

The “State” of Educational Audiology Revisited

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The Educational Audiology Association conducted a survey of state education agencies in 1990 (Johnson, 1991) to determine the status of audiological services being provided to children with hearing impairments in the schools at that time. A follow-up survey was conducted in 2007 to determine (1) the “state” of educational audiology throughout the United States and (2) if changes have occurred in the delivery of school-based services over the past 17 years. The results revealed that, although some changes have occurred, there have been no substantial improvements in the numbers of audiologists providing services in the schools. In addition, federally mandated guidelines have not provided for universal hearing screenings in every school system, and states have not substantially changed their definition of hearing loss for the purposes of considering a child for special education services.

Introduction

The provision of audiology services as a related service within the educational system in the United States was defined in the original version of the federal regulation that provided for a free, appropriate public education in the least restrictive environment (Education of All Handicapped Children Act, PL 94-142; 34 CFR, Chapter 3, section 300.13). Subsequent reauthorizations of this federal regulation, which is now known as the Individuals with Disabilities Education Act (IDEA), have continued to include a detailed definition of audiology services that need to be available to students with disabilities as a related service. IDEA includes regulations (Part C and Part B) that encompass services for children with disabilities from birth to 21 years of age.

As early as 1983, the American Speech-Language-Hearing Association (ASHA) published the “Audiology Services in the Schools Position Statement” with the purpose of providing educational agencies with (a) information regarding effects of hearing impairment on children, (b) the role of the audiologist for providing services to children identified with hearing impairment, (c) a directory of audiological services needing to be provided, and (d) models of service delivery. It was anticipated that this information would allow audiological services to be implemented in the schools.

That document was followed by the 1993 “Guidelines for Audiology in the Schools” and superseded in 2002 with ASHA’s “Guidelines for Audiology Service Provision in and for Schools.” The intent of the working group that developed these guidelines was to “fulfill the need for more specific procedures and protocols for serving individuals with hearing loss and/or auditory processing disorders in and for schools” (ASHA, 2002).

In 1990, a survey was conducted by the Educational Audiology Association (EAA) to determine the status of audiological services being provided to children with hearing impairments in educational settings (Johnson, 1991). Information was sought from the “Audiology/Hearing Consultant” at each state education agency, including the District of Columbia. Forty-eight of the 51 (94%) consultants provided information through either a returned survey and/or telephone interview. The survey asked respondents to report (a) the number of audiologists employed by school districts in their state, (b) the estimated number of districts which contract outside the school for educational audiology services, (c) the requirements for licensure or certification in their state, (d) the development of audiology guidelines in their state, (e) the recommended full-time equivalent (FTE) ratio for audiologist to general student population, (f) whether or not audiologists generate funds for caseloads, (g) the state’s status regarding use of third-party billing for audiology services provided by school districts, and (h) any decibel criteria used to define hearing impairment.

Johnson (1991) concluded that the survey results illustrated “the relatively obscure status of educational audiology services in most parts of our country.” Inconsistencies were found in both the availability and the quality of audiological services being provided, and it appeared that little had been done to improve the number of audiologists being employed by school districts, even fifteen years after the passage of PL-94-142.

The only other known research study addressing the status of audiological services provided in the schools comes from an unpublished doctoral project (Bone, 2000). The study involved a survey containing questions meant to update and evaluate the 1990 Johnson survey.

Responses were obtained from only 25 states. Bone's survey asked respondents the majority of the same questions sent out in the 1990 Johnson survey; however, two additional questions concerning student enrollments and educational settings were added.

The author concluded that "more audiologists appear to be providing services to the hearing impaired in schools nationwide" (Bone, 2000, p. 25), and that there has been a "slight improvement" over the Johnson findings with 19% more of the states requiring some form of certification. The author, however, made these statements with only 50% of the United States being represented, and no statements were made about the variability in the application and availability of educational audiology services across and within states.

Several changes have occurred within the educational system in the United States since Johnson (1991) reported on the status of educational audiology. New federal initiatives in regular education, such as the No Child Left Behind Act (NCLB; 2001), in some cases, expanded the role of audiologists in areas such as listening skills development and phonemic awareness development for children who have not been classified as having disabilities (Brannen, Huffman, Marttila, & Williams, 2003). In addition, NCLB, along with IDEA (2004), requires that schools incorporate appropriate accommodations and modifications for students who need assistance in order to access general education instruction and curricula. Civil rights legislation, such as Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (1990), which require schools to provide all students with access to the educational environment including auditory access, have had greater influence in the academic arena. All together these educational initiatives and civil rights legislation have increased the role of educational audiologists in schools and, therefore, increased the need for personnel.

A survey study to update information on educational audiology practices within the United States was conducted from December 2006 to May 2007. Some of the survey questions were similar to the original 1990 survey questions from Johnson (1991), while other questions sought to obtain more in-depth answers and reflected changes due to the passage of time. This study was completed in an attempt to describe the "state" of educational audiology around the country and to determine if improvements have been made in the service delivery of school-based audiology over the past 17 years.

Method

Participants

The survey was sent to state education agencies' speech-language-hearing consultants (as listed on the ASHA website). This was the group of respondents solicited for the Johnson (1991)

survey. In addition, information was sought from members of the Educational Audiology Association's listserv. These respondents were also solicited to triangulate data from several different sources. After six months of data collection, usable responses were obtained from 45 states and DC. (Note to reader: For the purposes of reporting, we will be referring to DC as a "state".) Surveys were supplied from every state but Idaho, New Hampshire, and Rhode Island. Connecticut and Mississippi provided information; however, the data were incomplete (i.e. had missing information).

Survey Instrument

The survey (Appendix A) included a demographic section containing one question asking for the state's name, a content section containing 11 questions, and an optional information section asking for voluntary personal contact information and additional contact information. The survey was approved by both of the authors' Institutional Review Boards.

Survey questions were included to determine if a state license is required of audiologists in each state and if any certification or licensing and special training/qualifications for educational audiologists exists in each state. Further questions were included to determine the number of school districts that employ or contract educational audiologists in each state and the total number of full time equivalent (FTE) audiologists and contractual audiologists employed by the school districts in each state. Additional questions determined whether or not educational audiologists generate funds for their case loads (and how) in each state. One question asked for the recommended ratio for FTE audiologists to general student population for each state, while another question asked if any unified guidelines for the practice of audiology in the public schools exist for each state. The survey asked if any laws exist that require schools to provide hearing screening for school-aged children in each state and if any unified guidelines for hearing screening practices in public schools exist. The final two questions asked if there are written criteria for defining a hearing loss for special education consideration and if there are written criteria for determining qualification for services of students who are D/HH in each state. Physical copies of the written criteria were requested to be sent to the authors, either electronically or in hard copy form (specifically for questions 8 through 11). Ultimately, the last question (#11) was discarded and no analyses were performed. The answers given to this survey question did not match the intent of the question, and therefore, it was determined that the wording of the question was not clear.

Procedures

A cover letter containing the survey and explaining the goals of the study was emailed in December of 2006 to the state education agency's speech-language-hearing consultant and members of the EAA listserv, as described above. If a response to the survey was

not obtained after four months, then selected audiologists from the EAA membership directory were contacted and asked to complete the survey. In addition, if survey respondents were uncertain of an answer, or if two or more respondents from a state gave conflicting information, the authors went to the ASHA website and/or state Department of Education websites to confirm answers, when possible. If information could not be obtained from a website, the response was left blank for that state. Data collection was discontinued at the end of May 2007.

Results and Discussion

Certification and Licensure for School-Based Audiologists

The first question on the survey asked the respondents if licensure/certification requirements exist for audiologists in their state. Of the 46 responses obtained, 43 respondents indicated that licensure exists for audiologists in their state and three respondents (CO, IN, DC) indicated that licensure did not exist. In 1991, Johnson reported that 34 of the respondents reported that their states required licensure and/or state Department of Education certification. Of the remaining 14 states, two states required ASHA certification and 12 states either had no requirements or exempted public school employees from certification.

It is difficult to compare the results of the present study to that of the Johnson (1991) study in this area because the 1990 survey did not specify what types of licensure (i.e. state, department of education) or certification (i.e. ASHA, ABA, teacher) were reported. According to the ASHA website (www.asha.org) at the time the present survey was conducted, all 50 states had general licensure requirements for audiologists to practice in their state. The District of Columbia did not have licensure for audiology. The information reported for this survey regarding licensure for audiology closely matched the information available from ASHA. However, two state respondents (IN and CO) indicated that no licensure for audiology existed in the state when, according to ASHA, it does exist. The present survey did not ask respondents to indicate whether or not their state requires a general state license to practice audiology in the schools; however, according to ASHA, 18 states required a state license at the time of the present survey (DE, GA, HI, IL, IA, LA, MD, MT, NJ, NM, NY, NC, OH, SC, TX, VT, VA, and KS).

The follow-up to this first question asking about state licensing asked if there were any special license/certificate required specifically for audiologists to work in the schools. Fourteen respondents indicated that their states required some form of special license or certificate (AK, CA, CO, GA, MN, NE, NV, OH, UT, VT, WA, WV, WI, DC). The remaining 32 respondents

Table 1
State-by-state comparison of state requirements of special license/certificate for audiologists working in the schools.

| | 2007 Survey (Richburg & Smiley) | ASHA Website (2007) |
|----------------------|---------------------------------|---------------------|
| Alaska | Yes | Yes |
| California | Yes | Yes |
| Colorado | Yes | Yes |
| Georgia* | Yes | No |
| Idaho^ | Unknown | Yes |
| Indiana* | No | Yes |
| Iowa* | No | Yes |
| Minnesota | Yes | Yes |
| Mississippi^ | Unknown | Yes |
| Nebraska | Yes | Yes |
| Nevada | Yes | Yes |
| Ohio* | Yes | No |
| North Carolina* | No | Yes |
| South Dakota* | No | Yes |
| Utah | Yes | Yes |
| Vermont* | Yes | No |
| Washington | Yes | Yes |
| West Virginia* | Yes | No |
| Wisconsin | Yes | Yes |
| District of Columbia | Yes | Yes |

Note: * = states where discrepancy exists between survey report and ASHA website; ^ = states where no data were available for the survey, but ASHA reported teacher certification required for audiologists to practice in the schools.

indicated no special license/certificate. ASHA also reports this type of information for audiologists who work in the school setting. There were some discrepancies between what was reported for this survey and what was reported by ASHA (see Table 1).

The second follow-up question asked if any special training or qualifications must be obtained in order to practice in that state's school districts. Six respondents (CA, CO, OH, UT, WI, DC) indicated that their states required special training or qualifications, 37 respondents indicated that their states did not require special training or qualifications, and three respondents (MN, MO, TN) either stated that they did not know the answer or did not provide an answer.

In the current survey, only six states appear to require special training or qualifications, as compared to five states in the Johnson (1991) survey. Johnson made the argument that, whereas speech-language pathologists are often required to do a practicum in the school setting as a part of their pre-service training, audiologists are apparently not required to have specialized coursework or practicum experience in a school setting. If audiology students are neither exposed to the school setting nor required to have any specialized training for the school setting, it is likely that the quality of service provided initially in school settings would be sub-standard.

School-Based Audiologists and School Districts

The second question on the survey asked how many school districts in each state directly employ at least one audiologist.¹ In 1991, Johnson reported the number of audiologists employed by the school districts ranged from 0 (including unfilled positions in Kentucky) to 67 (Iowa). A total of 529 audiologists were employed in 38 states.

Again, a direct comparison between the two surveys is difficult to make. However, for the present survey, 35 states indicated that a total of 468 districts directly employ at least one audiologist (this does not include districts that have access to an audiologist via an educational cooperative or education service agency). In eleven states (AL, CA, MI, NJ, NM, NY, OR, PA, SC, TN, and TX), this information was unknown. There were an estimated 14,556 school districts across the United States at the end of the 2006-2007 school year (Council of Chief State School Officers, 2009). According to the present survey, only 3% of the school districts in the United States directly employ an audiologist. However, these data should certainly be interpreted with caution because information about how many districts access audiology services through educational cooperatives or via contract services is not readily available.

The third question asked for the total number of FTE audiologists directly employed by school districts in each state. This information was unknown in twelve of the states (CA, MI, NJ, NM, NY, NC, ND, OR, PA, TN, TX, and VA). For the remaining 34 states, there were a reported 565.53 FTE audiologists (see Table 2).

As can be seen in the table, nine states have increased the number of FTE audiologists since 1990. Fourteen states have essentially the same number of FTE audiologists as they did in 1990, and three states have fewer FTE audiologists than they did in 1990. Twenty-five states could not be compared, however, due to missing or unknown information in either survey.

Question 4 asked how many school districts

¹It should be noted that there are several states in which districts do not directly employ audiologists, but access audiological services from a regional "educational cooperative" instead. For example, Georgia has five Rural Educational Services Agencies (RESA) which employ audiologists, and those audiologists provide services to the schools that are served by those RESAs. In Iowa, Area Education Agencies (AEAs) have audiologists who provide services to schools in their respective AEA.

Table 2

State-by-state comparison of the number of FTE audiologists directly employed by school districts from 1990 survey responses to 2007 survey responses.

| State | 1990 Survey (Johnson) No. of Ed. Auds. | 2007 Survey (Richburg & Smiley) No. of Ed. Auds. | Change |
|----------------|---|---|--------|
| Alabama | 5* | 45.85 | More |
| Alaska | 1 | 3 | Equal |
| Arizona | 10* | 10 | Equal |
| Arkansas | 0# | 1.61 | Equal |
| California | 43* | @ | CND |
| Colorado | 28 | 43 | More |
| Connecticut | 3* | -- | CND |
| Delaware | 1 | 2 | Equal |
| Florida | 36 | 55.10 | More |
| Georgia | 25* | 34 | More |
| Hawaii | 1 | 1 | Equal |
| Idaho | 3 | -- | CND |
| Illinois | 48* | 50 | Equal |
| Indiana | 7 | 7.10 | Equal |
| Iowa | 67 | 58 | Less |
| Kansas | 23 | 27 | More |
| Kentucky | 0^ | 2 | Equal |
| Louisiana | -- | 14 | CND |
| Maine | -- | 0 | CND |
| Maryland | 12 | 30.80 | More |
| Massachusetts | -- | 5 | CND |
| Michigan | 25* | @ | CND |
| Minnesota | 20 | 47 | More |
| Mississippi | 5* | @ | CND |
| Missouri | 10 | 17.07 | More |
| Montana | 5* | 0 | Less |
| Nebraska | 5* | 6 | Equal |
| Nevada | -- | 8 | CND |
| New Hampshire | -- | -- | CND |
| New Jersey | -- | @ | CND |
| New Mexico | -- | @ | CND |
| New York | 0# | @ | CND |
| North Carolina | 24 | @ | CND |
| North Dakota | 3 | @ | CND |
| Ohio | 10* | 9 | Equal |
| Oklahoma | 5* | 1 | Less |
| Oregon | 6 | @ | CND |
| Pennsylvania | 13 | @ | CND |
| Rhode Island | -- | -- | CND |
| South Carolina | 5 | 12 | More |
| South Dakota | 2 | 0 | Equal |
| Tennessee | -- | @ | CND |
| Texas | 30 | @ | CND |
| Utah | 10* | 12 | Equal |
| Vermont | 2 | 1 | Equal |
| Virginia | -- | @ | CND |
| Washington | 22 | 25 | Equal |
| West Virginia | -- | 10 | CND |
| Wisconsin | -- | 20 | CND |
| Wyoming | -- | 4 | CND |
| DC | -- | 4 | CND |
| Total | 515* | 565.53 | |

Note: * indicates estimate; # indicates 2 employed by state Department of Education; ^ indicates 3.5 unfilled positions; @ indicates unknown data; -- indicates missing data; CND indicates that the information could not be determined.

in each state contract with an audiologist who is not directly employed to provide services to students. It should be noted that some respondents included districts that receive services from the educational cooperatives mentioned above, but it is not known if these services are truly educational (school-based) audiology services or simply a once a year (contractual) visit. Twenty-two of the states had unknown or inconclusive data. Seven state respondents indicated that there were no districts in their states that contracted audiologists to work in the schools (AZ, DE, HI, IA, MO, WI and DC). The remaining 17 states reported a total of 246 school districts that contract services from an audiologist (AR, CO, IL, KS, LA, ME, MA, MT, NC, ND, OK, SD, UT, VA, WA, WV, WY).

In 1991, the number of districts which contracted outside the school for educational audiology services could not accurately be portrayed (Johnson, 1991). For example, respondents from five states reported that any district in their state that did not directly employ an audiologist contracted for audiological services. Other respondents indicated that “most districts” or “many districts” contracted for audiology services. All that can be ascertained from the 1991 data is that respondents from eight states reported a total of 100 districts as contracting audiologists.

In comparison to the Johnson (1991) data, it would appear that there has been an increase in the number of districts that contract audiology services across the states (from 100 to 246 school districts). When added to the 468 school districts that directly employ at least one audiologist (Question 2), this would increase the number of school districts who have access to school-based audiology services to 714. However, these contract services could range from daily contact in the district by an audiologist to an audiologist seeing students for hearing evaluations in his/her office. Even if all 714 of the districts that either employ an audiologist or contract with an audiologist have *true* school-based audiology services (i.e., audiology services that are provided on-site within the school setting; typically involving interaction with school personnel and relating to a specific student’s auditory needs and not just diagnostic assessment of hearing), this number is only 4.9% of the total number of school districts reported to be operating at the end of the 2006-2007 school year.

The fifth question asked each state’s respondent if audiologists (both directly and contractually employed) generate funds for their case loads. A follow-up to that question asked from where the funds came and gave examples, such as Medicaid and insurance billing. There were 23 respondents who reported that audiologists in the schools in their states generate funds (AZ, CA, CO,

GA, IA, KS, LA, ME, MD, MI, MO, MT, NM, NY, OK, OR, PA, SC, TX, UT, WV, WI, DC), ten respondents reported that audiologists in the schools in their states do not generate funds (AR, DE, FL, HI, IN, NE, OH, VT, VA, WY), and 13 respondents indicated that they did not know the answer (AL, AK, IL, KY, MA, MN, NV, NJ, NC, ND, SD, TN, WA). Of the 23 respondents who reported that funds are generated by audiologists in the schools, all indicated that the funds came from the state Medicaid system (e.g., MediCal, TennCare, Medicaid, etc.). One of the 23 respondents (ME) indicated that s(he) also billed private insurance providers for audiology services provided in the school.

Johnson (1991) predicted (based on the 1990 survey results) that the practice of third-party billing by educational audiologists was evolving in many states and could potentially be a viable source for supplemental funds for school districts. All states responding to the 1990 survey indicated that funds were *not* being generated by educational audiologists based on their caseload *unless* the audiologist was providing direct therapeutic or instructional intervention (such as that provided by a speech-language pathologist or teacher). Johnson (1991) stated that third-party billing for audiological services in the schools was reported by 11 states (AL, AR, IN, IA, MN, MO, NY, OR, PA, SC, and WI) and five states reported that they were considering using it for audiological services in the schools (CT, MI, MT, NC and SD). In the present study, when state respondents were asked if audiologists generate funds for their case loads, 23 of 46 state

Table 3
States that reported a recommended full time equivalent (FTE) ratio for audiologists-to-general student population and those ratios for the 1990 and 2007 surveys.

| 1990-Johnson | | 2007-Richburg & Smiley | |
|----------------|------------|------------------------|---------|
| State | Ratio | State | Ratio |
| Alabama | ----- | Alabama | 1:15000 |
| Colorado | 1:12000 | Colorado | 1:10000 |
| Georgia | 1:18000 | Georgia | 1:12000 |
| Kansas | 1:10000 | Kansas | 1:12000 |
| North Carolina | 1:15-20000 | North Carolina | ----- |
| Virginia | ----- | Virginia | 1:15000 |

respondents reported that at least some of the schools in their state generate funds via their state Medicaid system. This increase in number supports Johnson's predictions, and it could be assumed that more states are tapping into this supplemental funding source. However, one would want to be cautious in interpreting this information, due to the fact that *some* of the schools within each state billed third-party payers, but not necessarily all.

State Regulations Regarding Educational Audiology

Question 6 asked what the recommended FTE ratio for audiologists-to-general student population was for each state, and if there was not a recommended FTE ratio, the respondents were asked to write "N/A." Only five states (AL, GA, KA, VA, and CO) reported FTE ratio recommendations (see Table 3).

In 1990, four states (CO, GA, KS, and NC) reported an FTE ratio, and in 2007, five states reported a ratio. This is not a substantial increase for 17 years. As can be seen in Table 3, Alabama and Virginia now report an FTE-to-student ratio, but North Carolina does not. The states of Colorado, Georgia, and Kansas reported FTE ratio information in 1990 and in 2007, and it was encouraging to see that Colorado's and Georgia's ratios both went down (i.e., fewer students for each audiologist). Only Kansas appears to have more students per audiologist in 2007 than it did in 1990. However, because a significant number of states still do not use an FTE-to-student ratio, there is a concern that the workload for school-based audiologists is too high.

Question 7 asked if there were unified guidelines for audiology practices in the public schools of each state. Four states (CO, GA, MO, and MT) reported that there were unified guidelines. Thirty-four state respondents reported that there were no guidelines, and eight state respondents did not know (AL, CA, MN, NV, NM, PA, SD, TN). Upon review, however, it was determined that what was reported for Missouri and Georgia were not actual guidelines for the practice of audiology in the schools. Therefore, Colorado and Montana appear to be the only states with unified guidelines for audiology practices in the public schools. This is down from 1991, when Johnson reported that 13 states had written school audiology guidelines, with only eight of those guidelines being comprehensive.

Hearing Screening Regulations and Guidelines

The eighth survey question asked if the respondent's state had a law that requires schools to provide hearing screening for school-aged children. Twenty-seven respondents indicated that their states had laws that require school screenings, 11 respondents indicated that their states did not require school screenings (AL, GA, IA, MO, NC, ND, OK, VT, WV, WI, WY), and eight respondents did not know the answer for their states (KY, MN, NJ, OR, SD, TN, UT, DC).

The ninth question on the survey asked if unified guidelines

for hearing screening practices exist in each state's public schools. Twenty-six respondents indicated that their states had unified guidelines for screening practices, 13 indicated there were no unified guidelines for screening practices (AL, AR, GA, HI, IA, NV, NC, ND, OK, OR, UT, VT, WY), and seven respondents did not know the answer for their states (AK, KY, MN, NJ, SD, TN, DC).

The Johnson (1991) survey did not ask these two questions; therefore, no comparison can be made. However, it was interesting to note that 27 out of 46 states (58.7%) reported a state law that requires schools to provide hearing screenings, but three of those states (AR, HI and NV) indicated that there were no guidelines to help audiologists (or other personnel who may be doing those screenings) adhere to the state's laws. Eleven respondents, or 23.9% of the states in this survey, reported no state law requiring school hearing screenings. Therefore, numerous children in the schools may go through their entire education process without having a hearing screening. In addition, with 13 respondents (or 28.3% of the states) reporting no unified hearing screening guidelines, these findings support McCormick Richburg & Imhoff's (2007/2008) conclusions that different schools, even those within the same school system, often follow different hearing screening protocols.

Defining Hearing Loss across the United States

Question 10 asked if the respondent's state had written criteria (in regulations or guidelines) for defining a hearing loss for special education considerations. If no written criteria for defining a hearing loss were available, a follow-up question asked at what level (i.e., individual school, school district, regional, etc.) are criteria established. Thirty-eight respondents reported having written criteria for defining a hearing loss, while four states reported that they did not have such criteria (IL, NC, TX, VA). Four state respondents did not know if criteria were available in their states (IA, MN, ND, WV).

The authors examined documents from the 38 states that had written criteria for defining a hearing loss to determine if these written criteria went beyond (i.e., specified a decibel criteria or included unilateral and/or high frequency hearing loss in the definition) the IDEA definition of hearing impairment. IDEA (2004) contains a definition for deafness and for hearing impairment:

Deafness means a hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, that adversely affects a child's educational performance. [Section 300.8(c)(3)]

Hearing impairment means an impairment in hearing whether permanent or fluctuating, that adversely affects a child's educational performance but that is not included under the definition of deafness in this section. [Section 300.8(c)(5)]

Sixteen of the 38 states who had a written criteria for defining a hearing loss went beyond the IDEA definition of deafness/hearing impairment, with most specifying a decibel criteria (e.g. 20 dB pure-tone average in the better ear, etc) or including unilateral and/or high frequency hearing loss in the definition. Eighteen of the 38 states did not have criteria that went beyond the IDEA definition, and for the remaining four states, it could not be determined if the definition of hearing loss went beyond that of IDEA (2004).

In the earlier survey, Johnson (1991) asked respondents to report only the decibel criteria used to define hearing loss for the purposes of eligibility for special education services. Johnson (1991) did not ask if the state had written criteria for hearing loss. At that time, 13 states reportedly had specific decibel criteria for defining hearing loss, with only seven states providing specific levels. Although a direct comparison cannot be made due to the differences in the wording of the questions on the two surveys, it was of interest to note that there was probably not a significant increase in the number of states (i.e., from 13 to 16) who use a decibel criteria for defining hearing loss from the 1991 survey to the present survey.

Further Discussion of Results and Their Implications

The results of the Bone (2000) study indicated that “the average number of educational audiologists employed per state had increased dramatically” (p. iv). However, representatives from only 25 states responded to the survey, and the respondents to the survey (the State Director for Special Education) were not school-based audiologists or individuals with knowledge specific to audiology. In addition, although an increase in the number of educational audiologists was reported, the author did not take into consideration that the number of students in the schools also increased. In fact, according to Hussar and Bailey (2008), from 1992 to 2005 (the years closest to 1990 and 2000 for comparison purposes) the enrollment numbers for elementary and secondary students increased from 48.5 million to 55.2 million (a 14% increase in enrollment). Therefore, at the time that Bone collected her data, the ratio of school-based audiologists-to-students may actually have been lower than when Johnson collected her data.

Another factor that may add to the misrepresentation of the presence of audiologists in the schools is the way in which some states employ audiologists via educational cooperatives or service agencies. The service delivery model in and of itself is not the problem; however, the way that the questions were phrased in the present survey made it difficult for respondents to provide a comprehensive picture of school-based audiology in their state if the cooperative model was used within that state. For example, Iowa is divided into 11 education agencies (Deb Rowland, personal communication, June 25, 2007). Those agencies employ audiologists who in turn provide the school-based audiology

services to the schools within that agency area. Therefore, when asked how many audiologists work in schools in a given state, a number could be given. However, when asked how many school districts directly employ an audiologist *or* how many school districts contract with an audiologist, this may be difficult to answer in states that use a cooperative or agency approach. Those cooperatives/agencies neither directly employ nor contract the audiologists.

It was surprising to these authors to see how many respondents either did not know specific information about the state in which they practiced, or were not able to supply correct information. (That is, information that did not match the information provided by additional respondents, or information provided by ASHA.) The number of survey responses, which either indicated the audiologist did not know the information or the information was inaccurate, would support the recommendations of Lenich, Bernstein, and Nevitt (1987), who proposed specific training and accreditation for educational audiologists. Lenich et al. (1987) stated, “It seems reasonable that if individuals are committed to educational audiology as a specialization, and if they work to complete training in this area, some recognition of their unique skills should be granted” (p. 350). These authors recommended a combination of credentials (i.e., CCC-A and Accreditation in Educational Audiology awarded by the Educational Audiology Association) after completion of specified coursework, such as pediatric audiology, teaching speech to hearing-impaired children, techniques of auditory training, aural habilitation, American Sign Language, etc. In addition, mini-courses were suggested for supplying additional information on topics, such as “effective use of group amplification,” “personnel management,” and “working within the educational system.” Although few universities offer coursework specializing in educational audiology, six states appear to require special training or qualifications in order to work as an audiologist in a school setting, as compared to five states in the Johnson (1991) survey.

Caveats

After initiating this study, the authors realized that it would be difficult to address their initial goals completely. First of all, it became evident that it is difficult to determine from whom one seeks this sort of information. Should a school district representative be answering these types of questions, or should a representative from the state’s Department of Education? Would a group of school-based audiologists who practice within that state be most capable of answering these questions, or would their administrators or policy makers? Should people from a combination of these specializations respond to the questions, or would that just confuse the matter more?

In addition to these concerns, it became evident that state laws

and school policies are constantly changing. For example, since 2007, Arkansas now has more school districts which are accessing school-based audiology services via contracts, direct employment, or through a cooperative system. In addition, DC now has state licensing for audiology. Additional updating of this information will be needed in order to keep practitioners abreast of the changes and these updates should be made on a more frequent and regular basis.

Implications of Survey Findings

A challenge all audiologists face on a national level is that policy makers often seek information reported by federal agencies when making policy decisions. The Office of Special Education Programs (OSEP) reports data regarding personnel who are serving students with disabilities. OSEP gathers this data from states each year. Data for the years 2003 - 2006 is available on the web at www.ideadata.org. Included in the data is information about audiologists who are either employed or contracted to school districts. When asking states about audiologists who serve students with disabilities, OSEP asks how many full time equivalent (FTE) audiologists are providing school-based audiology services, either as direct employees or contracted employees. Therefore, it is difficult to make a direct comparison to the data in the present study because the questions were not asked in that same manner. Additionally, it is important to note that when looking at the OSEP data, some inconsistencies are seen. For example, for the state of Alabama, it was reported in 2003 and 2004 that nine and ten FTE audiologists, respectively, were working with students in schools. Then in 2005, it was reported that there were 46 FTE audiologists in the state. That number dropped down to 21 FTE in 2006. These types of "outliers" were seen for several states from year to year in the OSEP data (e.g. CA, NJ, NC and TN). Therefore, it is apparent that a better system for data collection is needed in order to determine how school districts are providing audiology services, or if they are simply choosing to ignore the provision of this related service.

For those audiologists who practice in school settings (and those who want to), a concerted effort must be made to better educate school personnel, families of students who are hard-of-hearing or deaf, and policy makers at federal and state levels. It is critical to convey to these constituency groups that school-based audiology services are *necessary* for students to benefit from their education. In addition, administrators and policy makers need to be made aware that audiology services are not just for special education. Departments of Education, along with OSEP, need to also be involved in enforcing a more uniform application of the provision of audiology services in the schools. Specifically for states where little to no school-based audiology services are being provided, it would seem that there is a need for intervention either

at the state level or possibly the federal level. Classroom acoustics and hearing loss prevention are just two of the areas in which audiologists should be making an impact in the school setting. The question, "Why is the application of the related service of school-based audiology so different from that of the related services of speech-language therapy, occupational therapy and physical therapy services?" needs to be addressed with administrators and policy makers.

Therefore, the biggest challenge school-based audiologists face in this education effort is *public awareness*. Students with hearing loss and school personnel need to be made aware of audiology services, since they are the people served by school-based audiologists. Families of students with hearing loss need to be better educated about their rights to have audiology, as a related service, included in the student's Individualized Education Program. Lastly, but just as importantly, school-based audiologists need to work to make all audiologists aware of the specialized practice area of school-based audiology so they can, in turn, help to educate the individuals who come through their clinical practices about the need to have access to school-based audiology services. Currently practicing school-based audiologists need to be active in the training and education of audiology students. These authors suggest that school-based audiologists volunteer to provide guest lectures in a local university's Au.D. program, or teach a course on educational audiology as an adjunct instructor. In addition, becoming a preceptor and accepting Au.D. students for off-campus clinical experiences will nurture new audiologists interested in entering the schools.

Conclusions

As mentioned previously, this study was completed in an attempt to describe the "state" of educational audiology around the United States and to determine if improvements have been made in the service delivery of school-based audiology over the past 17 years. Unfortunately, the results of this 2007 survey would indicate that overall improvements in the "state" of school-based audiology have not been made. It appears, as it did back in 1990, that school-based audiology is not practiced in the same manner from one state to the next. Additionally, in many states, school-based audiology is not practiced the same way even within the state. This creates confusion not only for the audiologists, but for the school personnel *and* the parents of the children who are being served.

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Appendix A Survey Questions

The Practice Patterns of Educational Audiology in the United States

Survey

NOTE: You may complete this survey (1) by printing the document and hand writing your responses, OR (2) by completing it electronically. If you wish to answer the survey electronically, PLEASE save it to your computer's hard drive. THEN re-open the survey and answer the questions. If you open the survey and answer it without saving the document to your hard drive, you may not be able to retrieve your answers. THANKS!

Demographic Information:

You have been invited to participate in this survey as a representative of what state?

State-Specific Questions concerning Educational Audiologists:

Please answer the following questions as completely and honestly as possible **with respect to the above-mentioned state:**

1. What licensure/certification requirements exist for audiologists in your state?
Is there a special license/certificate required specifically for audiologists to work in the schools? YES NO I DO NOT KNOW (circle one)
Is there any special training or qualifications that an audiologist must obtain in order to practice **in your state's school districts?**
YES NO I DO NOT KNOW (circle one)
2. How many school districts in your state **directly** employ at least one audiologist?
3. What is the total number FTE (full time equivalent) audiologists **directly** employed by school districts in your state?
4. How many school districts in your state **contract** with an audiologist who is not directly employed to provide services to students?
5. In your state, do audiologists (both directly and contractually employed) generate funds for their case loads?
YES NO I DO NOT KNOW (circle one)
If so, where do those funds come from? (Examples: Medicaid billed, insurance for evaluations or amplification, etc.)
6. In your state, what is the recommended Full-Time Equivalent (FTE) ratio for audiologists to general student population? If your state does not have a recommended FTE, please indicate with N/A.
7. Does your state have unified guidelines for audiology practices in public schools?
YES NO I DO NOT KNOW (circle one)
If so, please provide a physical copy, an electronic copy, OR a web address where the document can be found.
8. Does your state have a law that requires schools to provide hearing screening for school-age children?
YES NO I DO NOT KNOW (circle one)
If so, please provide a physical copy, an electronic copy, OR a web address where the document can be found.
9. Does your state have unified guidelines for hearing screening practices in public schools?
YES NO I DO NOT KNOW (circle one)
If so, please provide a physical copy, an electronic copy, OR a web address where the document can be found.

10. Does your **state** have written criteria (in regulations or guidelines) for **defining a hearing loss** for special education consideration?

YES NO I DO NOT KNOW (circle one)

If so, please provide a physical copy, an electronic copy, OR a web address where the document can be found .

If not, at what level (i.e., individual school, school district, regional, etc.) are the criteria established?

11. Does your **state** have written criteria (in regulations or guidelines) for **determining qualification for services** of students who are deaf/hard of hearing?

YES NO I DO NOT KNOW (circle one)

If so, please provide a physical copy, an electronic copy, OR a web address where the document can be found .

If not, at what level (i.e., individual school, school district, regional, etc.) are the criteria established?

Optional Information

** Disclosure of personal contact information is completely voluntary and is **NOT** necessary to complete the survey. If you choose to provide personal contact information for items 1 and/or 2 below, it will be used solely for the purposes specified. It will also be stored in a separate location from the survey responses.

1. If you choose to provide **your own** personal contact information, it may be used solely for the purpose of contacting you should follow-up questions be generated by your survey responses.

Name: _____

Position: _____

Agency: _____

E-mail Address: _____

Phone #: _____

2. Is there a contact in your state who you believe would be able to provide additional or more specific information concerning the state of educational audiology practices in the state for which you are reporting?

If so, please provide **their** contact information below to be used only for the purpose of requesting their participation in this survey.

Name: _____

Position: _____

Agency: _____

E-mail Address: _____

Phone #: _____