NATIONAL DISTRIBUTION OF PHYSICAL AND OCCUPATIONAL THERAPISTS SERVING CHILDREN WITH DISABILITIES IN EDUCATIONAL ENVIRONMENTS

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ABSTRACT

Each year, the United States Department of Education collects data on the number of children with disabilities and the number of service providers meeting their needs in the educational system. The purpose of this investigation was to reanalyze the U.S. Department of Education data to determine state and regional ratios of physical therapists and occupational therapists to children with disabilities frequently served by therapists. Results demonstrated large regional variability possibly due to differences in service delivery or data collection. The impact of this reported data on funding, workloads, interpretation of research, and personnel issues is discussed.

The United States Department of Education (2005), Office of Special Education Programs (OSEP), collects data nation wide on the number of children with disabilities and the number of service providers meeting their needs in the educational system. These data are analyzed and used by federal and state government agencies to set policy, determine personnel needs,

and provide financial support to individual states to meet the educational needs of children with disabilities (OSEP, 2004a). Limited research exists that has investigated how many children receiving special education services also receive related services and what type of related services (e.g., occupational therapy [OT], physical therapy [PT]) are provided (Muller & Tschantz, 2002). The purpose of this investigation was to reanalyze the data available from the OSEP to determine state and regional ratios of PTs and OTs to children with disabilities frequently served by therapists. This information could be valuable for developing models of service delivery, evaluating efficiency of service delivery, projecting personnel needs, providing support for therapist training programs, evaluating outcomes of research done in different regions of the nation, and increasing the awareness of need for related services and related service personnel in individual states.

Muller and Tschantz (2002) surveyed state education agencies (SEA) to determine whether the agencies collected state data on related services, including OT and PT. Thirty-three of 47 respondents collected data on related services; 30 of them collected data on the number of children receiving OT and PT. Twenty-eight of the SEAs collected data on OT and PT personnel vacancies. The authors concluded that although not all SEAs collect data on related services, "it is nonetheless significant that so any states and non-state jurisdictions believe it is important to collect data on this aspect of service delivery to students with disabilities" (Muller & Tschantz, 2002, p. 7).

Each year states are responsible for collecting data on their students with disabilities and the personnel who provide their services (OSEP, 2004b). Data collection began in the 1976–77 school year, and has undergone many changes since that time, including: increased number and variety of disability categories reported, initiation of reporting race/ethnicity data, and wider age ranges reported (OSEP, 2004a). Data on OTs and PTs working with children receiving special education services have been collected since 1976, although changes in reporting categories of personnel (e.g., fully certified versus not full certified) have occurred (OSEP, 2004c).

The OSEP reports the current student data, referred to as "Child Count," in two age groups of children receiving Part B services, 3 to 5 years-old and 6 to 21 years-old. These data are further categorized by type of disability and child's ethnicity (OSEP, 2003a; 2004b). For this investigation, only the total number of children from the following six diagnostic groups was analyzed: *multiple disabilities, orthopedic impairment, traumatic brain injury, autism, developmental delay and mental retardation.* These categories were chosen because they were the disability groups primarily served by both OTs and PTs. The number of children listed under the other eight federal categories (*deaf-blind-*

ness, deafness, hearing impairment, other health impairment, serious emotional disturbance, specific learning disability, speech and language impairment and visual impairment) were not included because: 1) while children in these categories might receive OT or PT services, the majority probably do not receive these services; 2) there are very large numbers of children in some of these categories which would suggest that therapists are serving totally unrealistic numbers of children when reported by ratios; and 3) there is wide variability in how states determine eligibility for these categories (OSEP, 2004c) which would increase the likelihood of an inaccurate reflection of numbers served and regional variation.

When the reporting procedures utilized by individual states differed from those set forth by OSEP (2004a), states must report the differences and provide the rationale for them (OSEP, 2003a). Inconsistencies in reporting can lead to a large variation in numbers of children per diagnostic groups among the states. For instance, many states collect data in a diagnostic group titled "other health impairments," however, Colorado and Delaware do not recognize this category, instead placing children who meet the conditions for this diagnosis in the "orthopedic impairment" category. Several states (Delaware, Florida, Georgia, North Dakota, Oregon, West Virginia, and Wisconsin) do not report "multiple disabilities," instead reporting children under a primary disability category. New York does not use disability categories for 3 to 5 year-old children, instead placing all 55,588 children into the "developmental delay" category, in contrast to California which has zero children in the "developmental delay" category (OSEP, 2003b; 2003c).

The states' personnel data are categorized by age group of students served, therapists employment classification (i.e. fully-certified and not fully-certified), and type of personnel (OSEP, 2004c). Both full-time and part-time employees are reported; however, part-time employees are reported in terms of full-time equivalency (i.e. an employee who works 4 hours in an 8 hour day is considered a .50 FTE). Data are included on the number of OTs and PTs who were employed or contracted to provide related services under Part B. Fully-certified refers to "personnel employed or contracted to provide special education and related services who had appropriate State certification or licensure for their position" (OSEP, 2004c, p. 2). To legally practice in any setting, PTs must pass an examination and obtain a license in the state in which they will practice as must OTs in 46 states. Indiana has certification laws governing OT; Hawaii, and Michigan have registration laws; and Colorado, has a trademark law.

METHOD

The 2002–2003 data set available from OSEP for Part B Educational Environment and Part B Personnel was analyzed using Microsoft Excel (OSEP 2003c; 2004d). Data from children ages 3 to 5 years and children ages 6 to 21 years were combined (OSEP, 2003c). A ratio was calculated of the number of children in the six selected disability categories to the number of therapists in each state (see Table 1) and nine national regions based on those described by the US Census Bureau (US Census Bureau, n.d.) (see Table 2).

There were a combined total of 1,266,222 children with disabilities in the six categories commonly served by PTs and OTs: *multiple disabilities (138,443)*, *orthopedic impairment (83,094)*, *traumatic brain injury (22,346)*, *autism (139,965)*, *developmental delay (283,209)*, and *mental retardation (602,165)*. Children listed under the other eight federal categories were not included for the reasons already noted. The data indicated 13,738 OTs and 6,781 PTs were employed by school systems across the nation. Connecticut and the District of Columbia did not report any employed therapists and their data were not included in the tabulations.

RESULTS

In every state there is clearly a higher number of OTs and a higher ratio of OTs to children with disabilities than PTs (see Table 1). Nationwide the average ratio of OTs to children with six specific disabilities is 1:184 and the average ratio of PTs is 1:503. New Hampshire (1:18), Wyoming (1:28) and New York (1:42) had the highest ratio of OTs, meaning the largest number of therapists were available to serve children with disabilities. The same states had the highest ratio of PTs, with New Hampshire's ratio being 1:61, Wyoming's was 1:71, and New York's was 1:76. The states with the largest number of children to therapists (lowest ratios), based on the reported data, were in Mississippi (1:2,352 OT and 1:11,762 PT) and Delaware (1:816 OT and 1:1,224 PT).

There were vast regional variations in the ratios of OTs and PTs (see Table 2 and Figures 1 and 2). Overall the Mid Atlantic region (1:52 OT and 1:91 PT) and New England region (1:65 OT and 1:170 PT) had the highest ratios of therapists. The regions with the lowest ratios were the East South Central (1:247 OT and 1: 403 PT), and Pacific states (1:107 OT and 1:374 PT).

TABLE 1.
Rank Order[a] from Least Children per Therapist to Most

States	# of OTs	# of PTs	Total # of Children[b]	Ratio OT:Children	Ratio PT:Children
Connecticut	Not reported	Not reported	12082		
Washington, D.C.	Not reported	Not reported	2604		
New Hampshire	207	62	3793	1:18	1:61
Wyoming	51	20	1412	1:28	1:71
New York	2457	1364	103893	1:42	1:76
New Mexico	222	107	8896	1:40	1:83
Rhode Island	78	40	3424	1:44	1:86
Maine	198	72	6965	1:35	1:97
South Dakota	61	50	3681	1:60	1:74
Wisconsin	424	233	20197	1:48	1:87
North Dakota	39	23	2107	1:54	1:92
New Jersey	853	486	49159	1:58	1:101
Illinois	828	359	46442	1:56	1:129
Arizona	410	136	20161	1:49	1:148
Maryland	311	153	20198	1:65	1:132
Montana	25	18	2114	1:85	1:117
Minnesota	483	155	24524	1:51	1:158
Pennsylvania	591	369	48562	1:82	1:132
Kansas	177	73	12645	1:71	1:173
Washington	415	157	27940	1:67	1:178
Oregon	129	74	11629	1:90	1:157
Massachusetts	520	208	37647	1:72	1:181
Alaska	41	18	3241	1:79	1:180
Nevada	74	38	6849	1:93	1:180
Michigan	489	277	53717	1:110	1:194
Virginia	260	185	33,934	1:131	1:183
Arkansas	152	105	19837	1:131	1:189
Vermont	37	14	3371	1:91	1:241
Texas	427	218	52294	1:122	1:240
Florida	529	249	63914	1:121	1:257
South Carolina	123	77	18499	1:150	1:240

(Continued on next page)

TABLE 1. *(continued)*
Rank Order[a] from Least Children per Therapist to Most

States	# of OTs	# of PTs	Total # of Children[b]	Ratio OT:Children	Ratio PT:Children
Oklahoma	112	93	20421	1:182	1:220
Tennessee	134	101	24363	1:182	1:241
Colorado	254	76	19433	1:177	1:256
Missouri	234	80	26149	1:112	1:327
Indiana	186	116	34212	1:184	1:295
Ohio	438	271	81174	1:185	1:300
North Carolina	270	156	48162	1:178	1:309
Iowa	82	52	15727	1:192	1:302
Louisiana	139	73	23,903	1:172	1:327
Hawaii	37	16	5855	1:158	1:366
West Virginia	55	39	12099	1:220	1:310
Utah	47	30	10284	1:219	1:343
Kentucky	184	93	37764	1:205	1:406
Georgia	204	81	40945	1:201	1:505
Alabama	67	44	22487	1:336	1:511
Nebraska	28	14	8749	1:313	1:625
California	626	93	85357	1:136	1:918
Idaho	19	8	6749	1:355	1:844
Delaware	6	4	4896	1:816	1:1224
Mississippi	5	1	11762	1:2352	1:11762
Total Average for all States				1:184	1:503
Standard Deviation				341	1658

[a] Rank ordering was based on combined total children served by OTs and PTs.

[b] Children from the following six categories: *multiple disabilities, orthopedic impairment, traumatic brain injury, autism, developmental delay,* and *mental retardation.*

DISCUSSION

As anticipated there were larger numbers of OTs than PTs in every state. The American Occupational Therapy Association (AOTA) indicates that 66%

TABLE 2.
Regional[a] IDEA Data[b] Rank Ordered from Least Children per Therapist to Most

Regions	Children Served	Ratio OT : Children	Ratio PT : Children
Mid Atlantic: *NY, PA, NJ*	201614	1:52	1:91
New England: *ME, VT, NH, MA, CT, RI*	67282	1:65	1:170
Mountain: *MT, ID, WY, NV, UT, CO, AZ, NM*	75898	1:69	1:175
East North Central: *WI, IL, IN, OH, MI*	235742	1:100	1:188
West North Central: *ND, MN, SD, IA, NE, KS, MO*	93582	1:85	1:209
West South Central: *OK, AR, TX, LA*	116455	1:140	1:238
South Atlantic: *MD, DE, DC, VA, WV, NC, SC, FL, GA*	245251	1:140	1:260
Pacific: *WA, OR, CA, AK, HI*	134022	1:107	1:374
East South Central: *KY, TN, MS, AL*	96376	1:247	1:403

[a] Regional divisions of the US Census Bureau

[b] Listed from lowest ratio of children to therapists (meaning larger concentration of therapists to children) to the highest ratio based on combined total of children served by OTs and Pts.

of members identify early intervention or school settings as either their primary or secondary work setting in 2000 and 34.4% in 2003 (AOTA, 2000, 2003), where as the American Physical Therapy Association (APTA) reports that 5% of its membership worked in schools in 1999 and 2000, 3.2 % in 2002, and 4.4% in 2005 (APTA, 2005). Approximately 40% of PTs are members of the APTA (Kevin Cooleen, APTA, personal communication, March 5, 2007), so this is probably a low estimate of the true national percentage of PTs working in schools.

An unexpected finding was the vast difference in ratios of therapists in the different regions of the nation. Whereas some individual state variation might reflect data collection and reporting methods, the large regional variation is probably a realistic reflection of proportions of therapists and offers a

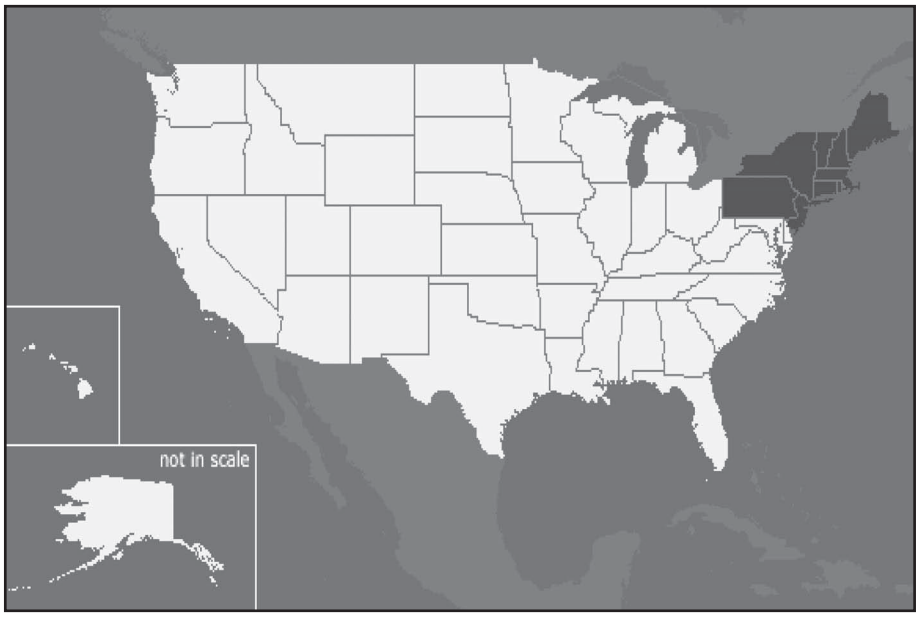

Figure 1.

Regions with lowest (best) ratio children to PTs and OTs: 1st Mid Atlantic and 2nd New England.

truer reflection of service delivery. It is unlikely that children with disabilities in the West and South had less need for therapy services to meet their educational needs than children in other regions. It is also unlikely that therapists in the West and South were more efficient in their interventions.

The reason for these geographic differences needs to be determined. Possibly, the differences could be accounted for by disparities in service delivery models across regions. Traditionally, therapists have been trained to use direct service models; however, there is limited research on outcomes related to types of service delivery and whether more therapy services mean better outcomes for the student. Dreiling and Bundy (2003) and Davies and Gavin (1994) found that consultation was equally effective to direct OT intervention for preschool children with motor delays. Kaminker, Chiarello, O'Neil and Dichter (2004) explored PT service delivery recommendations and found that the majority of therapists favored direct services (i.e. individual or group intervention) over indirect services (i.e. consultation and monitoring). Further analysis of this data indicated that PTs in the northeast recommend more treatment than those in other regions (Kaminker, Chiarello, & Smith,

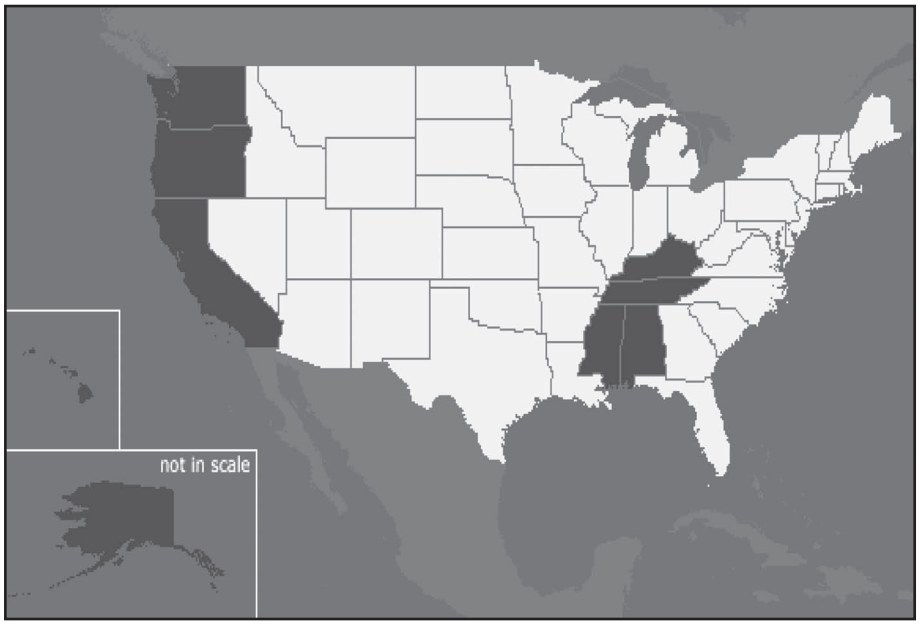

Figure 2.

Regions with highest (worst) ratio of children to PTs and OTs: 8th Pacific and 9th East South Central.

2006). Presumably, if therapists are providing more direct treatment than consultation, more therapists would be needed to provide services.

In the past, vacant therapy positions may have accounted for some of the regional variations. In the 1980's and early 1990's there were shortages of OTs and PTs in many areas of the country (United States Department of Education, Office of Special Education and Rehabilitative Services, 1994). More recently, the Study of Personnel Needs in Special Education (SPeNSE) completed by the independent research corporation, Westat, addressed nationwide shortages of personnel serving students with disabilities. The Westat report suggests that personnel shortages and barriers to recruitment may not only be affected by region, but also by the amount of poverty in an area, district size, and metropolitan status (Westat, 2002a, 2002b, 2002c, 2002d, 2002e, 2002g, 2002h). In their survey of school district administrators from across the nation, the Southeast and Great Lakes regions were described to a great extent as having distinct barriers to recruiting OTs and PTs (Westat, 2002d, 2002h). Specifically, insufficient salary was cited as a barrier for recruitment in both disciplines. Districts that had both the wealthiest

and the poorest students had difficulty recruiting OTs and PTs; ability to offer a sufficient salary and benefits were described as barriers (Westat, 2002b, 2002f). Only the smallest districts did not describe barriers in the recruitment of qualified personnel (Westat, 2002c, 2002g), however, these same small districts reported the largest number of job openings even when compared with large districts (Westat, 2002i). In terms of metropolitan status, almost half of all districts (rural, urban, and suburban) stated that the shortage of qualified applicants was a barrier to recruiting PTs and OTs (Westat, 2002a, 2002e). These issues highlight the need for improved documentation and reporting of related services personnel.

Another possibility for the regional variations is that many therapists working in public schools are not employed by the school districts, but instead work through agencies which contract with the districts or they are self employed and contract directly with the school system. Contract therapists were to be included in the OSEP personnel count; however, perhaps in some states they were omitted. Various nationwide surveys of the PTs who were members of the APTA Section on Pediatrics found 31% (Effgen, 2000), 57% (Effgen & Klepper, 1994) and 62% (Kaminker et al., 2004) were hired full or part time directly by the school system; the remaining PTs were either contracted to the school by an outside agency or were self-employed and contracted to the school (Effgen, 2000; Kaminker et al., 2004). In a recent survey of OTs working in school settings, 66.6% reported being employed by a school district and 10.7% reported working as a private contractor, with the rest employed by a public/government agency, private agency, or other type of arrangement (Holtzinger & Hight, 2005).

OSEP cites reasons for personnel data changes from 2002 to 2003: alterations in data collection systems, inclusion of private facilities that provide special education services, clarification of personnel classification definitions and failure of some schools to provide data (OSEP, 2003b). The National Education Association also notes that services under IDEA are drastically under funded (2002). These issues may be part of reason for the wide variation among regions.

The data should reflect the proportion of therapists to children; however, for some states, the data might be inaccurate, such as in Mississippi and Delaware where there is a tremendous number of children with disabilities and a very small number of therapists. There is no way to determine the accuracy of this government data. More detailed criteria should be established for states to use in their data collection procedures to better insure the accuracy of the data and allow for more precise comparisons. Possible ways to improve data collection include: making OSEP's reporting requirements mandatory

for all states, revising the data collection forms to ensure inclusion of all personnel who work with students, and penalties for school districts that fail to report. Therapists should also make an effort to review their state data to determine if it is generally accurate.

This wide variability in ratios of children with specific disabilities to OTs and PTs across the nation suggests that children are apparently receiving vastly different levels of related services in schools. Some therapists are perhaps overburdened and might not be providing appropriate and adequate services. Or perhaps they are providing mainly indirect services and other related service providers, teachers, and parents are providing the direct intervention. Kaminker and colleagues (2004) found that the mean number of children served per week by the PTs was 16 direct/individual, 5 indirect/group, 5 monitored and 7 consultation. In a survey by Rainville et al. (1996), OTs reported participating in evaluation and direct service with students 64% of the time, and supervision, consultation, and training only 18% of the time. Some state education agencies recognize the importance of collecting service delivery data. As reported by Muller and Tschantz (2002), 13 of 47 agencies collect information on the amount of related services provided based on what was written on the IEP and one agency collected data on amounts of direct and indirect services. There is, however, very little published data on the case loads or workloads of therapists in school systems and what constitutes an appropriate case load or workload, despite discussion on this topic in many informal settings, conferences, and as part of unpublished documents.

Having a general idea of regional variations in the number of children served by therapists also has important implications for interpreting research studies. Our analysis and the findings of Kaminker and colleagues (2006) suggest that children in the northeastern United States probably receive more therapy than children in other parts of the nation. Outcomes of studies from the northeast might have to be interpreted differently from studies from the south central region of the country.

LIMITATIONS

Reporting procedures utilized by individual states can differ. These inconsistencies in reporting can lead to large variations in numbers of children per diagnostic group among the states as already noted. However, by combining children from multiple categories, some of the individual state variations in reporting categories of disability should be avoided. The accuracy of some states' personnel data are a concern. Connecticut and the District of Columbia report having no therapists, which is certainly not correct.

Delaware contracts large number of therapists and they apparently were not reported. Under reporting of contracted therapists is highly likely throughout the nation.

The ratios are an indirect measure of potential caseloads and certainly not all children in the six categories included require OT and PT. Having exact numbers of children served by therapists would be far more useful and accurate way of determining caseloads and regional variations.

CONCLUSIONS

The ratio of children with specific disabilities to OTs and PTs in schools varies greatly across the nation. Nationwide the average ratio of OTs to children with six specific disabilities is 1:184 and the average ratio of PTs is 1:503. New Hampshire, Wyoming, and New York had the highest ratios of both OTs and PTs. The poorest ratios of therapists to children based on the reported government data were in Mississippi and Delaware. Children are apparently receiving vastly different levels of related services in schools. Some therapists are perhaps overburdened and might not be providing appropriate services. These regional variations are important to be aware of when reviewing and evaluating research done in different regions of the county. Vastly different caseloads will influence outcomes of studies. There are also probably problems with the mechanisms for reporting child and personnel data. Since funding for services under IDEA is already inadequate, it is imperative that accurate data be collected. Correct data can assist in shaping best practices for OTs and PTs working in schools and assist personnel preparation programs in realistic program planning.

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