Audiology Services in the Schools

Prepared for the Center on Personnel Studies in Special Education

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INTRODUCTION

The American Speech-Language-Hearing Association (ASHA) is the professional, scientific, and credentialing association for more than 109,000 audiologists, speech-language pathologists, and speech, language, and hearing scientists. ASHA's mission is to ensure that all people with speech, language, and hearing disorders have access to quality services to help them communicate more effectively.

ASHA and its members advocate for and serve the needs of approximately 28 million Americans who have hearing loss. Many of these are children who receive audiology services in the schools. *Educational audiologists* providing services in and for schools typically have extensive experience with pediatric populations and comprehensive knowledge of the effects that hearing loss and (central) auditory processing disorders [(C)APDs] can have on communication, academic performance, and psychosocial development. Educational audiologists also have a unique understanding of legislation related to audiology service provision to children (birth to 21 years) and the processes of state education agencies (SEAs) and local education agencies (LEAs). This paper will address issues related to professional preparation, certification/licensure, and supply/demand that are of critical importance to audiologists and the children, SEAs, and LEAs they serve.

PROFESSIONAL PREPARATION FOR AUDIOLOGISTS IN THE SCHOOLS

Changes in Professional Preparation in Audiology

Audiology services in the schools are affected by changes in the field of audiology since the late 1990s. Audiologists recognized that in the 21st century there would be a greater need for academic and clinical training: (a) to keep up with advancements in knowledge, techniques, and technology in audiology and (b) to ensure provision of the highest quality service to consumers. To broaden the knowledge base of audiologists and facilitate high-quality service provision changes to audiology, preservice training and certification requirements are being instituted.

Transition to the Doctorate

Recognizing the need for audiologists to acquire advanced post-baccalaureate study that emphasizes clinical practice, the audiology profession worked to develop and implement a specialized doctoral program of study. Before January 1, 2001, it was the responsibility of ASHA's Council on Professional Standards in Speech-Language Pathology and Audiology (Standards Council) to develop and monitor standards for clinical certification in the context of changes in the scope of practice of the professions. The Standards Council developed an action plan to identify the "...academic, clinical practicum and other requirements for the acquisition of critical knowledge and skills necessary for entry-level, independent practice of audiology" (ASHA, n.d. - b). As a part of that plan, the Educational Testing Service was commissioned by ASHA to conduct a skills validation study for the profession of audiology. Following a review of the data provided by the skills validation study, practice-specific literature, feasibility studies, and other pertinent information, in October 1996, the Standards Council published proposed standards for widespread peer review. The document with significant modifications was then released for a second round of peer review in July, 1997. Additionally, ASHA commissioned an independent research firm to conduct a telephone poll of academic programs to gather information from 124 academic program chairpersons. Responses were obtained from 91 programs with this technique. Modifications to the proposed standards were based on the second round of peer review, adopted by the Standards Council at its meeting in September, 1997, and are to be implemented in 2007.

The 1997 Standards for the Certificate of Clinical Competence in Audiology are intended to make the scope and level of professional education in audiology consistent with the scope of practice of the profession. They address the significant discrepancies between the level of preparation and requirements for practice that were identified in the skills validation study.

The new standards include these salient features:

- Applicants for the certificate of clinical competence must complete a minimum of 75 semester credit hours of post-baccalaureate study that culminates in a doctoral or other recognized academic degree. The increased credit hour requirement is consistent with the increase in knowledge and skills required to support the change of the scope of practice of audiologists that has occurred since the 30-unit requirement was adopted in 1988. The requirement of 75 credit hours may be met by credits

awarded by the academic institution for formal courses, laboratories, and practicum experience.

- The requirement for 75 post-baccalaureate semester credit hours becomes effective for persons who apply for certification after December 31, 2006. The requirement for a doctoral degree is mandated for persons who apply for certification after December 31, 2011.

- Graduate education in audiology must be initiated and completed in a program accredited by AHSA's Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA).

- The program of study must include a practicum experience that is equivalent to a minimum of 12 months of full-time, supervised experience.

- The standards do not stipulate the specific courses or practicum experiences required. The applicant must demonstrate that the acquisition of knowledge and skills was assessed by the educational program that grants the post-baccalaureate degree.

- The standards include maintenance of certification requirements (Standard VI) that went into effect on January 1, 2003. Requirements for maintenance of certification can be met through a variety of professional development activities or academic course work (ASHA, 2001b).

The profession is in a time of transition. Not only is ASHA requiring a doctorate, the American Academy of Audiology (AAA) also has doctoral-level requirements for certification (AAA, n.d.). Audiologists in all practice settings are evaluating whether or not they will obtain a doctoral degree, and individuals entering or currently enrolled in training programs are evaluating their doctoral degree options in order to meet certification requirements. When the new standards go into effect, audiologists holding ASHA certification will not be required to obtain a doctoral degree as long as their certification remains current. To facilitate the acquisition of doctoral degrees, especially the clinical Doctor of Audiology (AuD) degree, distance-learning programs have been established to meet the academic and clinical needs for practicing audiologists. Once a significant number of universities have audiology doctoral programs in place, distance-learning programs may be phased out.

In addition to establishing the new audiology doctoral programs, academic programs are phasing out their masters programs in audiology. Some universities are ready to bring new students into doctoral programs, whereas others have not been able to meet doctoral degree standards or are unable to obtain university funding to move to the doctorate.

Necessity of Continuing Education

Standard VI requires audiologists wishing to maintain their ASHA Certificate of Clinical Competence in Audiology (CCC-A) to obtain and document continuing professional development. This mandate began on January 1, 2003, and will be phased in according to initial certification dates. The renewal period will be three years. This standard will apply to all certificate holders, regardless of the date of initial certification (ASHA, 2001b). For audiologists with masters degrees who already possess their ASHA CCC-A, continuing education is essential

to continue practicing audiology and to have a certificate that is portable across work sites and state boundaries. For audiologists who have obtained their doctorate through distance-learning programs or the newly established on-campus doctoral programs, continuing education is essential as they continually improve their knowledge and practical skills.

According to Standard VI, professional development is defined as "any activity that relates to the science of and contemporary practice in audiology, speech-language pathology, or speech, language, and hearing sciences, and results in the acquisition of new knowledge and skills or the enhancement of current knowledge and skills. Professional development activities should be planned in advance and based on an assessment of knowledge, skills, and competencies of the individual and/or an assessment of knowledge, skills, and competencies required for the independent practice of any area of the professions" (ASHA, 2001b). Audiologists may demonstrate continued professional development through one or more of the following options:

- "Accumulation of 3 continuing education units (CEUs) [30 contact hours] from continuing education (CE) providers approved by ASHA. ASHA CEUs may be earned through group activities (e.g., workshops, conferences), independent study (e.g., course development, research projects, internships, attendance at educational programs offered by non-ASHA CE providers), and self-study (e.g., videotapes, audiotapes, journals); or

- Accumulation of 3 CEUs (30 contact hours) from a provider authorized by the International Association for Continuing Education and Training (IACET); or

- Accumulation of 2 semester hours (3 quarter hours) from a college or university that holds regional accreditation or accreditation from an equivalent nationally recognized or governmental accreditation authority; or

- Accumulation of 30 contact hours from employer-sponsored in-service or other continuing education activities that contribute to professional development" (ASHA, 2001b).

Impact of Changes in Audiology Standards

The long-term impact of the changing standards on the profession of audiology and audiology in the schools is unknown. Ultimately, audiologists will continue to broaden their knowledge base and have more extensive preservice training. Specifically, the two major areas that will have an impact on audiology services in and for the schools are: (a) financing and (b) knowledge.

Financial impact. One of the basic tenets of advocates for the AuD and other doctoral-level degrees is that audiologists who possess a doctorate can expect to see salary improvements. For audiologists practicing in school settings, this may actually be realized, because many salary schedules in educational settings are based on academic degree. Individuals with various advanced degrees (e.g., masters, education specialist, doctorate) frequently start out on progressively higher salary schedules. In addition, most educators are able to better themselves financially by obtaining advanced degrees after being hired by an LEA. It is anticipated that audiologists with masters degrees who are currently practicing in the schools will move into higher salary schedules if they obtain doctorates.

On the other hand, the increased salary demands of doctoral-level audiologists may decrease the number of audiologists directly employed by LEAs and increase the use of audiology support personnel, e.g., technicians, in order to balance the budget of LEAs that employ audiologists. For LEAs that contract with audiologists in private practice, hospital, clinical, or university settings, the cost of obtaining equivalent contracted services will increase. In addition, the CCC-A will have increased importance to LEAs as they seek to bill Medicaid and other third-party insurers for audiology services, as third-party payers often require the use of ASHA-certified providers.

Knowledge impact. The audiology doctorate will broaden the knowledge base and the clinical skills of audiologists. Traditional masters degree programs in audiology are sometimes able to provide the knowledge base and practicum experience necessary for success in audiology practice in schools. The audiology doctorate can meet the needs of audiologists providing services in the schools if one or more of the components of the doctoral program focuses on audiology practice issues specific to educational settings. It is critical that advocates for and experts in audiology service provision in the schools participate in the development of audiology doctoral programs. This can assure that course work and clinical experience are relevant to pediatric populations and educational settings. The next few years will be a golden opportunity to shape audiology doctoral programs to meet the needs of LEA-based practitioners as well as those providing services for LEAs.

The need for continuing education will also affect audiologists in the schools. Educators have traditionally used academic course work at the graduate level as a way to enhance their knowledge base and improve their salaries. Although graduate credit classes can meet the continuing education requirements of ASHA if they result "in the acquisition of new knowledge and skills or the enhancement of current knowledge and skills" in audiology or related communication sciences (ASHA, 2001b), other activities can also be used to meet the continuing education requirement. LEAs will need to provide: (a) graduate courses or continuing professional development programs that are relevant to the practice of audiology or (b) adequate release time and financial support for their audiologists to obtain necessary continuing education through other mechanisms outside of the school setting. Some LEAs may already have these two options in place; others will need to establish them.

The importance of ASHA's CCC-A will increase as LEAs strive to meet the Individuals with Disabilities Education Act (IDEA) qualified provider provisions (IDEA, 1997). The preservice and continuing professional development requirements attached to acquiring and maintaining the CCC-A will ensure that audiologists have current knowledge about and skill in the practice of audiology.

PROFESSIONAL PREPARATION NEEDS OF AUDIOLOGY PRACTITIONERS IN THE SCHOOLS

New Standards

Various professional organizations have helped define the role of the audiologist in the schools. Most recently, *Guidelines for Audiology Service Provision in and for Schools* (ASHA, 2002b) have provided information about the legal mandates and the critical components of audiology service delivery in the schools. The document highlights the need for audiologists to provide audiologic assessment, audiologic (re)habilitation, education management, education training, counseling, classroom acoustics measurements and recommendations, and integration with early hearing detection programs. The Educational Audiology Association (EAA) developed *Minimum Competencies for Educational Audiologists* (EAA, 1994) that describes the knowledge necessary for practitioners to work in the school setting. Preservice competencies (e.g., service delivery models, overviews of educational theory of curriculum and instruction, speech and language acquisition, and the psychological aspects of hearing loss in children and its impact on the family) are included in the EAA document. The Recommended Professional Practices for Educational Audiology (EAA, 1997) also describes skills that the competent school practitioner needs in the areas of identification and assessment, amplification, hearing loss management, conservation and consultation, program management, and professional leadership and development.

ASHA's new Audiology Standards address knowledge, skills, and attitudes pertinent to educational audiology practice. Clearly, the intent of the new Audiology Standards is to prepare audiologists to provide competent, comprehensive services in all settings, including school-based audiology programs. For example, Standard III requires that "students shall participate in practicum only after it has been determined that they have had sufficient preparation to qualify for such experience. A variety of clinical practicum experiences must be obtained so that the applicant can demonstrate skills across the scope of practice in audiology" (ASHA, 1997, p. 7). Standard III also describes the program of graduate study that must be completed for ASHA certification. The program requires at least 75 semester hours of "academic course work and a minimum of 12 months' full-time equivalent (FTE) of supervised clinical practicum sufficient in depth and breadth to achieve the knowledge and skills outcomes stipulated in Standard IV" (p. 7).

Standard IV describes the knowledge and skills outcomes necessary for certification in audiology. Standard IV provides advocates for audiology services in the schools an unprecedented opportunity to shape the doctoral course of study to meet the needs of school practitioners and meet the requirements of IDEA. It describes the areas of knowledge that the doctoral audiology student must master: skills and foundations of practice, prevention and identification, evaluation, and treatment. Standard IV also provides many opportunities for issues related to audiology services in the schools to be infused into the curriculum. For instance, it mandates the necessity for the student to have knowledge about "educational, vocational, and social and psychological effects of hearing impairment and their impact on the development of a treatment program" (p. 8). It also requires that the student be able to "interact effectively with patients, families, other appropriate individuals, and professionals" (p. 8). Finally, Standard IV

mandates the need to "develop culturally sensitive and age-appropriate management strategies" (p. 8).

What Needs to Be Done

The impetus for the audiology doctorate sprang from the needs of audiologists working in private practice and hospital settings to have increased autonomy and an expanded knowledge base. Indeed, the vast majority of audiologists are employed in hospitals or private practice settings (ASHA, 2001c). Audiology services in the schools have always been provided by a relatively small number of audiologists. As audiology doctorate programs are developed, it is critical that the needs of the school practitioner be incorporated into the doctoral program. This will take dedication and perseverance because the majority of audiology doctoral graduates will be employed in other practice settings.

Although many courses within the audiology doctorate framework will benefit from the information about audiology service provision in educational settings, the inclusion of specific course work focusing on pediatric audiology, educational/legal issues, and client/family/student issues will realize the greatest benefit. Pediatric audiology courses will need to include areas relating to identification, assessment, amplification, and audiologic intervention. Educational/ legal course work should examine federal legislation such as IDEA, the Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act of 1973 (Section 504). Discussion of IDEA is a perfect opportunity to stress the importance of qualified providers and the importance of a well-run "Child Find" program that will identify children who are at risk for hearing loss. Discussion of educational/legal issues might also encompass issues that occur in the education setting and might cover information about health provider systems and case manager responsibilities. Client/family/student course work should stress the importance of: (a) counseling, (b) including parents as part of the educational team, and (c) increasing the audiology student's understanding of and sensitivity to cultural diversity and socioeconomic issues.

The mandate for the doctoral degree as the entry-level credential for audiologists and for continuing education gives proponents for school audiology services the opportunity to advocate for better preparation of individuals who practice in this setting. By doing so, the general knowledge level of those who practice will be broadened and the pediatric population will be better served. Now is the time for changes to occur.

CERTIFICATION AND LICENSING FOR AUDIOLOGISTS PRACTICING IN THE SCHOOLS

National Credentials

Audiology, like many other education and health-related professions, has national certification that is often required for employment, reimbursement, and career advancement. ASHA's Certificate of Clinical Competence in Audiology (CCC-A) is the national credential held by most audiologists seeking national-level recognition. Approximately 13,000 audiologists currently hold this credential (ASHA, n.d. - a). The American Board of Audiology (ABA) has a national credential that is held by approximately 700 audiologists (Phil Darrin, personal communication, April 9, 2003).

State Credentials

Licensure is required for the practice of audiology in most states. Forty-seven (47) states regulate audiologists, 44 through licensure and 3 through registration or certification (ASHA, 2002c). To date, licensure credentials have been modeled on ASHA's CCC requirements. Licensure boards are discussing how to modify their licensure laws to accommodate the impending change in educational preparation. Consistent with national trends, many licensure boards require continuing education/competence for renewal. However, not all employment in the public school sector requires state audiology licensure. Only 21 of the states that require licensure for the practice of audiology use this as the credential required in the public schools. Another 20 states have a special audiology credential for the practice of audiology in the schools. A review of these credentials suggests that they are also based on equivalent requirements found with the CCC-A and additional pedagogy courses or tests. Within the regulations for most of the states, the title *audiologist* is protected and reserved for individuals who hold state licensure or registration regardless of practice setting. In addition, many states also require registration or licensing that allows otherwise licensed or registered audiologists to dispense hearing aids. This often includes fitting and dispensing hearing-assistive technology as it relates to classroom educational amplification (e.g., FM systems). Typically, continuing education requirements are tied to this credential, allowing audiologists to fit and dispense hearing aids and other hearing assistive technology. Some LEAs prefer that the audiologist also hold a teaching credential—part of an antiquated system where teachers went on to become audiologists. It also reflects the management systems of SEAs where an audiologist category did not exist. The need for audiology to become recognized as a distinct profession in the public schools becomes more important as greater implementation of IDEA and Section 504 is realized. Professional development and staff improvement plans are most often a part of the requirements for continued employment within LEAs.

Anecdotally, many of the audiologists employed or contracted by LEAs seem to hold a variety of credentials that allow them to work across practice sites and maintain all aspects of their professional practice. For example, in New York State, an audiologist working in the public schools typically holds three different credentials from three different state-level credentialing bodies (State Department of Labor; State Education Department, Office of the Professions; and State Education Department, Office of Teaching).

Issues Facing the Credentialing Agencies

Credentials required for audiologists employed in the public school sector vary from state to state. Although most of the entry-level credentials appear to be based on the national certification, ASHA's CCC-A, there are differences. As mentioned, the continuing education/competence requirement for audiologists has been instituted in many states. Continuing education is also now a requirement for maintaining national certification. Credentialing agencies in states as well as national certifying agencies have unique requirements. Although some of these may overlap, they do not all require the same type, format, or amount of professional development for audiologists practicing in the schools. The new requirements for continuing professional development and a doctorate as the entry degree for practice as an audiologist will affect these credentialing bodies. As college and university programs that offer masters degrees in audiology close (a trend already in evidence), audiologists seeking positions in all settings will hold a doctoral-level degree. Credentialing bodies will need to determine if their credential will reflect the new standard and, if not, how to resolve the difference.

Issues Facing the State and Local Education Agencies

SEAs, LEAs, and administrators must examine carefully job descriptions, supervision requirements, and budgetary issues as they relate to audiologists. Although some LEAs may have doctoral-level staff, it is not the common degree. Attracting and retaining these professionals in the public school arena to provide service to children with a variety of significant needs will be a challenge. Salaries, equipment and material resources, autonomy, and respect are hurdles LEAs and SEAs will face. Additionally, collective bargaining units will need to examine their contracts carefully to represent best the needs of this small, but important, category of professionals. A question often posed is which credential is best suited for the types of responsibilities an audiologist has in the public schools. To date, it does not appear that one single credential suffices, but the prevailing credentials would suggest that the CCC-A does provide the basic clinical, rehabilitation, and counseling requirements needed. It becomes incumbent, however, on the State to define clearly the credentials necessary for practice in the schools. In doing so, consideration must be given to IDEA, ADA, and Section 504 provisions and Medicaid requirements as they pertain to reimbursement and school practices. LEAs also need guidance from the State to assure proper credentialing of independently contracted audiology providers. As mentioned earlier, credentials currently include for some: (a) teaching certificate, (b) license, and/or (c) registration for dispensing. This discussion alone can cause administrators to look at current staff to fulfill the functions of an audiologist. The myriad of credentialing requirements may cause confusion for administrators and result in inappropriate assignment of audiologist functions to another staff member.

Issues Facing Families and Children

Parents of young children first identified with hearing loss are often without the supports necessary to manage their child's intervention services and education appropriately. At the time of diagnosis and initiation of services, they must meet and work with so many different professions and people that they often feel alone and unprepared. Knowing the services available for infants, toddlers, and school-age children and then learning how to access these services can be overwhelming. Audiologists in the schools can assist parents in managing the educational experiences of their child with a hearing loss.

Children with hearing loss and/or auditory disorders may consider themselves academic failures, isolated, and/or singled out. School personnel often become the primary witnesses of the student's frustration, fatigue, and anger; but staff do not always recognize that the behaviors they see are a result of the child's hearing loss and/or auditory disorder. The educational audiologist is also able to assist school personnel in learning how to work with children with hearing loss and/or auditory disorders.

Issues Facing the Audiologist

Surveys, membership information, and other data suggest that there are fewer than 1,300 audiologists working in the schools in some capacity nationwide—a much smaller number of audiologists than is needed. School audiologists are a small percentage of the professional staff employed in this sector. This can lead to professional isolation, an overextension of responsibilities, and a tendency to be under-appreciated or supported by the administration.

Finding out the credentials needed, which is also the responsibility of the audiologist who chooses to work in the schools, can be formidable, because often required credentials are managed by different governmental bodies or divisions. Fees to obtain/maintain multiple credentials and the common need to affiliate with a collective bargaining unit are extra expenses for the audiologist working in the schools. Additionally, representation in a collective bargaining unit is often difficult, because audiologists often have a nontraditional role in the school setting. Gaining representation may also present another challenge to the audiologist who chooses to practice in schools and affiliate with collective bargaining units.

Continuing professional development will become an overwhelming activity for the busy audiologist employed in the LEA. Release time and financial support are concerns. Meeting and reconciling various requirements to maintain multiple credentials is indeed a challenge.

Audiologists are faced with rapidly changing technology, new research, and advanced and expensive instrumentation. Children in schools have increased listening and hearing needs. Schools have shrinking budgets. Ensuring quality services in or for schools will demand that audiologists work with LEAs to manage the provision of audiology services, program development, and contractual arrangements carefully.

Audiology services, which are clearly delineated in IDEA, are often delivered in a non-traditional manner in schools. Many parents and teachers do not know about these services. Advocacy at all levels is required to allow audiologists to provide services to our children in the schools. Organization of this effort and quality information continues to be a challenge for the audiologist working in the schools.

With all of its challenges, the critical role the audiologist plays in the schools is mandated by public law. The issues, hurdles, and challenges will be met with success if SEAs, LEAs, audiologists, administrators and other professionals, and bargaining units understand the importance of including the credentialed audiologist as a permanent and integral part of the educational team.

AUDIOLOGIST SUPPLY AND DEMAND

Needs Estimates

Estimates of the number of students in schools requiring audiology services. Estimating the number of students in schools requiring educational audiology services is a difficult task. Some LEAs may elect to provide services only to students who qualify under IDEA, Section 504, and ADA. Others may choose to make certain audiologic services available to all students, depending on the size and depth of the program. LEAs may currently choose to provide educational audiology services to children from birth to age 21, 3 to 21, or 5 to 21. LEAs, often by state law, are typically required to conduct audiologic screenings and hearing conservation programs for all children. Universal newborn screening programs have been helpful in early identification of hearing loss and better delineation of hearing needs by school age. It is anticipated that the increased number of children receiving cochlear implants will attend their neighborhood schools rather than being placed in special or self-contained classrooms or schools. LEA-based audiologists are involved in many of the programs and services directed toward children with hearing loss and/or auditory disorders. Depending on the depth and breadth of the services required and offered, estimating the numbers of students requiring audiology services can be complicated.

One source of information on the number of children who might potentially require or benefit from the services of an audiologist is the *23rd Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act* (2001). The total resident population of children 3 to 21 years old in 1999-2000 was 74,453,695 (Table AF1). The birth to age 2 resident population was 11,334,677 (Table AF2). Adding these two figures yields approximately 86 million children in the U. S. in need of audiology services of some nature.

Students identified with *Hearing Impairments*, (Table AA2**)** in the 1999-2000 school year were 71,539 students from 6 to 21 years old. If students with Deaf-Blindness (Table AA2**)** are added, an additional 1,840 students 6 to 21 years old were served. It is reasonable to assume that these children required audiology services. Knowing that hearing loss and/or auditory processing problems can coexist with all of the disabling conditions identified under IDEA, Table AA1 shows that during the 1999-2000 school year 6,253,853 students with disabilities from 3 to 21 years old were served under IDEA. Extrapolating from these figures suggests that the number of children from 3 to 21 years old in need of educational audiology services is over 6 million.

In addition to data from the report to Congress, which focuses only on services to students served under IDEA, data dealing with the prevalence and incidence of hearing loss in children are available. For example, in the document *Healthy People 2000*, the U. S. Public Health Service makes several statements about hearing loss in children:

- Over one million children in the U. S. have a hearing loss.
- 5% of children 18 years old and under have a hearing loss.
- Approximately 83 of every 1,000 children in the U. S. have what is termed an *educationally significant* hearing loss (U. S. Public Health Service, 1990).

Additionally, in *Healthy People 2010*, 2 or 3 out of every 1000 live births result in a baby with a congenital hearing loss and approximately 15% of all children have a hearing loss (U. S. Public Health Service, 2000).

Berg (1985) and Lundeen (1991) reported that approximately 19 out of every 1000 school-aged children have unilateral hearing loss that may interfere with their education. More recent research has found the number to be between 11.3% and 14.9%—an average of 131 of every 1,000 school-age children have some degree of hearing loss that affects learning and development (Bess, Dodd-Murphy, & Parker, 1998; Niskar, Kieszak, Holmes, Esteban, Rubin, & Brody, 1998).

While audiologists are very involved in the assessment, intervention, and management of children with (C)APD, it is difficult to estimate the number of children who may have auditory processing problems. Factors that complicate obtaining demographic data include the varying definitions of (C)APD and the fact that (C)APD is not a category of disability under IDEA. These children are often classified under IDEA as having a learning disability and/or a speech-language impairment. Chermack and Musiek (1997) estimated that 2% to 3% of all children have a (C)APD. Based on this estimate, given the resident population of children 3–21 years old as 74,453,685 (U. S. Department of Education, 2001), there are approximately 1,489,073 to 2,233,611 children in the U. S. with an auditory processing disorder.

Estimates of the number of audiologists currently employed in schools. Again, the *23rd Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act* (2001) cites data on FTE audiologists employed during the 1998–1999 school year (the only year reported) to provide special education and related services for children and youth with disabilities. In 1998–1999 (Table AC3), 1,051 fully certified audiologists were employed. In addition, there were 175 audiologists employed who were not fully certified as audiologists. This represents an increase in employment of 122 not fully certified as audiologists in comparison to the *22nd Annual Report* (U. S. Department of Education, 2000). Data on vacant positions are not available in this *23rd Annual Report*. However, the previous *22nd Annual Report* noted 36 FTE positions vacant. The presence of funded but vacant positions and the dramatic increase in the employment of individuals not fully certified suggests a shortage of educational audiologists. Using the total resident population figure for 1999–2000 of children 3 to 21 years as 74,453,685, there is approximately 1 educational audiologist for every 70,840 students in the U. S.

ASHA reports that 12,650 audiologists hold the Certificate of Clinical Competence in Audiology in the document *Highlights and Trends: Annual Counts of the ASHA Membership and Affiliation, 2002*. Table 6 of that report, *Demographic Profile of the ASHA Member and Nonmember Certificate Holders Certified in Audiology Only for January 1 through December 31, 2002*, indicates that of those who identified a primary employment facility (n = 10,095), 9.5%, or 959 certificate holders, indicated they were employed in a school (ASHA, n.d. - a).

Current and suggested ratios of educational audiologists to children. To serve adequately the needs of children in educational settings, 1 FTE audiologist for every 10,000 children aged birth through 21 years old served by an LEA is recommended (Colorado Department of Education Special Education Unit, 1998). ASHA's *Guidelines for Audiology Service Provision in and for Schools* (2002b) recommends 1 FTE audiologist for every 10,000 children as well. However, the guidelines state "when audiologists provide time-intensive services (e.g., direct management/intervention, service to infants and toddlers) and one or more

of the factors listed below is present a caseload ratio of 1:10,000 will be unreasonable and must be reduced. These factors will affect and influence the audiologist's case load:

- itinerancy/excessive travel time
- number of schools and LEAs served
- student placements with an LEA
- number of children with hearing loss and/or (C)APD
- number and ages of children with other disabilities requiring audiologic assessment and intervention services
- number of hearing aids, cochlear implants, and HATs (hearing-assistive technology systems) in use
- number of tests provided, including auditory test batteries
- number and ages of students receiving direct, ongoing audiologic intervention services
- number of infants and preschoolers receiving assessment and intervention services
- EHDI (early hearing detection and intervention) program responsibilities
- hearing loss identification/prevention/conservation program responsibilities
- scope of audiologic services provided (e.g., assessment, intervention, hearing aid dispensing)
- extent of supervisory and administrative responsibilities
- number of multidisciplinary team meetings and reporting requirements
- in-service training and counseling responsibilities
- other duties assigned that are outside the audiologist's scope of service delivery."

(ASHA, 2002b, p. II-122)

Trends that illustrate the impact of the factors listed above are identified in an ASHA report *2001 Omnibus Survey Practice Trends in Audiology* (ASHA, 2001c). ASHA questioned a sample of its constituents regarding their case loads. Those respondents working in schools reported an increased number of students with digital amplification and cochlear implants on their case loads. In ASHA's *Audiology Survey 2000 Edition: Final Report* (2000), 71.8% of audiologists working in schools report that they participate *Frequently* to *Very Frequently* on Individual Educational Program (IEP) development teams. More than 27% report that they participate on Individualized Family Service Plan (IFSP) development teams.

Based on the number of students with hearing loss identified and served under IDEA and the number of children with hearing loss and/or auditory disorders receiving or in need of audiology services under mandates (e.g., Section 504, ADA and/or other federal, state, local initiatives), it is clear that the need for LEA-based or contracted audiology services will not diminish in the near future. Additionally, with the advent of universal newborn and infant hearing screening, hearing loss in children will be identified early, and intervention programs will be instituted early. In increasing numbers, audiologists in educational settings should and will be involved in assessment, intervention, and management of these children. It is clear that educational audiologists provide comprehensive services in and for LEAs. Roles have expanded and continue to expand, which suggests that the recommended ratio of 1 FTE audiologist for every 10,000 students may be inadequate and should be improved.

Factors Influencing the Demand for Educational Audiologists

Legislative mandates. Mandates such as IDEA, Section 504, and the ADA all have requirements for determining eligibility, assessment and evaluation, re-evaluation, and program implementation and monitoring that require the services of an audiologist. IDEA's requirements for assistive technology and the assurance of proper functioning of hearing aids also require the expertise of an audiologist.

Health care regulations. Recently enacted legislation for universal newborn hearing screening will place identified children into early intervention programs sooner. In those states where the lead agency for "Child Find" and early identification and intervention programs is the SEA or LEA, educational audiologists have and will continue to have a major role in program development, management, and implementation.

Unique hearing and listening disabilities of children in schools that require specialized and frequent audiology services and technology. Some examples of situations requiring specialized and frequent audiology services are:

- an increasing number of children with cochlear implants in schools requiring extensive coordination, communication, and intervention between the LEA-based audiologist and the audiologist/other professionals at the cochlear implantation center
- proliferating use of hearing assistive technology (such as FM systems and classroom amplification) to complement student's personal hearing aids and the detailed on-site management required
- monitoring of fluctuating hearing loss (occurring with otitis media) and the accommodation required to assure a student's accessibility to the acoustic instructional environment
- providing direct intervention services to students with hearing loss or (C)APDs.

New federal initiatives in education. Legislation such as the No Child Left Behind Act (NCLB), Reading First, and other initiatives in the general education arena have involved audiologists in programs in listening skills development and phonemic awareness skills development for children who have not been classified as having disabilities.

Expanded roles of audiologists in schools beyond those associated with hearing loss. Examples of expanded roles of educational audiologists are:

- consulting with teachers as they employ strategies for meeting state standards dealing with listening skills

- consulting with teachers and administrators on reducing the effects of damaging noise on hearing that occurs in instructional environments, particularly in career and vocational education

- assisting schools in implementing standards for classroom acoustics including analysis of classroom noise and acoustics, making recommendations for improving the listening environment, facilitating acoustic accessibility to instruction (Acoustical Society of America [ASA], 2000; American National Standards Institute [ANSI], 2002; ASHA, 1995, 2002a, 2002b)

- working with teachers and administrators to assure appropriate classroom acoustics for instruction (creating an environment with appropriate signal-to-noise ratios and reverberation times) (ASA, 2000; ANSI, 2002; ASHA, 2002a, 2002b)

- providing assessments for children who fail audiologic screening as well as children with disorders other than peripheral hearing loss (e.g., (C)APDs, attention deficit disorders, learning disabilities, autism) and children served under Section 504 plans

- providing for and monitoring hearing assistive technology (e.g., personal and sound field amplification systems) to improve listening capability for students with hearing loss, (C)APDs and other disorders (e.g., attention deficit disorders).

Value placed on audiology services by a school district in the absence of mandates. Although all school districts must comply with state and federal mandates, some districts have come to value and involve the expertise of the educational audiologist throughout their programs and services. Educational audiologists have an understanding of curricula, the variety of settings and contexts of instruction (natural environments, hospitals, distance learning), and instructional dynamics (co-teaching, using teacher aides, one-on-one aides for individual students, instruction involving related service providers) (Huffman, 1997).

Factors Influencing the Supply of Educational Audiologists

Desire to work in a public school. Audiologists work in a number of employment settings, including health care (hospitals, nursing homes, home health, private physician's offices); clinics and agencies (speech and hearing centers); colleges and universities; private practice; industry; and schools (special schools, preschools, elementary and secondary schools, and intermediate units) (ASHA, 2001a). Given the roles/responsibilities and the knowledge/skills required for educational audiology services, some audiologists may choose not to work in schools. On the other hand, the working conditions, roles and responsibilities, and prestige in the school setting may be highly appealing for others.

Availability of employment. Regarding demand, small school districts may not necessarily hire audiologists. They may use intermediate education agencies or cooperatives to provide

audiology services or contract with a local agency, clinic, university, or private practice for specified audiology services. Regarding supply, there may be geographical "pockets" where universities in close proximity produce audiology candidates for certification, resulting in an oversupply of available audiologists. In other geographical regions (e.g., rural areas), there may be an undersupply.

Before recent changes to the audiology standards, the number of audiology students seeking doctoral-level degrees was declining. Therefore, audiology programs transitioning to the doctoral degree are faced with a shortage of doctoral-level faculty, thus limiting the number of students who can be admitted to programs. This may ultimately lead to an initial reduction in the number of audiologists entering the profession and a need for LEAs to increase recruitment and retention efforts.

Salary. ASHA's 2001 Omnibus Survey Salary Report (2001d) reports median academic-year salaries in school settings as $42,600 per year for audiologists. Median calendar year salaries for audiologists in private practice are $50,000. Audiologists working in LEAs are often covered by collectively bargained salary and benefits packages that may have immediate and long-term appeal. On the other hand, as audiologists begin to command higher salaries based on their doctoral degrees, salaries offered by LEAs may not be appealing or will have to be negotiated differently or outside of collective bargaining units.

Credentialing requirements. Credentialing requirements are in transition. Many audiologists, including those currently employed in schools, are in the process of obtaining an AuD or other doctoral degree. Individual states have requirements for licensing and teacher certification, which may or may not include a doctorate requirement for school employment. For example, with a transition to a doctoral degree, fewer audiologists may graduate, those who do graduate may be attracted to private practice where more attractive salaries are perceived, and schools with collective bargaining agreements may not offer salaries that persons holding doctoral degrees find attractive. Nonetheless, the impact on the supply of educational audiologists remains to be seen.

Critical Questions

Issues of supply and demand for audiologists in the schools require answers for several critical questions:

- Given the unique needs of children with hearing and listening disabilities in today's schools, how do professional preparation requirements for audiologists influence the supply and demand of audiologists who wish to work in school settings (i.e., educational audiologists)?

- How can certification requirements and licensure requirements promote easily accessible and high-quality services for students in schools?

- Given changing credentialing requirements, how can the supply of qualified audiologists be increased to meet recommend service levels, e.g., 1 FTE audiologist per 10,000 students?

- Given the date of the *23rd Annual Report to Congress*, what accounts for the significant increase in the number of personnel employed who are not fully certified as audiologists?

- Given legislative mandates and the limited funding resources of LEAs, how can educational audiology services be made available to students in need?

- What will the audiologist's role be in federal initiatives targeting children who are not identified as disabled but who must be provided services (e.g., those required in the No Child Left Behind Act, Reading First, and other initiatives undertaken as a result of presidential commissioned panels)?

- How can educational audiologists demonstrate efficacy? Given the current climate and interest on outcomes, how can audiologists better define and educate others about the value of their services?

- How can audiologists increase the visibility of their services and promote the provision of services when they are not mandated? If states and LEAs are not mandated to provide services, they are not likely to do so. Parents who are not aware of their rights to services will not request them. If name recognition is increased, will demand for services increase?

CONCLUSIONS

Research continues to document the high incidence of hearing loss in children of all ages and the potentially negative consequences hearing loss and/or (C)APD can have on communication, academic performance, and psychosocial development. The variable effects of hearing loss and/or (C)APD depend on several factors (e.g., nature and degree of loss or disorder). Thus, it is essential that children with hearing loss and/or (C)APD receive comprehensive audiologic services to reduce the possible negative effects of the loss or disorder and maximize their auditory learning and communication skills. Furthermore, all children in educational settings can benefit from audiologic services in developing listening skills, instruction in prevention of hearing loss, and the provision of accessible acoustic environments. It is clear that the preparation of audiologists who provide services in educational settings will be impacted by: (a) changes in audiology standards facilitating a need for SEAs and LEAs to evaluate and to modify the way in which they access and provide audiology services in the schools and (b) continuing professional development for LEA-based audiologists. As national credentialing standards change, it is imperative that states, SEAs, and LEAs examine and perhaps modify their licensure, registration, and/or certification requirements to accommodate provisions of the new audiology standards. In addition, as audiologists obtain and/or enter the profession with doctoral degrees, SEAs and LEAs will need to make fiscal modifications to accommodate the increased salary demands of LEA-based audiologists as well as increased fees for contracted services. LEAs will also need to implement or modify recruitment and retention efforts to attract audiologists with doctoral degrees to school settings.

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