

Identification of Disabilities and Service Receipt Among Preschool Children Living in Poverty

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Abstract

This study examined the prevalence of indicators of disability or potential disability among preschool-aged children enrolled in the Early Head Start Research and Evaluation Longitudinal Follow-Up. Three categories of indicators were established: received Part B services, developmental risk, and biological risk. The majority of participating children (62%) were classified into at least one category. Children living in poverty from birth through preschool and of minority status were among those most likely to be classified; these children were likely to have received a variety of services. The majority of children who received Part C services (79.8%) received Part B services as preschoolers, but 33% of the children with a developmental risk identified before age 3 continued to have a developmental risk during preschool yet did not receive specialized services. Results highlight the importance of understanding the relations among child and family characteristics and service receipt to inform policy and practice.

Keywords

early childhood special education, Part C services, early identification

High-quality early childhood programs are associated with better outcomes, especially for children at risk for developmental delays or poor academic achievement (Love et al., 2005; Peisner-Feinberg et al., 2001; Ramey et al., 2000; Schweinhart et al., 2005). Public funding to enhance early development is sound economic policy as well, particularly for children living in poverty (Heckman, 2006). Yet large numbers of children do not have access to high-quality, inclusive early care and education likely to simultaneously enhance child development and provide family support (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Clarke-Stewart, Vandell, Burchinal, O'Brien, & McCartney, 2002; Knocke, Peterson, Edwards, & Jeon, 2006; Odom et al., 2001; Shonkoff & Phillips, 2000).

Early Care and Education Services: Current and Historical Efforts

States are expanding early care and education services, through both universal preschool education and enhancement of child care quality. A total of 38 states now fund preschool education. During the 2008–2009 school year, 25% of American 4-year-olds and 3% of 3-year-olds attended publicly funded preschools, a slight increase over previous

years (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009). Quality, however, varied; eight states improved on the Quality Standards Checklist established by the National Institute for Early Education Research, but three states lost ground. When adjusted for inflation, per child spending for preschool education decreased slightly (Barnett et al., 2009). Since 2000, 22 states and the District of Columbia assess the quality of early care and education programs, particularly child care programs, through rigorous Quality Ratings Systems (National Child Care Information and Technical Assistance Center, 2010). These efforts have spawned an array of training opportunities for early care and education providers.

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Expansion of universal early childhood services builds on sustained efforts to provide high-quality early childhood programs for vulnerable children. Head Start was the earliest broad-based public effort to enhance the development of young children living in poverty. Head Start pioneered both a two-generation approach to serving young children and their families and the inclusion of children with disabilities. Since its 1965 origin, Head Start has expanded steadily, serving nearly one million children, including 11.5% with disabilities, in 2009 (Office of Head Start, 2010). Early Head Start (EHS), which began serving families with children younger than age 3 in 1995, has expanded rapidly, though it continues to serve a much smaller proportion of eligible children than Head Start. More than 66,000 children were enrolled in 650 EHS programs across the country in 2009 (Office of Head Start, 2010). Head Start and EHS are not entitlement programs; available funds are insufficient to serve all eligible children and families, substantiating calls to expand state funding of early childhood services (Barnett et al., 2009).

Children with disabilities, by contrast, are entitled to specialized services. Early childhood special education (ECSE) services must be available to children between ages 3 and 9 who have a disability and need specialized services (Individuals with Disabilities Education Improvement Act [IDEA], 2004, §602). Preschool-aged children with disabilities have been entitled to special education services for more than two decades; in 2004, the last year for which official records are available from the U.S. Department of Education, 5.9% of 3- to 5-year-olds in the United States (693,245) participated under Part B of the IDEA (U.S. Department of Education, 2006). Special education services are available to all eligible children, and states are required to conduct child-find activities to identify all who may need these services. Only half as many preschoolers, however, receive special education as compared to school-aged children, where 11.8% of children between the ages of 12 and 17 years participated in special education in 2004 (U.S. Department of Education, 2006). School attendance is mandatory for older children, and clearer curricular standards and expectations are specified, potentially making identification of children's learning challenges easier. Identification of disabilities among preschool-aged children is likely hampered by lack of universal early care and education services, a "wait and see" attitude often voiced by professionals and family members, and a lack of clear consensus on early learning standards.

Families of infants and toddlers with disabilities have been entitled to individualized services through Part C (IDEA, 2004, §632) since the 1990s. Eligible families have a child younger than 3 years of age who is experiencing a developmental delay or has a diagnosed physical or mental condition likely to result in developmental delay. Also, states may provide services to infants and toddlers at risk of experiencing a substantial developmental delay (IDEA, 2004, §632). In

2004, 2.3% of children from birth through 2 years of age (282,733) were served under Part C of the IDEA (U.S. Department of Education, 2006).

Although U.S. public commitment to early care and education services is growing, many young children and their families do not participate in potentially beneficial programs. Policy makers have yet to agree about essential questions such as who should receive which types of services and how those services should be delivered (Fuller, 2007). Early childhood services have often targeted young children living in poverty. Poverty, especially when experienced during the early childhood years, is associated with a host of poor outcomes throughout the school years (Brooks-Gunn & Duncan, 1997; Korenman, Miller, & Sjaastad, 1995; Miller & Korenman, 1994; Peisner-Feinberg et al., 2001; Walker, Greenwood, Hart, & Carta, 1994) and into adulthood (Kokko & Pulkkinen, 2000). Pilot preschool programs have had positive impacts on the academic achievement and life outcomes for young children living in poverty (Ramey et al., 2000; Schweinhart et al., 2005). Unfortunately, community-based agencies do not always attain the expected results when implementing these programs on a larger scale (Barnett & Ackerman, 2006). Focus on services, notably special education services, for children living in poverty is warranted as higher proportions of children living in poverty receive services under the auspices of both Part C (Scarborough et al., 2004) and Part B (Carlson et al., 2008) than do their more advantaged peers.

What We Know About Children and Families Receiving Specialized Services

Although families from all socioeconomic groups obtain Part C services, recipients are more likely than families in the general population to be living in poverty (28% vs. 24%; Scarborough et al., 2004). Slightly more than one fourth of families enrolled in Part C receive welfare. One third receive cash assistance such as food stamps, Women, Infants, and Children (WIC) vouchers, or Supplementary Security Income (SSI; Scarborough et al., 2004). Close to half (43%) of families receiving Part C services face financial struggles (\$25,000 or less annual incomes; Hebbeler et al., 2007).

The vast majority of participating families report high levels of satisfaction with their Part C services, but families of minority status and those in which the mother does not have a high school diploma are among those least likely to report positive experiences with Part C services (Hebbeler et al., 2007). Many of these same families report difficulties accessing Part C services; a variety of supports, however, do facilitate both enrollment and persistence in Part C services (Sonoma State University, 2002; Summers et al., 2001; Taylor et al., 2005). Difficulties that vulnerable families report accessing Part C services were evident among families participating in the Early Head Start Research and Evaluation (EHSRE) Project.

Twice as many children participating in the EHSRE received Part C services (4.7%; Peterson et al., 2004) compared to those in the U.S. population (< 2.0% during the same time period; U.S. Department of Education, 2006). Many more children in this sample, however, did not receive Part C services even though they had a variety of medical diagnoses and/or developmental delays that likely would have made them eligible (Peterson et al., 2004). Families facing the highest numbers of risks and those with certain demographic characteristics (e.g., non-English speakers) were among those least likely to receive Part C services even though their children were among those most likely to score low on developmental assessments done as part of the EHSRE (Peterson et al., 2004). However, EHS was a support to families in accessing and persisting with specialized services. Among children participating in the EHSRE who were eligible for Part C services, those whose families were enrolled in EHS were significantly more likely to have received Part C services than were control group families who lived in the same communities (5.7% vs. 3.7%; Peterson et al., 2004). Furthermore, families of children with disabilities maintained EHS enrollment longer and were more highly engaged in EHS services than their counterparts whose children did not have disabilities (Roggman, Cook, Peterson, Raikes, & Staerkel, 2008).

Continuity Between Part C and Part B Services

The majority of children who receive specialized services receive these services continually from infancy into the elementary school years, but almost 40% do not. Among the children who receive Part C services, 63% transition into Part B services between the ages of 3 and 5 years, whereas 16% leave Part C services before age 3 and another 20% receive Part C until age 3 but then do not move into Part B services (Hebbeler et al., 2007). This is not necessarily surprising as eligibility criteria for Parts C and B are different. Among children who receive special education services during elementary school, however, only 15% participated in Part C services as infants and toddlers and fewer than half (44%) received Part B services as preschoolers (Wolery & Bailey, 2002). These statistics suggest that more children could be served earlier with improved identification of young children. Although early services are presumed to produce more positive outcomes (Bailey, Aytch, Odom, Symons, & Wolery, 1999; Wolery & Bailey, 2002), clearer understanding of associations among early identification of developmental risks, continued and/or later identification of developmental risks, and participation in services is needed to guide policy regarding service design and delivery (Shevell, Majnemer, Platt, Webster, & Birnbaum, 2005).

This study, nested within the EHSRE Longitudinal Follow-Up Project (Longitudinal Follow-Up), examines the prevalence

of identified and potential disabilities among low-income children when age eligible for kindergarten. Identified disabilities were equated with receipt of Part B services. Potential disabilities were of two types, based on indicators of developmental risk and indicators of biological risk. The following questions were addressed: (1) What was the prevalence of specific disability indicators among low-income children between ages 3 to 5 years? (2) What were the relations between having a disability indicator and specific family characteristics? (3) What were the relations between having a disability indicator and receipt of specialized services? (4) What was the continuity between specialized services during the infant-toddler years (Part C services) and the preschool years (Part B services)? and (5) Was the receipt of Part B services during the preschool years predicted by the incidence of specific disability indicators during the infant-toddler period?

Method

The EHSRE enrolled 3,001 families into a rigorous experimental design study to evaluate impacts of the EHS program. All families participating in the EHSRE were assigned randomly to the EHS program ($n = 1,513$) or a control group ($n = 1,488$). Families living in 17 communities across the United States were enrolled in the EHSRE between July 1996 and September 1998, and the original EHSRE followed families through 2001 when all participating children had reached 3 years of age. The same families were invited to participate in the Longitudinal Follow-Up, which followed families ($n = 2,310$) through 2004 when all participating children had become age eligible for kindergarten enrollment.

The EHS Research Consortium, which included researchers from 15 universities, Mathematica Policy Research, Inc., and the Administration on Children and Families, collaborated to conduct the EHSRE. After collection of large amounts of data, from multiple sources, measures were scored and several summary variables were constructed centrally. The analyses presented here are secondary to the central purposes of the EHSRE project and, therefore, were begun after data were made available to members of the EHS Research Consortium.

Participants

At the time of EHSRE enrollment, families had incomes at or below the federal poverty guideline and included a pregnant woman or a child younger than 1 year of age (the age criterion for participation in the EHSRE). Demographic data, collected at enrollment in the EHSRE, to describe families participating in the original EHSRE and those participating in the Longitudinal Follow-Up are presented on Table 1. There were not statistically significant differences between

Table 1. Key Baseline Characteristics of Primary Caregivers Participating in the EHSRE ($N = 3,001$) and the Longitudinal Follow-Up ($N = 2,310$).

Characteristic	% of participating families	
	EHSRE	Longitudinal follow-up
Female	99	99
Teenager (younger than 20) at target child's birth	39	39
Married and lives with spouse	25	26
Race/ethnicity		
African American	35	35
Hispanic	24	23
White	37	38
Other	5	4
Main language is not English	21	20
Does not speak English well	12	10
No high school diploma	48	46
Employment or education activity		
Employed	23	24
In school or training	22	22
Other	55	54
Receives welfare cash assistance (AFDC/TANF)	35	34

Source: Head Start Family Information System application and enrollment data; collected at Early Head Start Research and Evaluation (EHSRE) enrollment.

Abbreviations: AFDC = Aid to Families with Dependent Children; TANF = Temporary Assistance for Needy Families.

the families participating in the EHSRE and those who continued their participation in the Longitudinal Follow-Up. In addition, there were not statistically significant differences between families in the experimental (enrolled in EHS program) and control (community comparison) groups during the Longitudinal Follow-Up; thus, all participants were examined together for purposes of describing the incidence of disability indicators among the participating children.

Data Collection Procedures

Data were collected via direct child assessments and interviews with parents and early care and education providers during both the EHSRE and the Longitudinal Follow-Up. A primary caregiver (usually the mother) was identified as the respondent for each family. The respondent provided informed consent for her family's participation in both the EHSRE and the Longitudinal Follow-Up. All reasonable efforts were made to communicate with that same individual at all assessment points to maximize consistency of the data as well as to interview in the informant's preferred language. Spanish editions of measures were used when

appropriate, and assessment materials were translated into other languages as necessary. Information regarding family demographic characteristics was collected at the time of EHSRE enrollment. Parent interviews, program staff interviews, and direct child assessments from the EHSRE were used to identify children as having a disability indicator (e.g., received Part C services, had a medical diagnosis) during their first 3 years of life (Peterson et al., 2004).

As part of the Longitudinal Follow-Up, when the children were between 3 and 5 years of age, information regarding the child's and family's needs for and participation in services, including Part B, as well as parental education and employment was collected during the tracking interviews completed at approximately 6-month intervals between their child's third birthday and age eligibility for kindergarten. During the in-home visit conducted the spring or summer before the children entered kindergarten, trained assessors collected information regarding parenting attitudes and experiences and the child's health via a parent interview and assessed the child's development directly. For those children who had participated in early care and education settings, additional information regarding their eligibility for and participation in Part B services as well as information regarding their social-emotional development was collected from the program providers.

Measures

Demographic characteristics and service receipt. Demographic data were gathered from parents at enrollment into the EHSRE using the Head Start Family Information System Application and Enrollment Forms. Additional information regarding family characteristics (e.g., family composition) and service participation (e.g., activities related to self-sufficiency, participation in early care and education, Part B services) during the children's preschool years was collected from parents during the tracking interviews and during the in-home interview. Early care and education providers were also interviewed shortly before the children were to enter kindergarten.

Indicators of disability or potential disability. Data from parent and early care and education staff reports, as well as direct child assessment, were used to identify children who had disabilities or potential disabilities. Parents were asked a series of questions, during the tracking interviews, that might suggest that their children had disabilities and/or needed health- or disability-related services (e.g., "Does your child receive Part B early childhood special education services?" "Has a professional ever diagnosed your child as having a vision problem?" "Does your child have asthma or experience wheezing?"). During the in-home interviews, parents completed the *Child Behavior Checklist-Parent Report* (Achenbach & Rescorla, 2000). Early care and education

providers were asked about whether children enrolled in their programs were eligible for Part B services and completed the *Child Behavior Checklist–Teacher Report* and the *Social Skills Rating System* (Gresham & Elliott, 1990).

In addition, each child's receptive vocabulary development was assessed directly during the in-home interviews. Trained assessors administered the *Peabody Picture Vocabulary Test–Third Edition* (PPVT-III; Dunn & Dunn, 1997) or the *Test de Vocabulario en Imagenes Peabody* (TVIP; Dunn, Padilla, Lugo, & Dunn, 1986). During the EHSRE, parents reported on their children's expressive language development by completing the *MacArthur Communicative Developmental Inventories* (Fenson et al., 2000), and children's skills were assessed directly. Children's language skills were assessed with the PPVT-III (Dunn & Dunn, 1997) or the TVIP (Dunn et al., 1986), their cognitive skills with the *Bayley Scales of Mental Development* (Bayley, 1993).

Definitions for Categories of Indicators of Disability—Preschool Period

The researchers developed three categories for the Longitudinal Follow-Up: received Part B services, developmental risk, and biological risk. A continuum of developmental markers, available in the data set and linked to diagnosed disabilities or developmental risk or biological risk, was used to develop the categories. In addition, some children had none of these identified indicators and were grouped into a fourth category for several analyses.

The same conceptual categories guided examination of indicators of disability during the EHSRE and the Longitudinal Follow-Up. Categories of indicators, based on several practical and conceptual considerations, reflect conceptualizations of disability or developmental risk outlined in the IDEA. The categories are considered, in general, to be progressive and represent a continuum of likelihood that a child would be considered eligible for Part C or Part B services. Following this logic, a child receiving Part B services was identified as having a disability. A child who had a developmental risk would have been more likely to be identified as eligible to receive Part B services than a child who had a biological risk or no indicator of potential disability. Since the purpose of this investigation was to identify the prevalence of disabilities or potential disabilities among this population of vulnerable children, inclusion of variables in each category was somewhat liberal. Information collected from a variety of sources (e.g., parents, early care, and education providers) was used to build the categories. Since data for several constructs were collected from these various respondents over time and frequently with different measures, it was not possible to identify discrepancies in reports from different

respondents in a reliable way. Criteria for inclusion in each category are described below and summarized in Table 2, along with presentation of the numbers of children identified with each indicator.

Children who received Part B services. This category consisted of children reported to have received Part B services ($n = 430$) at any time between ages 3 and 5. Parents were asked about their child's receipt of Part B services during tracking interviews and the in-home assessment conducted prior to the child's kindergarten entry. For children enrolled in an early care and education program, the center director was asked whether the child received special education services. A positive response at any of these opportunities resulted in this classification.

Children who had developmental risks. This category consisted of children with a developmental or behavioral concern identified via developmental assessment or report from the child's parent or teacher ($n = 912$). Children were included in this category if they scored low on the PPVT-III or the TVIP, specifically below a standard score of 77, which falls at least 1.5 standard deviations below the measure's mean, below the average range, and lower than the 5th percentile. Children were also included in this category if their parents or their preschool teacher reported that they had a behavior or social skills problem that interfered with their learning and development. Children were included if their parents reported that their child had difficulty with vision, hearing, communication, using arms or hands, or using legs or feet or needed to use equipment to move around.

Children who had biological risks. This category consisted of children who have chronic health conditions, most of which have a fairly low association with developmental problems, individually or in combination with other risk factors ($n = 817$). Conceptually, this category was based on the "biological risk" category specified in Part C of the IDEA as well as justified by research literature. For instance, children with asthma are 1.7 times more likely to have learning disabilities than healthy children, and children with "fair" or "poor" health are twice as likely to have learning disabilities as those reported to have "good" health (Fowler, Davenport, & Garg, 1992). Health conditions included in this category (e.g., diabetes, anemia, congenital heart disease) involve various body systems, but not primarily the brain or central nervous system. Children whose parents reported that they had asthma, high lead levels, low weight, or "fair" or "poor" health were included in this category, as were those whose parents reported they had had a serious illness since birth or had been on prescription medication for longer than 30 sequential days.

Table 2. Numbers of Children With Specific Indicators of Disability or Potential Disability and Percentages Receiving Part B Services.

Disability indicator	Total (N = 2,310)		Receiving Part B services (N = 430)	
	n	%	n	%
Children who received Part B services	430	18.6	430	100.0
Parent reported child had received Part B services	335	14.5	335	77.9
Center director reported child had received Part B services	186	8.1	186	43.3
Children who had developmental risks	912	39.5	276	64.2
Child scored < 70 on PPVT or TVIP	190	8.2	62	14.4
Child scored < 77 on PPVT or TVIP	350	15.2	96	22.3
Parent reported problems with aggressive behavior	240	10.4	83	19.3
Child's caregiver reported problems with aggressive behavior	122	5.3	39	9.1
Parent reported problems with social behaviors	203	8.8	87	20.2
Child's caregiver reported problems with social behaviors	102	4.4	46	10.7
Parent reported the child is withdrawn	116	5.0	31	7.2
Child's caregiver reported the child is withdrawn	85	3.7	49	11.4
Parent reported the child is hyperactive	250	10.8	97	22.6
Child's caregiver reported the child is hyperactive	102	4.4	38	8.8
Parent reported emotional problems since child's 3rd birthday	77	3.3	56	13.0
Children who had biological risks	817	35.4	208	48.4
Child has allergies	360	15.6	90	20.9
Child has asthma or wheezing	294	12.7	77	17.9
Child has vision problems	147	6.4	43	10.0
Child has hearing problems	91	3.9	46	10.7
Child is underweight	72	3.1	26	6.0
Child has kidney or urinary track problems	68	2.9	16	3.7
Child has anemia	53	2.3	15	3.5
Child is overweight or obese	45	1.9	11	2.6
Child has short stature	42	1.8	8	1.9
Child has lead poisoning	21	1.0	6	1.4
Child has high blood pressure	12	1.0	2	0.5
Child has epilepsy or seizures	10	— ^a	7	1.6
Child has tuberculosis	3	—	1	0.2
Child has diabetes	1	—	1	0.2

Abbreviations: PPVT = Peabody Picture Vocabulary Test; TVIP = Test de Vocabulario en Imagenes Peabody.

^aPercentage is smaller than 0.1%.

Comparison to Categories of Indicators of Disability—Infant–Toddler Period

As stated above, the same conceptual categories and similar types of variables were used to identify children as having an indicator of a disability or a potential disability during the EHSRE and the Longitudinal Follow-Up. During the EHSRE, when the participating children were between birth and age 3, four categories, roughly equivalent to the categories used during the Longitudinal Follow-Up, were established. The categories of children who received Part C services, used in the EHSRE, and children who received Part B services, used during the Longitudinal Follow-Up, are similar. Children with a diagnosed condition likely to make them eligible for Part C services was a category used during the EHSRE; a similar category was deemed unnecessary

in the Longitudinal Follow-Up as it did not identify any children not included in other categories. Children with a developmental risk and children with a biological risk were categories used in both the EHSRE and the Longitudinal Follow-Up. As well, children with no identified disability indicators were found in both studies. Further details regarding children with disabilities in the EHSRE are available in Peterson et al. (2004).

Overlap Among Categories of Indicators of Disability and Data Analyses Procedures

Children were counted in a category if they had any corresponding indicator; Table 2 presents the numbers of children identified as having each of the specific indicators and

falling into each category. Some children were counted in more than one category; for example, a child receiving Part B services likely had one of the indicators of a developmental risk or possibly had indicators of both a developmental and a biological risk. The total numbers of children assigned to each category were used to examine the relations among indicators, family demographic characteristics, and service receipt.

To examine the continuity between Part C and Part B services, children were assigned to mutually exclusive categories for both the infant-toddler and preschool age periods. For example, for the analyses conducted to address Research Questions 4 and 5, a child who received Part B services was counted in that category alone even if he or she was also identified by a variable included under developmental risk (e.g., scored less than 77 on the PPVT) or biological risk (e.g., had asthma). The same strategy was used to assign children to categories before age 3. Following this, the continuity of indicators of disability and potential disability was examined using chi-square analyses. Whether having an indicator identified before age 3 predicted receipt of Part B services during the preschool period was examined using logistic regression.

Results

Prevalence of Indicators of Disability Among 3- to 5-Year-Olds

The majority of participating children (1,421; 62%) were identified as having at least one indicator of a disability or potential disability. Among these children, 18.6% received Part B services between the ages of 3 and 5; this is more than 3 times the percentage of children in the U.S. population who received Part B services as preschoolers during this same time period (U.S. Department of Education, 2006). Large numbers of children were identified as having indicators of potential disabilities as well. Nearly 40% of the children were identified as having a developmental risk, and 35% of the children were reported to be facing a biological risk. Table 2 provides the numbers of children in each of the three categories described above, as well as the number of children having each of the specific indicators used to build each category. In addition, Table 2 presents the percentage of children identified with each specific indicator who received Part B services. For example, within developmental risk, of the 350 children scoring less than 77 on the PPVT or TVIP, 96 (22.3%) received Part B services. Prevalence of an indicator, including receipt of Part B services, did not differ among children randomly assigned initially to the program (family enrolled in EHS) or control group.

Relations Among Indicators of Disability and Family Characteristics

Children with specific demographic characteristics were more likely to receive Part B services and to be identified as having certain indicators of potential disability. Children of minority status (62% overall) were less likely to have received Part B services (16.4% vs. 22.3%), $\chi^2(1) = 12.62$, $p < .001$, as well as to have been identified as having a biological risk (37.6% vs. 42.6%), $\chi^2(1) = 5.15$, $p = .02$, but were more likely to have been identified as having a developmental risk (44.9% vs. 40.3%), $\chi^2(1) = 4.31$, $p = .04$. Those still living in poverty during their preschool years (49% overall) were more likely to have received Part B services (23.5% vs. 17.2%), $\chi^2(1) = 11.38$, $p < .001$, as well as to have been identified as having a developmental risk (49.2% vs. 3.85%), $\chi^2(1) = 22.23$, $p < .001$. Children living in families who spoke English primarily were less likely to be identified as having a developmental risk (41.2% vs. 61.1%), $\chi^2(1) = 35.48$, $p < .001$, and more likely to be identified as having a biological risk (41.5% vs. 26.6%), $\chi^2(1) = 20.45$, $p < .001$, than their peers from families who spoke other languages primarily; there was a trend toward a greater likelihood of their receipt of Part B services as well (20.5% vs. 15.5%), $\chi^2(1) = 3.56$, $p = .06$. Children whose mothers had at least a high school education were less likely to be identified as having a developmental risk than those whose mothers had not completed high school (38.9% vs. 54.8%), $\chi^2(1) = 44.31$, $p < .001$; despite this, maternal high school completion was not associated with children having received Part B services (19.0% vs. 22.1%), $\chi^2(1) = 2.55$, $p = .11$. As well, children of mothers who completed high school were more likely to be identified as having a biological risk (41.2% vs. 36.0%), $\chi^2(1) = 4.83$, $p < .03$.

Relations Among Indicators of Disability and Service Receipt

Having one or more indicators of disability or potential disability was associated with an increased probability of children receiving services to enhance child development. Furthermore, their families were more likely to have received various social services. Among the children who received Part B services, targets were most often communication skills (47.7%) and behavioral or emotional problems (20.9%). Smaller percentages of children in Part B services received assistance with motor skills involving their hands and arms (12.1%) or feet and legs (11.9%) or for health (6.3%), vision (5.1%), or hearing (5.1%).

Children who received Part B services as well as those who had indicators of potential disability were more likely

Table 3. Continuity of Special Education Services and Indicators of Disability and Potential Disability Between Birth and Kindergarten Entry ($N = 2,168$).

	Ages birth to 3 years							
	Part C services		Developmental risks		Biological risks		No identified disability indicator	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Ages 3 to 5 years								
Part B services	103	79.8	77	24.6	142	15.4	90	11.2
Developmental risks	15	11.6	105	33.5	267	28.9	214	26.7
Biological risks	2	1.6	39	12.5	180	19.5	111	13.7
No identified disability indicator	9	7.0	92	29.4	336	36.3	386	48.2

$\chi^2 = 395.5$ ($df = 9$), $p < .001$.

Table 4. Prediction of Receipt of Part B Services Between Ages 3 and 5 Based on Identification of Indicators of Disability and Potential Disability Before Age 3.

Variable	<i>B</i>	<i>SE</i>	Odds ratio	CI (95%) for odds ratio		Wald statistic
				Lower	Upper	
Part C services	2.40	0.34	10.99	5.65	21.38	49.78***
Eligible for, but not receiving, Part C services	0.39	0.26	1.47	0.89	2.40	2.31
Developmental risks	1.13	0.22	3.08	2.00	4.76	25.89***
Biological risks	0.39	0.20	1.48	1.01	2.17	4.03*
Nagelkerke R^2	.29					

* $p < .05$. *** $p < .001$.

than children with no indicator to have received a variety of health related services. For example, children who had an indicator were more likely than other children to be covered by health insurance (90.5% vs. 85.8%), $\chi^2(1) = 10.37$, $p < .01$; their coverage, however, was more likely to have been Medicaid (63.6% vs. 47.3%), $\chi^2(1) = 48.74$, $p < .001$, than private insurance. Furthermore, children with an indicator were less likely than those with no indicator to have used a doctor or HMO as a medical home (59.6% vs. 65.7%), $\chi^2(1) = 6.94$, $p < .01$.

Families of children who had any indicator of disability or potential disability were more likely than other families to have received a variety of types of income supports, including Temporary Assistance for Needy Families (TANF; 17.4% vs. 10.9%), $\chi^2(1) = 14.91$, $p < .001$, or general assistance (12.0% vs. 0.3%), $\chi^2(1) = 4.16$, $p < .05$. Many families that included a child with an indicator received SSI (10.2% vs. 5.9%), $\chi^2(1) = 10.27$, $p < .01$. In addition, these same families were more likely to have received nutritional services in the form of food stamps (37.2% vs. 26.5%), $\chi^2(1) = 22.96$, $p < .001$, and/or WIC vouchers (33.0% vs. 25.8%), $\chi^2(1) = 11.2$, $p < .001$, than were families of children with no indicators.

Continuity of Indicators of Disability

Children who had any indicator identified before age 3 were more likely to receive Part B services between ages 3 and 5 than were those with no indicator identified before age 3 (see Table 3). The majority of children who received Part C services (79.8%) and nearly a quarter of the children who had a developmental risk (24.6%) prior to age 3 but did not receive Part C services did receive Part B services as preschoolers. Developmental and biological risks identified before age 3 were likely to persist into the preschool years. Especially noteworthy is that one third of participating children (33.5%) were identified as having a developmental risk before age 3 and between ages 3 and 5 but never did receive special education services. It is not clear that all these children would have been eligible for special education services, yet this highlights their extreme vulnerability.

Prediction of Receipt of Part B Services by Early Indicators of Disability

Logistic regression was used to examine how having an indicator of disability or potential disability identified before

age 3 predicted receiving Part B services during the preschool years (see Table 4). Receiving Part C services before age 3 was the strongest predictor that a child would receive Part B services during the preschool years (see Table 4). Having a developmental risk was a very strong predictor of receipt of Part B services, and although having a biological risk did predict receipt of Part B services, the relationship was weaker.

Discussion

The current study confirms prior research (Brooks-Gunn & Duncan, 1997): young children living in poverty are vulnerable for poor developmental outcomes. In this sample, 18.6% of the children received Part B services, more than 3 times the percentage from the overall U.S. population for the past several years. This is positive if viewed from the perspective that these vulnerable children accessed needed services. There are, however, indications that child-find activities could be strengthened. The percentage of participating children who received services during the preschool period is a great deal higher than the small percentage (approximately 5%) who received Part C services during the infant-toddler period (Peterson et al., 2004). Differences between Parts C and B eligibility criteria likely contribute to this difference, but high percentages of children had indicators of potential disability during both age periods.

Many children were identified as having developmental (912, 39.5%) or biological risks (817, 35.4%) during their preschool years. Not all the children identified as having a developmental or biological risk would necessarily have qualified for ECSE services; it is alarming, however, that many children very likely to need and benefit from developmental support were among those least likely to receive those services. Children living in poverty and/or of color were among those most likely to be identified as having any indicator of potential disability, and children with mothers who had not earned a high school diploma were most likely to be identified as having a developmental risk. Similar to the current findings, children of color, from families who did not speak English, and whose mothers had not earned a high school diploma were among those most likely to have an indicator of potential disability identified before age 3 (Peterson et al., 2004). During the infant-toddler period, however, Caucasian families, those with relatively higher incomes, and those enrolled in EHS were more likely to receive Part C services (Peterson et al., 2004). This trend did not continue into the preschool period when larger percentages of children receiving Part B services were living in poverty. Perhaps the proverbial "chicken or egg" conundrum is operating here. Children of color and those living in poverty were among those most likely to participate in programs designed to serve children at risk (e.g., Head Start); it is possible that

this pattern of service participation is associated with more vigilant watchfulness for developmental delay and/or more ready access to a variety of specialized services.

Much higher percentages of participating children, overall, were enrolled in center-based early care and education programs during their preschool years (81.3%) than was true during the infant-toddler period (51%; Administration for Children and Families, 2002). Children enrolled in early care and education classrooms are compared routinely to their peers in formal and informal ways. Parents may ask teachers for advice or seek special services if concerned about their child's development. Teachers refer children for assessment and/or services when their development differs from that of peers. Participating children were much more likely to receive services to address a variety of developmental issues if they had any indicator of potential disability; almost half the children enrolled in Part B services were getting help with communication skills and 21% were getting help to address behavioral or emotional problems.

Children were more likely to receive health-related services (i.e., medical or dental checkups) when they had an indicator of disability or potential disability as well. Children were more likely to have health insurance coverage when they had an indicator though it was more likely that their coverage was publicly funded (e.g., Medicaid or State Children's Health Insurance Program [SCHIP]) than were children with no indicator. It may be that some families chose publicly funded insurance because their children receiving ECSE services or with an indicator of potential disability qualified for these under special rules within their local areas. There was, however, some indication that private insurance was associated with a more stable medical home; children with no identified indicator were more likely to use a private doctor's office or an HMO as their medical home than were children who had an indicator. Further evidence that families of children with an indicator were struggling is the fact that these families were more likely to be receiving a variety of financial supports (e.g., TANF), disability-related support (e.g., SSI), and nutrition supports (e.g., food stamps, WIC vouchers). It is not possible to untangle the web of circumstances that brings a child and his or her family to the attention of professionals, the relations among various service providers, and the referrals made among different service systems.

Receiving Part C services was a very strong predictor of receiving Part B services; the vast majority (79.8%) of participating children who received Part C services before age 3 were enrolled in Part B services as preschoolers. Many of the children who received Part B services, however, had other indicators of potential disability identified before age 3. Nearly one fourth of the children who had developmental risks, 15% of those with identified biological risks, and 11% of children with no disability indicator identified during the infant-toddler period, for example, received Part B

services as preschoolers. It is troubling though that one third of the children with a developmental risk identified before age 3 continued to have a developmental risk but did not receive Part B services as preschoolers. Even without firm evidence that these children would have met eligibility criteria for ECSE services, the likelihood that they received no systematic services is a cause for concern. The vulnerability of these children has been documented, and the “softer” effects that brought them to the attention of their parents and/or professionals may influence their development negatively. It is beyond the scope of this study to ascertain whether child outcomes and family functioning were compromised by not receiving individualized services.

Both law and professional practice guidelines recommend attentiveness to early identification. IDEA (2004) mandates that education agencies make concerted efforts to identify and serve children in need of special education services. Professional organizations representing early childhood educators and pediatricians recommend that when developmental concerns are identified, professionals and families refer children for evaluation and specialized services (American Academy of Pediatrics, 2002; Copple & Bredekamp, 2009; Sandall, Hemmeter, Smith, & McLean, 2005).

Limitations

Limitations related to the low-income sample of participating children and the definitions used to determine indicators of disability or potential disability warrant caution when interpreting these results. This study examined the prevalence of indicators of disability or potential disability and service receipt among low-income children eligible for EHS services. Findings cannot be generalized to the population as a whole; the proportion of participating children identified as having indicators was higher than that found in a nationally representative sample of children (Scarborough et al., 2004). In addition, low-income children are disproportionately enrolled in special education services throughout the school years (Hosp & Reschly, 2004; National Research Council, 2002).

This study was nested within the EHSRE and the Longitudinal Follow-Up. These studies were not designed to examine disability status per se. Researchers used variables available in the extant data sets to construct categories of indicators of disability and potential disability. These categories reflect indicators of developmental status commonly used to identify children as eligible for specialized services but do not mirror the eligibility criteria used for Part C or Part B services in any state. As well, information gathered from parents and teachers and via direct assessment was used to create categories of indicators. The timing of data collection and the nature of the instruments used made it

impossible to examine the consistency among these reports; there is, however, empirical evidence to support strong overlap between parent report and direct assessment (Diamond & Squires, 1993; Feldman et al., 2005; Johnson et al., 2004). Likely the categories of indicators constructed for this study are more inclusive, or liberal, than actual eligibility criteria; thus, we chose to describe them as categories of “indicators of disability or potential disability.”

In addition, the data used to construct these categories were collected for a research project. Efforts were made to notify families regarding developmental concerns for their children, but the researchers were not service providers who interacted with the families regularly, nor were they embedded in the local community service systems.

Implications for Future Research and Service Delivery

The alarmingly high percentage of children in this low-income sample identified as having an indicator of disability or potential disability warrants further research to examine the causal relations among child and family characteristics, children’s developmental status, family functioning, and service receipt. The large numbers of children identified as having developmental risks at multiple time points during their early years yet not receiving services is of particular concern; clearer understanding of the factors associated with these children receiving or not receiving services could prove valuable in discovering possible causal relations among these factors and in guiding the design and delivery of services. Continuing longitudinal study of these EHSRE children through elementary school will provide clearer understanding of the relations among indicators uncovered early in their lives and long-term outcomes. Individual indicators or groups of indicators may prove to be critical predictors. Similarly, determining the relations among specific indicators, service receipt, and long-term outcomes may add precision to the matching of children with specific services for optimal impacts.

Mapping the relations among a variety of child and family characteristics and service receipt could assist policy makers and practitioners to improve the design of child-find and service-delivery activities to maximize participation. Findings presented here echo those of other researchers who have shown that having a mother with limited education and coming from a family that does not speak English primarily and/or has very limited income are associated with poorer developmental status. Unfortunately, these same characteristics are associated with more limited participation in a variety of services designed to enhance parenting skills and child outcomes. Addressing those needs is essential not only for the futures of the children and their families but for our nation’s human capital.

Authors' Note

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