

# Health and Special Education: A Study of New Developments for Handicapped Children in Five Metropolitan Communities

JUDITH S. PALFREY, MD  
JUDITH D. SINGER, PhD  
DEBORAH K. WALKER, EdD  
JOHN A. BUTLER, EdD

Dr. Palfrey is Chief of Ambulatory Pediatrics at the Children's Hospital, Boston, and Assistant Professor of Pediatrics at Harvard Medical School. Dr. Singer is Assistant Professor of Education at the Harvard Graduate School of Education. Dr. Walker is Associate Professor of Human Development at the Harvard School of Public Health. Dr. Butler is Assistant Professor at the Department of Social Medicine and Health Policy, Harvard Medical School.

Tearsheet requests to Dr. Judith Palfrey, 300 Longwood Ave., Boston, MA 02115.

This report presents information from the Collaborative Study of Children with Special Needs. The study was supported by grants from the Robert Wood Johnson Foundation and the Commonwealth Fund.

## Synopsis .....

*Since the implementation in 1977 of the Education for All Handicapped Children Act (Public Law 94-142), public school systems have provided*

*special education and related services to students with a wide range of handicapping conditions, including some children served previously in hospitals or other institutions. Although the Federal law does not require physician participation in the special education process, it does imply an active new role for the medical care community, both public and private, in helping schools to identify and diagnose children with disabilities and in ensuring that those children have adequate access to health services.*

*This study explores the experience of five nationally dispersed urban school systems in implementing P. L. 94-142, with particular reference to the interaction of physicians and the schools. The findings highlight continued problems with early identification of certain types of childhood handicaps, classification of children's functional disorders, and adequate participation of practicing physicians in the program, especially with regard to developmental and behavioral issues. In addition, inequities in community health services are documented for a substantial number of the children studied. Improved collaboration between the health and education sectors is needed to address these concerns in order to fulfill the intent of national special education policy and to maximize the potentialities of these children and their families.*

**I**N 1977 THE EDUCATION FOR ALL HANDICAPPED Children Act (Public Law 94-142) was implemented nationally, requiring the public schools to institute a variety of new procedures with respect to the identification, evaluation, classroom placement, and individualized curricular planning for students with a wide range of physical and mental disabilities (1). The law was intended to assure every handicapped child a "free appropriate public education" in the least restrictive environment consistent with the child's needs (2-4). The public schools were to provide instructional services tailored to the learning capabilities of each youngster regardless of the severity of disability and to provide any "related services," including health-related services, deemed prerequisite to participation in school (5-6). Since 1977, the total number of children in special education programs has grown to more than 4 million nationwide, or

almost 11 percent of the elementary and secondary school population. They include a significant number of children with conditions so severe that they previously would have been at home or in institutions rather than in public schools (7).

Seven years after the law was implemented, much is known about its school-related impact. The Federal Office of Special Education and Rehabilitation Services has published annual compliance reports to Congress which document the numbers of children served, types of disability, and settings where service is provided. (7). Various small scale studies also have assessed the degree of compliance with procedural guarantees to parents (8), the dynamics of placement decisions (9), and the impact of particular educational settings on selected disability groups (10). In general, these studies show that school systems have responded actively to the regulations by recruiting and train-

### Statistical Note

The stratified random selection technique necessitates the use of specialized formulas for calculating standard errors of estimates. The general equation for calculating the approximate standard error of a percentage is

$$SE(p) = c \sqrt{p(1-p) \div n}$$

where

$p$  = the percentage for which the standard error is to be calculated;

$SE(p)$  = the approximate standard error of  $p$ ;  
 $c$  = a correction factor that accounts for the stratified design; and

$n$  = the unweighted number of respondents in the group for which the percentage is calculated (17).

Values of  $c$  and  $n$  for groups within which many of the percentages presented in this paper are calculated are given in the first two columns of table 1. These values were incorporated into the formula given previously to yield approximate standard errors for percentages of 50 percent, 10 percent, and 90 percent; (10 and 90 percent have identical standard errors) as presented in the remaining columns of the table. When percentages are based on different groups, a conservative strategy is to use the observed group size in conjunction with the largest value of  $c$ .

Table 1. Estimated standard errors (SE) of percents

Primary handicapping condition as per school	$n$	$c$	SE	SE
			(50 percent)	(10 percent or SE (90 percent))
Speech.....	246	1.07	3.40	2.05
Learning.....	377	1.03	2.64	1.59
Emotional...	206	1.09	3.76	2.27
Mental.....	403	1.05	2.62	1.57
Hearing.....	187	1.06	3.87	2.33
Vision.....	44	1.26	9.52	5.70
Physical, multiple.....	263	1.21	3.72	2.23
Total..	1,726	1.36	1.62	0.98

ing new staff (11), by performing comprehensive evaluations (12), and by initiating programs to integrate handicapped children both educationally and socially (2,13).

While the detailed P. L. 94-142 regulations contain little explicit language about the role of medical care providers in facilitating the goals of the legislation, there has been the presumption that physicians would be among the consultants working directly with schools to further the intent of the law both for individual children and for the entire special education population. In contrast to the extensive studies of school services, few investigators have explored the contribution of the health sector to the new programs for children with handicaps (14-16). To understand more about the involvement of physicians and other health care providers in the new special education process, the Collaborative Study of Children with Special Needs investigated the experience of five of the nation's largest school systems as they attempted to meet the law's requirements. This paper presents data relating to the following questions:

1. Were there differences among school districts in the way disabilities were defined or classified, and what contribution did physicians make to the process of definition and diagnosis?
2. For how many special education students were medical factors relevant to day-to-day functioning and school performance?
3. How many special education students had a regular health care source and physician?
4. What medical or health-related services in addition to educational services were provided to special education students via the schools?
5. What was the extent and nature of communication between educational and medical professionals concerning students in various disability groups?

### Methods

The collaborative study was conducted in five large urban school systems, selected for geographic, socioeconomic, and ethnic diversity: Charlotte-Mecklenburg, NC; Houston, TX; Milwaukee, WI; Rochester, NY; and Santa Clara County, CA. The community-based design was chosen over a national probability study because such a design afforded the opportunity to obtain both nationally relevant information and detailed data on local health and special education policies.

**Sample.** The sample was drawn using a stratified random selection technique to ensure adequate numbers of children with more severe but less common problems (17). This method of sampling permits generalizations both for subgroups of children and for the special education population as a whole. In each site, the special education population of children ages 5 through 12 years was divided into three strata based upon the school's designation of primary handicapping condition: (a) those with speech impairments or learning disabilities, (b) those with emotional and behavioral problems or mental impairments, and (c) those with physical, sensory, or health impairments. An initial sample of 3,100 children was selected, divided approximately equally across the three strata and five sites.

From this initial sample, 273 children (8.8 percent) were ineligible to participate because they had moved out of the district, were no longer in special education, were siblings of others in the sample, or had died. Consent was granted for 2,048 (72.4 percent of the eligible sample), and from these a random sample of 1,726 was selected for the study. A comparison of the ineligible students with the remainder of the initial sample revealed that they were more likely to be speech impaired or learning disabled, but they did not differ significantly with regard to age, grade, sex, race, or ethnicity. A comparison of the refusing and consenting cases on these same measures revealed only one significant difference in one stratum and site, for which adjustment was made when sample weights were corrected.

**Measurement.** In the spring of 1983, parents were interviewed for 40 minutes by phone in either English or Spanish by personnel from the University of Illinois Survey Research Laboratory. Each child's school special education record was abstracted by a trained record reviewer. For one-half of the children, teacher interview data were also obtained.

The child's diagnosis was derived from the parent's report of the child's "major handicapping condition" augmented by yes-no answers on a checklist of common medical conditions (18,19). In addition, the school's diagnosis was obtained from data tapes supplied by the schools. Information on the child's functional status was recorded using questions which correspond to those regarding activity limitation in the 1983 National Health Interview Survey (18) ("Does the condition or problem affect the child's ability to do things all

*'Since 1977, the total number of children in special education programs has grown to more than 4 million nationwide, or almost 11 percent of the elementary and secondary school population. They include a significant number of children with conditions so severe that they previously would have been at home or in institutions rather than in public schools.'*

other children his age can do?") as well as a functional measurement scale (20) to assess mobility and activities of daily living.

For information regarding regular source of care and use of health services, questions from the National Health Interview Survey (18) and the National Survey of Access to Medical Care (21) were used. Socioeconomic information included the child's age, race, sex, family constellation, maternal and paternal education as well as a dollar amount for the family's total annual income. Based upon the income data, the family's standing relative to the 1982 poverty line was computed (22).

**Statistical analysis.** Estimates presented in this paper are based on a weighting procedure which compensates statistically for the oversampling of low-prevalence disability groups in the sample. Within each site, weights were computed to generalize the results to the special education population of that site. These weights were then calibrated to total the actual number of respondents in that site, so that cross-site estimates reflect an approximate average of the individual site results. Estimated standard errors of percentages (see Statistical Note) also were computed in order to take the sampling design into account.

The total sample size of 1,726 is large enough to provide ample statistical power (greater than .80) to detect small effects (23). Within subgroups power does diminish, but as shown in the Statistical Note, estimated standard errors remain relatively small (table 1).

**Constraints on inference.** Although each of the five samples provides a representative probability

Table 2. Characteristics of the special education and total student population of the five study sites, 1982-83 school year (percentages)

Characteristics	Charlotte, NC		Houston, TX		Milwaukee, WI		Rochester, NY		Santa Clara, CA	
	Special education	Total students	Special education	Total students	Special education	Total students	Special education	Total students	Special education	Total students
<b>Ethnicity:</b>										
Percent white . . . . .	142.8	56.9	22.6	18.9	38.7	38.1	38.2	36.9	59.5	58.1
Percent black . . . . .	56.7	40.6	44.1	42.9	52.9	50.5	51.3	49.0	5.0	4.3
Percent Hispanic . . . . .	0.1	0.0	32.6	35.0	5.6	7.5	9.6	11.3	29.5	26.6
Percent other . . . . .	0.4	2.0	0.7	3.4	2.8	3.8	0.9	2.5	6.1	11.6
Gender: percent male . . . . .	69.2	...	66.7	...	69.1	...	65.4	...	64.3	...
<b>Income: percent students with family income below 130 percent of the poverty line . . . . .</b>										
	38	33	37	41	45	50	252	40	18	23
<b>Kindergarten—grade 6: number enrolled . . . . .</b>										
	2,893	38,003	9,213	116,070	4,079	38,407	2,530	18,846	6,176	65,557
<b>Percent students in special education . . . . .</b>										
	7.6	...	7.9	...	10.6	...	13.4	...	9.4	...

<sup>1</sup> P < .001. <sup>2</sup> P < .05.

Table 3. Identification of child's primary handicapping condition, special education population, five study sites, 1982-83 school year

Primary handicapping condition	Number sample with condition <sup>1</sup>	Identified by—		
		Physician (percent)	Age 2 (percent)	Age 5 (percent)
Speech problem . . .	198	24.5	16.7	64.6
Learning problem . .	381	14.0	4.0	24.5
Other developmental problem . . . . .	131	19.2	3.8	32.8
Hyperactivity . . . . .	83	50.0	9.9	50.6
Emotional problem . .	138	35.0	7.4	43.0
Mental retardation . .	139	80.3	48.9	81.8
Down's syndrome . .	54	98.2	100.0	100.0
Hearing problem . . .	195	79.0	56.7	91.2
Vision problem . . . .	53	88.5	57.7	78.9
Cerebral palsy . . . .	121	97.5	94.8	99.1
Other neurological problem . . . . .	120	92.4	63.3	84.2
General medical . . .	110	94.5	63.9	86.1

<sup>1</sup> Actual numbers in sample. Does not reflect the relative proportion of the condition in the special education sample.

sample within that school district, their combined results cannot be expected to generalize to all school districts across the country. In particular, the focus on major metropolitan areas means that, at best, the findings may reflect national urban experience, but not small-city or rural experience. Also, because the data in the study are cross-sectional, direct causal inferences are not warranted. However, various statistically significant associations are described and, because this was a

large sample, it is possible to consider these associations from both the statistical and the practical point of view.

## Results

Table 2 shows selected background characteristics of the special education and total student populations of the five study sites. The percentage of children in special education ranged from 7.6 percent of the elementary school population in Charlotte to 13.4 percent in Rochester, as compared with the national average in the 1982-83 school year of 10.7 percent (7). Except in Charlotte, the proportion of minority students in special education was comparable to their proportion in the larger school population. Males constituted approximately two-thirds of the special education group at every site, although further analysis revealed that overrepresentation of boys was found primarily among children classified by the schools as speech-impaired, learning disabled, emotionally disturbed, or mentally retarded. Except in Rochester, special education students had average family incomes approximately equal to families of the general school population. Families at four of the five sites had an average income below the national mean (22).

**Classification of handicapping conditions.** School system information on the children's primary disability was coded, using uniform Federal reporting categories. When pooled across all sites, the

distribution of disabilities for special education students generally conformed to the national pattern (7), with children classified as speech impaired constituting 31.3 percent, those with learning disabilities 44.3 percent, those with mental impairment 11.6 percent, and those with emotional and behavioral problems 8.0 percent. Other primary handicaps were much less common (sensory, 2.2 percent; physical, multiple, or other health impairments, 2.6 percent).

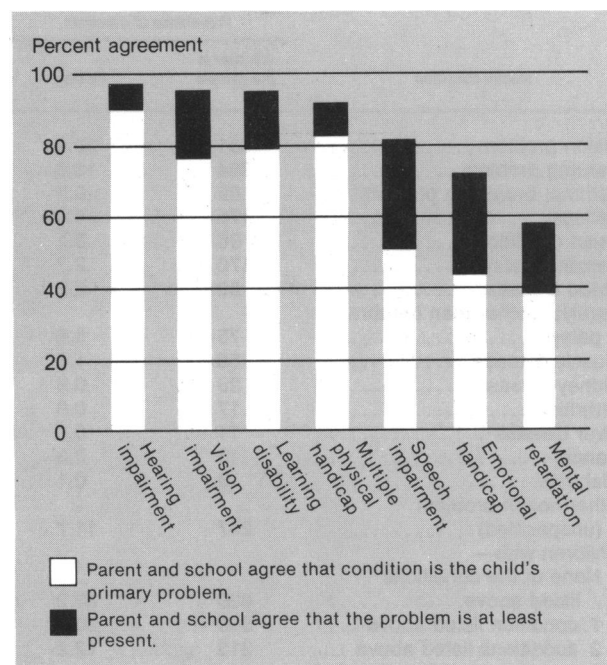
Between-site variations in reported prevalence were considerable, especially for those disability classifications not characterized by clear physical symptoms and etiology. For example, the proportion of special education students classified as learning disabled varied from 31.2 to 58.1 percent among sites. For emotional disturbance the range was 2.7 to 15.7 percent, and for mental retardation it was 6.4 to 15.9 percent.

Differences were also found between the school's and parent's classifications of primary handicap. Figure 1 displays the percent of students in each of the school classification groups whose parents agreed that the school's designation represented the child's primary problem (base of bars) or at least agreed that the child had a problem in that area (top of bars). Congruence was greatest for low-prevalence disabilities with a clear organic base. Parents were least likely to agree with the school about the child's handicap when the school classified the child as mentally retarded, emotionally disturbed, or speech impaired.

Seventy-five percent of the special education students in these five districts had more than one disability, and 27.5 percent had more than three. However, since multiple disabilities tended to cluster in the high-severity, low-prevalence classifications, it would be difficult to argue that this factor explained the pattern of parent-school disagreement.

Also within any given school classification, there was substantial variation in the number of associated medical conditions and the degree of functional limitation the children had. For example, among children categorized by both parents and school as "mentally retarded," there was a wide range of physical disability: 40 percent of the children had no associated medical problems, 46 percent had one, and 14 percent had two or more. Functional ability also varied widely, with slightly more than half the children manifesting feeding and dressing problems. In every other disability area, similar functional heterogeneity was masked by the limited options for school classification.

Figure 1. Parent agreement with the school's classification of the child's primary handicap, special education population, five study sites, 1982-83 school year



As indicated in table 3, physicians were more involved in the diagnostic process for physical and sensory disabilities than for development-behavioral problems. Physicians tended to make the first diagnosis of cerebral palsy, Down's syndrome, neurological, and other medical conditions as well as mental retardation, whereas schools' staff tended to diagnose speech, learning, and other developmental problems. Physicians diagnosed approximately one-third of the behavioral and emotional problems. Moreover, the definition of physical and sensory problems tended to occur well before school entry, while developmental and behavioral problems were often not classified as "disabilities" until school entry. In this data set, a substantial group of children (20 percent) were not defined as "mentally retarded" until they began their formal educational program.

**Medical conditions.** Although the vast majority of children in special education are reported to be in good physical health, associated health conditions remain common for children with handicaps, and a subpopulation have very serious health problems. Table 4 displays the parents' reports of selected medical conditions among students in this survey, and the parent's judgment regarding activity limitation. Parents were free to list more than one

Table 4. Prevalence and functional effects of selected medical conditions, special education population, five study sites, 1982-83 school year

Health condition	Prevalence of condition		Of those children with condition, percent reporting—			
	Number in the sample	Percent <sup>1</sup>	Functional limitation	Physician visits <sup>2</sup>	Specialist visits <sup>2</sup>	Hospitalization <sup>2</sup>
Vision problem.....	451	20.6	34.7	69.0	26.4	8.4
Hearing problem.....	394	13.6	42.9	68.4	19.6	7.2
Asthma, breathing problem...	182	9.9	44.0	76.6	24.9	19.3
Epilepsy.....	175	4.9	56.9	75.2	41.6	28.5
Heart condition.....	96	3.1	20.5	79.4	26.7	13.8
Cerebral palsy.....	170	2.7	91.5	85.8	49.2	23.7
Blood disease.....	50	2.3	20.9	70.9	13.0	19.7
Paralysis other than cerebral palsy.....	75	1.6	75.9	68.3	46.4	29.6
Muscle disease.....	58	1.3	71.5	76.1	25.9	6.0
Kidney disease.....	29	0.8	51.4	75.5	34.0	34.1
Arthritis.....	17	0.6	48.2	67.5	24.0	10.4
Liver disease.....	11	0.5	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Cancer.....	13	0.3	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Diabetes.....	3	0.1	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Other health problem (unspecified).....	247	11.7	( <sup>4</sup> )	81.3	30.5	16.0
Children with—						
None of the conditions listed above.....	625	52.2	0	53.9	6.7	3.1
1 condition listed above...	569	30.0	22.8	67.0	18.1	8.0
2 conditions listed above..	313	12.2	62.0	72.0	26.7	12.0
3 or more conditions listed above.....	219	5.6	86.6	87.7	43.6	24.9

<sup>1</sup> Indicates the estimated prevalence weighting the cases appropriately. These are not percentages of 1,726.

<sup>2</sup> Within the past year.

<sup>3</sup> Sample size too small to produce stable estimates.

<sup>4</sup> Question not asked.

condition, so the table also includes summary data for those reporting none, one, two, and three or more conditions.

Overall, 47.8 percent of special education students were reported to have at least one health condition and 17.8 percent were reported to have more than one. The most prevalent were vision problems, hearing problems, and asthma or other breathing disorders. Prevalence estimates for the special education population may not correspond precisely to estimates for the entire chronically ill and handicapped school population in these communities because some children with chronic illnesses are able to perform independently in school without being designated educationally handicapped. Activity limitation varied greatly, but was most frequent among children with cerebral palsy, other forms of paralysis, and muscle disorders.

Table 4 also provides information on the relationship between the number of medical conditions and several indicators of demand for health services: frequency of physician visits, specialty care visits, and inpatient hospital stays in the past year. The 18 percent of special education children with two or more health conditions had more than four times the rate of hospitalization of the

children with no health conditions. Those with cerebral palsy, other types of paralysis, epilepsy, or kidney disease showed the most intensive demand for services.

**Regular care sources and physicians.** In numerous studies, the parents' ability to identify a regular source of care has been shown to be a strong correlate of appropriate and timely health care use (24). The presence of a regular care source was reported in this survey approximately as frequently as in the larger United States child population of comparable age. In the aggregate, 92.6 percent of the special education students had such a source, as compared to 92.3 percent of a national probability sample of all children ages 5 to 13 (25).

However, proportions of children with no regular source varied from 2.1 to 15.4 percent among the five communities studied. Sites reporting the highest proportions of children with a regular care source were those that were either most affluent or else had the broadest eligibility criteria for Aid to Families with Dependent Children and Medicaid and the most ample infrastructure of public clinics and neighborhood health centers. For example, although families in Rochester were significantly

poorer than families in Santa Clara County, Rochester showed a comparably high proportion of children with a regular care source (97.6 percent as against 97.9 percent in Santa Clara County).

Overall, 74.3 percent of the parents identified specific physicians as regular health care providers. Sixty-nine percent of the regular providers were pediatricians, 25.0 percent were general or family practitioners, and 8.3 percent were specialists.

When the sample was examined by disability category, significant variation was found in the likelihood of the children having a regular care source, a specific physician, and of that physician being a specialist. Table 5 contrasts children in two disability clusters with regard to their health care pattern. Children with speech, learning, other developmental, hyperactivity, or emotional problems ("high prevalence" cluster), were compared with children with Down's syndrome, deafness, vision problems, cerebral palsy, other neurological problems, or general medical problems ("low prevalence" cluster). Those in the high prevalence cluster were less likely to have a regular care source, regular physician, or specialist as regular physician, suggesting that an underlying bimodal pattern of access to care is masked when data on all special education students are pooled. The pattern of the high prevalence cluster is probably quite typical of the health care pattern for the nonspecial education students in these communities as well, although in the absence of within-site nonhandicapped controls, this suggestion remains only a reasonable hypothesis.

Rates of physician visits varied significantly between the two condition clusters (for example, 58.9 percent of the former group had seen a physician in the past year, and 78.1 percent of the latter). Physician visit rates were also strongly associated with the child's background characteristics including race, ethnicity, family income, and maternal education. The relative contribution of these factors in predicting medical care use will be the topic of a subsequent article.

**Related services.** Health-related therapies are perceived as an integral component of the education program for many children with disabilities. In the five communities studied, speech therapy was widely available, being provided primarily to children with hearing impairments (81.9 percent), speech disorders (84.7 percent), Down's syndrome (90.0 percent), and other forms of mental retardation (63.1 percent). Physical and occupational therapy were targeted more closely to particular

Table 5. Percent of parents responding yes to questions on access to and use of health care in selected disability groups, special education population, five study sites, 1982-83 school year

Health care measure	High prevalence cluster <sup>1</sup> (N = 931)	Low prevalence cluster <sup>2</sup> (N = 663)
Regular source of care . . . .	91.8	97.5
Regular physician . . . . .	71.6	87.3
Regular physician is a specialist . . . . .	3.2	21.6
Physician visit in last year . . .	58.9	78.1
Specialty care visit in last year . . . . .	11.0	34.9

<sup>1</sup> Includes children whose primary handicap as reported by the parent is speech, learning or other developmental problems, attention deficit disorder, or emotional difficulties.

<sup>2</sup> Includes children whose primary handicap as reported by the parent is Down's syndrome, hearing or vision problems, cerebral palsy, other neurological problems, or general medical conditions.

NOTE: All differences between clusters are significant at the  $P < .01$  level. 139 children with mental retardation were excluded, as were 3 children with no diagnosis available.

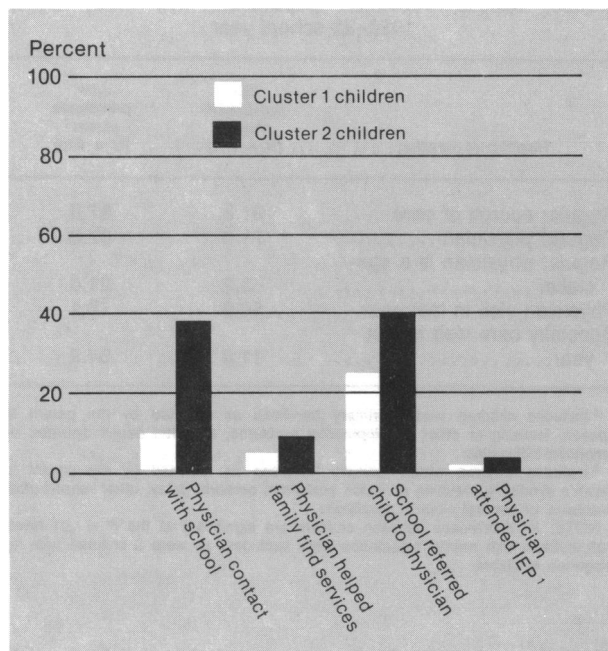
disability groups; 81.0 percent of the children with cerebral palsy had PT/OT as did 40.5 percent of those with other neurological conditions, but only 33.0 percent of those with Down's syndrome and 22.1 percent of children with a chronic illness or other medical condition.

Child counseling was reported by one-third of parents overall, and two-thirds of those whose children were classified as emotionally or behaviorally disturbed. Psychiatric services were offered to 17 percent of the emotionally disturbed students.

School and health department funds paid the entire bill for speech, physical, and occupational therapy for 89.8 percent of the children. Parents rarely paid for these services, leaving public programs and third party sources such as Blue Cross-Blue Shield, commercial insurers, and Medicaid to pay the balance. All costs of student transportation were paid by the schools.

**Physicians' communication with the schools.** An unwritten goal of P. L. 94-142 has been increased communication between physicians and the schools. This study included several indicators of the degree of physician involvement in the special education process: parents' reports that the child's physician had made contact with the school staff, that their physician had helped them find appropriate services, that a referral for health care had been made by the school, and evidence that a physician had contributed to the evaluation conference prior to class placement.

Figure 2. Physicians' involvement with the schools, special education population, five study sites, 1982-83 school year



<sup>1</sup> IEP: individualized education plan.

NOTE: Primary handicap of cluster 1 children, as reported by parents, is speech, learning, or other developmental problems, attention deficit disorder, or emotional difficulties. Primary handicap of cluster 2 children, as reported by parents, is Down's syndrome, hearing or vision problems, cerebral palsy, other neurological problems, or general medical conditions.

Overall, for only 13.8 percent of all special education students was there any report of a physician's contact with the school. However, contrasts on this measure between the two disability clusters previously displayed in table 5 were substantial, with 9.0 percent of those in the "high prevalence" cluster and 38.3 percent in the "low prevalence" cluster reporting such contact (figure 2). A similar pattern was noted on the referral indicators. Specialists tended to be in communication with the schools more than primary care physicians, suggesting that discussion may have centered on specific aspects of the child's disorder. Specialists also may be surrogate primary care providers for many of these children.

Only in rare cases (1.8 percent) did a physician attend the conference to draw up the child's individualized education plan (IEP), a document mandated under the Federal law. Also, medical examinations were performed as a part of these evaluations much less frequently than were academic and psychological assessments. Sixteen percent of the IEPs were formulated with the benefit of a recent physical examination. Such an assessment was most likely for children with mental

retardation, neurological, or general medical conditions. Sensory evaluations were available as a basis for deliberation in 41.7 percent of cases. Physical and occupational therapy examinations were performed almost exclusively on children with cerebral palsy and other neurological disorders (43.5 percent), general medical conditions (22.0 percent), and mental retardation (21.4 percent). Thirty-two percent received psychiatric or social service workups, or both.

An indication of the need for greater physician contact with the schools was the limited knowledge professed by teachers about the children's medical status. Among teachers of the 12.3 percent of children routinely on medication, 51.7 percent said they understood the long-term health consequences of the child's disability. Only 29.6 percent were conversant with the effects of the medication itself.

## Discussion

The passage of the Education for All Handicapped Children Act formalized community commitment to the provision of specialized services for children with disabilities. Interagency agreements and statements by organizations of health professionals (26) affirmed the resolve of the medical community to collaborate with educators toward reaching mutual goals for disabled children. The findings of this study, performed nearly a decade after the mandate's passage, suggest that a number of unresolved issues continue to hamper progress toward total fulfillment of the law's objectives. These include (a) inconsistency of diagnostic classification, (b) lack of specification regarding expected involvements of physicians, (c) inadequate designation of responsibility for early identification, and (d) persistent inequities in the provision of comprehensive health services for all school children with disabilities.

Variation clearly persists in the way children are classified for the purposes of special education. This variation is reflected by differences among the five study districts in the overall percentage of elementary school children assigned to special education, the percent distribution of special education students by disability categories, and the severity of functional limitation within each disability category. Variations in State and local school classification criteria are one major determinant of these differences. For example, among the sites studied, IQ thresholds for determining whether a child should be considered "mentally retarded" varied from 69 to 77 (27). Moreover,



children with similar language disabilities were classed as "speech impaired" or "learning disabled," depending on the school system. Further, there were substantial differences in classification options for children with multiple handicapping conditions.

Variations among school districts in the classification of children are not necessarily pernicious. Nevertheless, they demand attention by child health professionals and policymakers because placement and service options are driven almost exclusively by the designation of the disability. Since placements do differ in academic emphasis and in the degree of social opportunity, the stakes for individual children may be high. Furthermore, labels may stigmatize children and blur their characteristics and needs (28). This study indicates particular concerns regarding children labeled "retarded" by the school but not by their parents.

Our study data suggest that practicing physicians are involved to some degree in identification, evaluation, child and parent counseling, and inservice training for school personnel. But most physician involvement is with children who have specific, organically based conditions. There is far less interaction around the group of children whose diagnoses are less clearly established and for whom there remain major questions about the best treatment approaches. In particular, the data for these five large communities indicate only minimal direct collaboration of pediatricians or other primary care physicians with the schools in addressing psychosocial, emotional, behavioral, and learning disorders.

Several major constraints to physicians' interaction with the schools may explain the low level of involvement. One disincentive is that there are few financial rewards for physicians' participation in educational planning. In less than 1 percent of cases in this study were physicians paid by the school system for child evaluations. There also remains an awkward lack of understanding between the school staff and the physician as to what each wants from the other and what each can provide. For example, school personnel often request "a neurological" as part of the evaluation of a learning disabled child to assure that there is "nothing organic" without the full appreciation that a standard neurological evaluation does not always help answer that question.

In a similar fashion, physicians often demonstrate naivete by ordering one-to-one tutoring for children when they have never visited the school or discussed with the educators the effect of peer

*'But most physician involvement is with children who have specific, organically based conditions. There is far less interaction around the group of children whose diagnoses are less clearly established and for whom there remain major questions about the best treatment approaches.'*

interaction on the child's learning. Such mutual ambivalence and miscommunication can often discourage physicians from involvement. Finally, physicians often fail to communicate effectively with schools and parents about the day-to-day effects and prognosis of developmental conditions because the natural history of many disorders remains poorly understood.

With regard to public health concerns, the data from this study point to three major areas of continued policy importance. First, while access to and use of health care among the children in this sample were generally high, there were major between-site differences reflecting incomplete coverage of health services for substantial numbers of children (29, 30). Second, early identification efforts have clearly been less effective for some conditions than for others. Although it may not be feasible to detect all developmental and behavioral difficulties before school entry, efforts should continue to identify as many children as possible at the earliest time. The identification of 20 percent of the mentally retarded children and 70 percent of those with "other developmental disabilities" after the age of 5 years represents a failure of the health and mental health systems in mounting effective early identification efforts in the community. Third, although schools are providing the bulk of related services, controversy continues around who should provide and pay for them. Since these are marginal services as far as the educational sector is concerned, program planners must continue to make funds available through public health, Federal subsidy, or through State educational funding.

In conclusion, this study of children with special needs allows a look at the workings of two large service sectors as they try to meet society's mandate to provide appropriate educational and social experiences for children with disabilities. Clearly,

there has been less than full exploitation of the new opportunities for innovative, combined health and special education programs. Only with determined emphasis on coordinated research, training, and program planning will health and special education practitioners bring the handicapped children's program to fruition.

## References.....

1. The Education for All Handicapped Children Act of 1975. P. L. 94-142, 20 U.S.C. 1401 et seq; Federal Register 42: 42473-42518, Aug. 23, 1977.
2. Research for Better Schools, Inc: LRE developing criteria for the evaluation of the least restrictive environmental provision. Department of Health, Education, and Welfare, Office of Education, Bureau of Education for the Handicapped, Washington, DC, 1979, pp. 151-228.
3. Certo, N., Haring, N., and York, R.: Public school integration of severely handicapped students. Paul H. Brookes Publishing Co., Baltimore, 1984.
4. Dunn, L. M.: Special education for the mildly retarded: is much of it justified? *Exceptional Children* 35: 5-22 (1968).
5. Green, D.: Local implementation of P. L. 94-142 education agency responsibility for "related services." SRI International, Menlo Park, CA, November 1980.
6. Palfrey, J. S., Mervis, R. C., and Butler, J. A.: New directions in the evaluation and education of handicapped children. *N Engl J Med* 298: 819-824, Apr. 13, 1978.
7. U.S. Office of Special Education and Rehabilitation Services: Fifth annual report to Congress on the implementation of Public Law 94-142: The Education for All Handicapped Children Act. U.S. Department of Education, Washington, DC, 1983.
8. Yohalem, J. B., and Yohalem, D.: Report by the Education Advocates Coalition on Federal compliance activities to implement the Education for All Handicapped Children Act (P. L. 94-142). Mental Health Law Project and Children's Defense Fund, Washington, DC, Apr. 16, 1980.
9. Heller, K. A., Holtzman, W. H., and Messick, S., editors: Placing children in special education: a strategy for equity. National Academy Press, Washington, DC, 1982.
10. Madden, N. A., and Slavin, R. E.: Mainstreaming students with mild handicaps: academic and social outcomes. *Rev Educational Res* 53: 519-569 (1983).
11. SRI International: Local implementation of P. L. 94-142, final report of a longitudinal study. Menlo Park, CA, December 1982.
12. Research for better schools: exploring issues in the implementation of P. L. 94-142. I.E.P. developing criteria for the evaluation of individualized educational program provisions. Department of Health, Education, and Welfare, Washington, DC, May 1979.
13. Gottlieb, J.: Mainstreaming: fulfilling the promise? *Am J Ment Defic* 86: 115-126 (1981).
14. Sommers, P. A., and Fuchs, C.: Pediatric care for exceptional children: an inferential procedure utilizing consumer satisfaction information. *Med Care* 18: 657-667 (1980).
15. Ebers, D., and Kodera, T. L.: Interagency cooperation: medical and educational. *Nebr Med J* 203-205, August 1981.
16. Schor, E. L., Smalky, B. S., and Neff, I. M.: Primary care of previously institutionalized retarded children. *Pediatrics* 67: 536-540 (1981).
17. Cochran, W. G.: Sampling techniques. Ed. 3, John Wiley & Sons, Inc., New York, 1980.
18. National Center for Health Statistics: Current estimates from the National Health Interview Survey: United States, 1981. *Vital Health Stat [10] No. 141*. DHHS Publication No. (PHS) 82-1569, Hyattsville, MD, 1982.
19. Walker, D. K., and Gortmaker, S. L.: Community child health studies. Final report prepared for the Maternal and Child Health and Crippled Children's Services Research Grants Program, Bureau of Community Health Services, HSA, PHS, by the Harvard School of Public Health. National Technical Information Service, Springfield, VA 1983, (PB No. 84199751).
20. Stein, R. E., and Jessop, D. J.: A noncategorical approach to chronic childhood illness. *Public Health Rep* 97: 354-362, July-August 1982.
21. Robert Wood Johnson Foundation: Updated report on access to health care for the American people. Special Report No. 1, Princeton, NJ, December 1983.
22. U.S. Bureau of the Census: Money income and poverty status of families and persons in the United States, 1982. Current Population Reports Series P-60, No. 140. U.S. Government Printing Office, Washington, DC, 1983.
23. Cohen, J.: Statistical analyses for the behavioral sciences. Ed. 2. Academic Press, New York, 1977.
24. Butler, J. A., Starfield, B., and Stenmark, S.: Child health policy. In *Child development research and social policy*, by H. W. Stevenson and A. E. Siegel. University of Chicago Press, Chicago, 1984, Ch. 2, pp. 110-188.
25. National Medical Care Utilization and Expenditure Survey, 1980. U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics Public Use Data Tape Documentation.
26. Subcommittee on Select Education of the Committee on Education and Labor, House of Representatives: Oversight of Public Law 94-142—the Education for All Handicapped Children Act, Pt. 1. Hearings held in Washington, DC, on Sept. 27, Oct. 9, 11, 16, and 24, 1979.
27. Patrick, J. L., and Reschly, D. J.: Relationship of state education criteria and demographic variables to school-system prevalence of mental retardation. *Am J Ment Defic* 86: 351-360 (1982).
28. Hobbs, N., Egerton, J., and Matheny, M. H.: Classifying children. *Children Today*: 21-25, July-August 1975.
29. Singer, J. D., Butler, J. A., and Palfrey, J. S.: Health care access and use among handicapped students in five public school systems. *Med Care* 24: 1-13 (1986).
30. Butler, J. A., Singer, J. D., Palfrey, J. S., and Walker, D. K.: Health insurance coverage and physician use for children with disabilities. *Pediatrics*. In press, 1986.