecoil notification by hearing aid dispensers mandate
	Loan program for all types of assistive devices by the Florida Alliance for Assistive Devices
	Non-profit groups provide various services with costs based on a sliding scale
	Florida Independent Living Council that promote independent living opportunities for persons with disabilities throughout the state including consumer controlled direct service
	30-day trial period and hearing aid return mandate
Georgia	A combination of state appropriated funds and grants/donations from private foundations, businesses and individuals funds the Georgia Council for the Hearing Impaired
	Reliance on donations makes the funding system for the primary agency providing a variety of assistive services quite vulnerable during economic downturn
Illinois	Low interest loans with extended terms and flexible approval criteria provided by Illinois Assistive Technology Program for individuals to obtain assistive devices, services and home and vehicle modifications
	Telework provides individuals with disabilities low interest loans to start or improve home-based businesses
Kansas	Safety Communications Visor program—alerts law enforcement and emergency person to quickly identify drivers with communication barriers; distributed by Kansas Commission for the Deaf and the Hard of Hearing at \$5.00 cost per card  <i>*Note: The Division (DSDHH) does have a similar Driver Communication Card service in cooperation with the North Carolina State Highway Patrol. This program went into effect in June 2009 with the same purpose as described above. Visor cards are available to any Deaf or Hard of Hearing licensed driver through Division offices statewide and are at no cost to the driver. A wallet identification card is also available to all Deaf and Hard of Hearing in the state.</i>
	Funding is available on first come, first-serve basis to persons age 60 and older to assist with up to one-half the purchase price of assistive devices
Minnesota	Accessibility mandate for all state websites to include captioning for any and all video content
	45-day trial period for hearing aid and returns mandate
	All video campaign ads to include captioning for political candidates mandate
	Live captioning and new stadiums and convention centers mandate
	Maintains a toll free phone number and website for consumer information
	Consumer rights brochure regarding hearing aid protection developed for distribution with emphasis on older adults
Nebraska	A public / private partnership hearing aid bank—provides hearing aids to low income individuals—involves collaboration between the state agency, the University of Nebraska Medical College and the Lions and Sertoma civic organizations

New Mexico	State agency web site has direct link to Aging and Long Term Services
	Small mini-grant fund encourages service providers of non-profit agencies and organizations to pursue projects to meet identified long-term goals to improve communication access—provided by New Mexico Commission for Deaf and Hard of Hearing Persons
	Health care coverage for hearing aids for children mandate
	Combined efforts with Arizona to form Southwest Commissions for the Deaf and Hard of Hearing on projects emphasizing Native Americans with hearing loss and hearing aid consumer fraud.
Rhode Island	One stop Deaf and Hard of Hearing Resource Center provides a variety of services to include educational trainings and sessions on leadership and empowerment of consumers—fully accessible for effective communication
	Development of nursing home fully accessible for the Deaf and the Hard of Hearing and is deaf-friendly environment—visual communication, staff fluent or trained in sign language and is knowledgeable of a variety of service supports to the hearing loss populations
	Only state with health insurance mandate for hearing aid coverage for all ages
	Enhanced advocacy efforts to ensure announcements at public places are visible to Deaf and Hard of Hearing people—state government, medical service providers, hospitals for examples
	Convenes key state, private and non-profit stakeholders for dialogue on issues faced by people with hearing loss, reports to state agency to research and document issues and discussion
Texas	Senior Citizens program geared toward bridging communication barriers and reducing the isolation faced by Deaf and Hard of Hearing people 60 or older—part of services for the Department of Assistive and Rehabilitation Services
	Coping skills training, independent living and recreational activities part of services provided

### Several States

In at least 9 states, there are specialized retirement communities and nursing homes for Deaf seniors whose primary language is American Sign Language (ASL). These facilities have trained staff that are fluent in ASL and possess in-depth knowledge about the unique needs of Deaf seniors and effective ways to support them. Some of these facilities also provide hospice care for this population. These facilities are found to be extremely effective in fostering a fully-accessible environment where there is active daily peer interaction and consistently appropriate support from the staff. There is an organization called Deaf Senior Housing that specifically seeks to develop retirement communities in the United States. North Carolina currently does not have such a facility. However, the NC Association of the Deaf and the Deaf Seniors of North Carolina are actively pursuing the possibility of establishing this resource for Deaf seniors in North Carolina. The states that do have such facilities are: Arizona, California, Florida, Georgia, Massachusetts, New Jersey, Ohio, Texas and Wisconsin.<sup>32</sup>

After reviewing nearly all the websites for the individual states, it became very clear the emphasis is placed on use of the internet. At each web site, the importance of having a comprehensive, one-stop website is obvious. Audiology On-line offers free videos/classes in nearly all aspects of hearing loss. Although geared towards audiologists and their requirements for continuing education units, the on-line videos are watched by many individuals with hearing loss trying to understand their own disability. Many videos on hearing loss are also available for free on "YouTube. A search at the You-Tube website had 9,000 videos for the search term "hearing loss." At the top of the list is a video "Top Tips for Engaging the Elderly" and a PBS video on hearing loss narrated by Vinton Serf, Google's Internet Guru who is also a hearing aid user.

Several states' websites did have videos imbedded into their sites with added captions and ASL. No states however, had any type of programs to educate on the use of internet or programs to offer free or reduced internet access. The South Carolina Council on Aging website had a link to a report that stated the fastest growing internet users are ages 70 to 75. The Pew Internet & American Life Project found that 78% of 50 to 59 year olds, 60% of 60 to 69 year olds, 45% of 70 to 75 year olds, and 27% of 76 plus use the internet on a regular basis. Fully 75% of internet users age 64 and older send and receive email, making email the most popular online activity for the age group. Instant messaging, social networking, and blogging have gained significant ground as important communication tools.<sup>33</sup> The internet is capable of putting all people with hearing loss on equal basis with everyone else.

In addition to the use of the internet for educational and social networking, there is also increasing use of this medium for mental health counseling for the Deaf. An abstract of an article presented in the *Journal of Deaf Studies and Deaf Education*, April 27, 2009, on the use of Telehealth states:

*Within the deaf population, an extreme mental health professional shortage exists that may be alleviated with videoconferencing technology—also known as telehealth. Moreover, much needed mental health education within the deaf population remains largely inaccessible. Researchers have warned that the deaf population may remain **underserved** if significant changes do not take place with traditional service delivery methods. This article evaluated the efficacy of telehealth in teaching psycho educational objectives, with special emphasis given to its application to the deaf population. Results indicate that telehealth can be regarded as an efficacious and cost-effective option in delivering health care to the deaf population. Participants also indicated satisfaction with the telehealth technology.*<sup>34</sup>

Along the same line as telehealth for mental health counseling, recent articles on audiologic rehabilitation (AR) also identify the benefits of using the internet to enhance AR's potential. It is also being reported that cognitive compromises and psychoacoustic auditory processing disorders associated with aging may contribute to communication difficulties in this population. This makes the importance of AR for the older hearing aid user an important consideration.

Part of AR strategy involves using support groups. The explosion of electronic hearing loss support groups on the internet allows for an important alternative to traditional support groups when travel, distance, and schedules limit the availability of the face-to-face traditional group. Most laptop computers now include a small video camera for video chatting on the internet. Use of this option will also allow verbal communication within the on-line AR support group.

In the future, more older adults will be increasingly diverse in needs and aging in place. Programs and services will be adjusted to be consumer directed; internet use by older adults will continue to grow and will be an important communication tool for hearing loss populations.

North Carolina's population will become more diverse in the future. Very few states offer services specific to hearing loss issues in older adults. Only one, Texas, has a senior program. States that are similar or larger than North Carolina have more non-profit groups operating within the hearing loss community. Several states utilize non-profits to operate some of their mandated/required services to the Deaf and Hard of Hearing.

## **Recommendations for Consideration**

The intent of this study is to provide answers to key questions that assist members of the Study Commission and the General Assembly in understanding the problems and barriers experienced by older North Carolinians with hearing loss and the resources available and needed. The study makes clear several important points: 1) hearing loss is widespread among older adults and, left unaddressed, could have profound and devastating impact on their health and functioning, 2) hearing loss is highly varied, complex and very little understood, even among professionals such as physicians, psychologists and social workers, and 3) effective communication is the key to an individual's ability to develop and

maintain healthy social connections and to independently access and use the services and resources in their own communities.

Throughout the study, one recurring issue surfaced: the lack of awareness and understanding regarding hearing loss among individuals with hearing loss, their families and the agencies that serve them. This lack of awareness and understanding not only directly impacts the individuals themselves it also impacts the ability of entities in the public and private sectors to make their resources fully accessible to them.

In North Carolina, there is a network of specialists, including Ear, Nose and Throat physicians and audiologists, and hearing aid dispensers. However, as the study demonstrates, there is a need for significantly more intervention beyond what is provided by these professionals: the need of older adults with hearing loss to effectively access and utilize all the resources in the communities where they live.

This need is what the Division of Services for the Deaf and the Hard of Hearing currently is charged with addressing through its seven regional centers and through technology. The penetration of serving this need, however, continues to be very small due to the disparity between limited staff resources and a rapidly growing hearing loss population.

Therefore, emphasis should be placed on increasing the awareness and understanding of hearing loss among all North Carolinians and in all sectors of North Carolina society.

Based on the results of the study, the Division of Services for the Deaf and the Hard of Hearing places before the North Carolina Study Commission on Aging and the North Carolina General Assembly the following recommendations for due consideration.

**Recommendation 1:** *It is recommended that the General Assembly of North Carolina establish a task force to assess the feasibility of developing and implementing a formal system that optimizes consumer capacity to evaluate quality of hearing aid services prior to and during the process of purchasing hearing aids. The task force should comprise representation from at least each of the following entities: 1) The North Carolina Speech, Hearing and Language Association; 2) The North Carolina Board of Examiners for Speech and Language Pathologists and Audiologists; 3) The North Carolina Association of Hearing Care Professionals; 4) The North Carolina State Hearing Aid Dealers and Fitters Board; 5) the North Carolina Division of Services for the Deaf and the Hard of Hearing; 6) The Attorney General's Office; 7) the North Carolina Division of Aging and Adult Services; and 8) the Hearing Loss Association of North Carolina. As the delegated authority in accordance to G.S. 93D and 21 NCAC 22, the Hearing Aid Dealers and Fitters Board, the Division suggests the Board be the lead entity in this venture. Finally, resources would be made available to assist in fulfilling this mandate within one year of enactment.*

The objective to this recommendation is to establish a system that can be used as a tool to assist customers in a greater level of confidence to ease tensions and anxieties, promoting awareness, developing reassurance of professionalism and making informed decisions associated with hearing aid fitting. One of the areas of study designated by the General Assembly was the availability of qualified professional services for diagnosis and treatment of hearing loss. The study group reviewed the various professions and the treatment of hearing loss through the fitting of hearing aids. As pointed out, this came out of expressed concerns and feedback from the general public having personally experienced problematic situations with some hearing aid dispensers.

This study found that there are a large number of highly skilled and highly qualified hearing aid dispensers in the state. Likewise, it found that the majority of hearing aid dealers exhibit high levels of excellent customer service. Therefore, the conclusion was made that, due to the lack of awareness of the public toward hearing aid fitting and the expectations, public opinion of hearing aid dealers has been skewed by actions of a small number of hearing aid dispensers. The unsure and often confused

Hard of Hearing consumer should feel confident when seeking assistance in the treatment of hearing loss. With a system in place that provides this immediate reassurance to the consumer, the hearing aid fitting process can be approached with the confidence and knowledge needed for successful treatment. The ultimate beneficiaries would be the customers themselves.

**Recommendation 2**—*It is recommended that the General Assembly enact legislation that would mandate a minimum of a 30-day trial period for hearing aids and instruction in the function and use of telecoil technology in hearing aids. This will promote awareness and best practices in the treatment and rehabilitation of hearing loss through hearing aid use and to ensure consumer protection during the purchasing of hearing aids. It is further recommended the General Assembly require the NC State Hearing Aid Dealers and Fitters Board to adopt rules that require dispensers provide to the buyer written notice of the trial period and money-back guarantee which would permit cancellation of the purchase of the hearing aid within the first 30 days of fitting and an informational brochure which explains the many benefits of telecoil technology.*

This also is a consumer protection issue only where a number of people, particularly older adults, find themselves experiencing difficulties. For a customer who is not aware of standard practices of hearing aid dispensers, they can become very confused by the process. Without sufficient orientation on the part of the dispenser, there can often be situations of total misunderstanding, with disastrous ramifications for the customer. A majority of hearing aid dispensers are excellent in providing a 30 day trial period as a sign of good customer service. However, holdback fees also can be charged for services if the hearing aid is returned. The consumer has the right to know about these fees in advance, particularly if they responded to a promotion of a “free hearing test.” For the older adult who has finally acted and sought treatment for his/her hearing loss, a negative event such as surprise charges can often stimulate a response that will keep the hearing loss untreated.

Significant to hearing aid technology is the inclusion of the telecoil. This technology enables Hard of Hearing and some times Deaf users easy access to sounds from telephone equipment as well as a number of other electronic audio equipment, including radios, public address systems and assistive listening devices and systems in movie theaters. Telecoils allow hearing aid users to talk on the telephone without feedback and interference of static sounds from their hearing aids. Most users, especially new hearing aid users fail to inquire about telecoils simply due to lack of knowledge of the technology.

Hearing aids technology has now evolved to programmable automatic telecoil response so that dexterity issues for older adults should not interfere with the telecoil use. In the past the telecoil was manually activated and some seniors could not-successfully use this feature. Now, automatic telecoil response technology has removed these potentially limiting problems for the older adult.

**Recommendation 3**—*It is recommended that the General Assembly consider legislation requiring hearing aid health insurance coverage for all ages from any private agency providing health insurance and doing business in North Carolina and from any public agency providing medical insurance coverage assistance. Coverage for private insurers would include a \$1,500 per ear benefit at a scheduled rate of every 5 years. Coverage for public insurances would follow specified benefit schedules as developed within the administrative agency policies.*

Hearing aids are expensive and technology improves rapidly causing costs to rise often. As costs are a leading reason for a person not to pursue treatment of hearing aids, coverage by health insurance companies would lessen the number of people who go without treatment. The report has shown a direct link to untreated hearing loss and poor health, poor performance at work, lower incomes earned and mental health related issues. At present, health benefits plans rarely include coverage for hearing aids so that consumers pay for hearing aids as an out-of-pocket expense.

Coverage of hearing aids by health benefits providers should allow people with hearing loss,

regardless of age, to realize the potential benefits from appropriate amplification that is properly fit, adjusted, and used as part of a comprehensive intervention plan. Coverage should also recognize the need for replacement of hearing aids due to maturation, change in hearing ability, normal wear and tear, and technological advances that better meet a user's communication needs. If the policy does not cover the entire cost of the hearing aid, the consumer should have the option to select the hearing aid of choice by paying the difference between the market price of the hearing aid and the maximum benefit allowed.

The State of Maryland Health Care Commission commissioned a study conducted by William M. Mercer, Inc. Mercer estimates the average annual cost per member at \$7.88 and the annual cost per contract at \$16.54 on 2.1 members per contract. The estimated annual per employee costs for group policies was \$17.00. It is interesting to note that insurance carrier survey responses ranged from no impact to a 0.5% increase in premium. Overall, the carriers projected a 0.3% increase in premium.<sup>35</sup>

Many older adults in North Carolina do not have access to health insurance coverage through private agencies. Because of the dependency on public insurances like Medicare and Medicaid, many older adults often do not receive similar coverage and benefits that peers with private health insurance do. Though health issues are the same as their peers, Medicaid eligible older adults often find themselves unable to get needed treatment because of restrictions in coverage within the Medicaid policies.

This study has shown that hearing loss in older adults is a contributing factor to poorer health, particularly to those old adults of lower income. It must be recognized that the health needs of these older adults must be approached in a broader sense of definition that would also include treatment for hearing loss, particularly in hearing aid provision.

Research has shown a greater percentage of older adults using hearing aids have healthier, more active lifestyles than those that do not use hearing aids. It can be assumed that with a greater percentage of older adults experiencing better health as a result of hearing aid use, the medical costs within the Medicaid program could decrease, particularly in costs associated with mental health.

## **National and State Level Initiatives**

In the United States, there have been few significant initiatives related to hearing loss and its impact on older adults. In 2006, during the American Public Health Association annual conference, Howard J. Hoffman of the National Institute on Deafness and Communicative Disorders reported that "although hearing loss increases greatly with age and economic costs of severe-to-profound hearing loss exceed \$6.7 billion annually, only limited national data on prevalence of hearing loss and rehabilitation devices exist."<sup>36</sup>

Nationally, there are two initiatives of significance that demand mention. First, in 1999 the National Council on Aging released findings on a study which they had commissioned on "The Consequences of Untreated Hearing Loss in Older Persons." This study was conducted by Seniors Research Group utilizing the National Family Opinion Panel. The report revealed a direct link of untreated hearing loss to "serious emotional and social consequences for older persons."<sup>37</sup>

The second notable initiative on the national front is currently the Hearing Aid Tax Credit Bill (HR 1646 / S 1019) in the United States Congress. A tax credit bill has been introduced in Congress for several sessions but has stalled each year. This particular version of the bill was reintroduced in the House of Representative in March 2009 and the Senate version in May 2009. The two separate bills are similar in that, if enacted, the bill would provide for a \$500 tax credit per hearing aid every five years. The two bills differ on the ages covered (Senate version covers all ages, dependent children and all adults, while the House version only covers dependent children and adults aged 55 up) and the inclusion of an income cap of \$200,000 yearly income in the House bill while the Senate Bill has no cap.<sup>38</sup> Enactment by Congress, whichever version is adopted, would provide a form of hearing aid purchase

assistance for older adults who file tax returns. It would not benefit the large population of older adults who are exempt from filing tax returns.

North Carolina has made a few important strides in legislation and initiatives that benefit citizens with hearing loss. Passage of S.L. 2008-181, HB 2431, Section 12, "The Studies Act of 2008" by the General Assembly marks the first time an authorized study of this magnitude was ordered from a high level of state government.

During the 2009 session of the General Assembly, introduction of HB 589 and S 375 denotes another significant action taken by the Legislature. This legislation mandates health insurance coverage of hearing aids for children. Wide-spread support was shown by legislators of both houses.

In 1989, enactment of G.S. 143B-216.31 restructured and renamed the original Council for the Hearing Impaired to The Council for the Deaf and the Hard of Hearing and G.S.143B-216.33 created the Division of Services for the Deaf and the Hard of Hearing as a part of the Department of Health and Human Services. The creation of these two entities was an important acknowledgement to the Deaf, the Hard of Hearing and the Deaf-Blind populations, their families and the communities of North Carolina and ensured access to communication and human services which are provided to all individuals in the community.

The Division, by the authority of the Department of Health and Human Services in accordance to G.S. 62-157 is likewise charged with the responsibility to administer the Telecommunications Relay Service. Both General Statutes ensure that every person who is Deaf, Hard of Hearing, Deaf-Blind or Deaf with other disabilities in the State of North Carolina can have equal access, effective communication leading to a better quality of life. In 2003, the General Assembly enacted S.L. 2003-341, "Extend Surcharge to TRS Wireless Connections." This legislation was groundbreaking and has provided means to increase equipment distribution and services to citizens with hearing loss. This legislation also serves as a model to other states seeking similar legislation.

## **Concluding Statements**

This study places before the citizens of North Carolina the challenge to comprehend the often devastating impact of hearing loss on individuals and their families. It also challenges us to understand the positive possibilities associated with hearing aid usage, assistive technology usage, and communication access. Individuals who deny having hearing loss, physicians, medical centers, health care facilities, skilled care facilities, general associations—all, need help to understand what the ramifications of hearing loss are. The study also shows that proper access to communication through appropriate means is a contributing factor to the successful resolution of many medical, emotional, social, and psychological conditions in older adults.

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