Which Newborns in New York City Are at Risk for Special Education Placement?

Doris Goldberg, MD, MPH, Margaret McLaughlin, MD, MPH, Margaret Grossi, MD, MPH, Alex Tytun, PhD, and Steve Blum, PhD

Introduction

Public Law 99-457 supports a national initiative to establish early identification and service systems for children with special needs from birth to 3 years of age. Some of the children who will require special education services in the early grades of school can be detected as having special needs in the first 3 years of life. Some may have medical conditions associated with cognitive difficulties, and others may have health or social risks for later learning problems. In this pilot study, we linked the educational placement records of third graders in the New York City public school system with information on their birth certificates and retrospectively analyzed the association of special education placement with characteristics recorded on birth certificates. The identification of newborns at risk can supplement the current identification of children with special needs and allow children to be targeted for preventive interventions in the preschool years to reduce their need for costly special education services in school.

A combination of reproductive health and sociodemographic variables was found to be the strongest predictor of school failure when Ramey et al. studied birth certificate data from North Carolina. Escalona found increased jeopardy for socially disadvantaged children with biological risks. Chamberlin recently concluded that perinatal factors have a decreasing impact and environmental factors have an increasing impact on developmental status as children progress from birth to the age of 7. Palfrey et al. found an association between mother’s educational attainment and early diagnosis of high- and low-prevalence learning disorders in children.

Methods

Data for this study consisted of linked birth and school records of 162 third graders attending New York City’s public schools. Access to school health records was obtained in three elementary schools located in three demographically distinct school districts: Bedford-Stuyvesant, Coney Island, and Staten Island. All third graders in special education classes (n = 45) were treated as “cases”; more than twice this number (n = 117) were randomly selected from the general education third-grade populations in the same schools and treated as “controls.” The case group was broadly defined to include the mildly retarded, the emotionally disturbed, and those requiring speech or other therapies to foster learning. Third graders were chosen because placement in special education classes is generally arranged at the end of second grade for children who exhibit learning or behavioral difficulties in the general classroom setting.

The dependent variable in this study was educational placement status; the predictor variables were obtained primarily from birth certificates, although additional information was gathered from available

The authors are with the New York City Department of Health.

Requests for reprints should be sent to Dr. Doris Goldberg, New York City Department of Health, 125 Worth Street, New York, NY 10013.

This paper was submitted to the Journal August 20, 1990, and accepted with revisions June 10, 1991.
school records. For example, “medical complications” is a constructed variable representing maternal pregnancy complications, chronic medical conditions preceding pregnancy, adverse health habits (e.g., smoking, alcohol or substance abuse), or a combination of these factors. “Changed school district” is a variable derived by comparing the community school district in which the residence address stated on the birth certificate is located with that where the child is actually enrolled in school; it is a rough indicator of the within-city mobility of children with special needs.

**Results**

Table 1 shows the percentage distribution of special- and general-education children across 12 variables; the distribution of the total number of live births in New York City during 1980 (the year of...
birth for the majority of the study sample) across the same variables is shown for comparative purposes. Special-education children were far more likely to be Black males whose unmarried mothers lacked formal education beyond high school and who had Medicaid coverage at the time they gave birth.

Presented in Table 2 are some of the same variables stratified by both race and educational placement. “Sex,” “mother’s education,” and “medical complications” continue to show a strong association with educational placement (i.e., the pooled odds ratios exceed 2) when the effects of race are controlled statistically. However, the degree of association between educational placement and Single Mother or Medicaid Coverage is so different between racial groups as to dictate against estimating a common odds ratio. Among Black children in this study, Medicaid coverage appears to be unrelated to educational placement.

Stepwise linear logistic regression (Table 3) was performed with 12 key variables to identify a set of minimally redundant variables that could best predict educational placement. Regardless of whether forward selection or backward elimination methods were employed, or whether variables were treated as categorical or numeric, the same three factors emerged: sex of child (SEX), Medicaid coverage at time of birth (MEDICAID), and one or more medical complications at birth (MEDCOMP). Because this function was estimated solely for purposes of prediction, no substantive interpretation will be given to the regression coefficients.

Classifying children by their sex, their mother’s Medicaid eligibility, and the presence or absence of medical complications at birth enabled us to correctly identify 25 out of 45 children in special education and, less importantly, 99 out of 116 children in general education.

**Discussion**

This pilot study suggests that certain health factors and sociodemographic characteristics that can be identified at birth are strongly associated with third graders’ educational placement. It would be worthwhile to apply a similar kind of analysis to a much larger sample that would be more representative of the city’s 32 community school districts. Specific risk factors can be expected to vary within diverse pupil populations, as was demonstrated in the present study with racial stratification.

Sex, Medicaid coverage, and medical complications, taken together, were the risk factors most strongly associated with educational placement in the regression analysis. Although controversy remains as to whether biological or sociological factors determine why more boys than girls end up in special education classes, extensive data suggest that males are more likely to be candidates for special education for biological reasons.

The preliminary results presented in Table 4 imply that one in every three children whom we can identify as being at risk for special education will eventually require it. This implication, in turn, suggests that prognostic methodologies such as the one described here can be employed to supplement the traditional indicators for medical assessment, rather than to replace accepted methods for screening and evaluating newborns and preschoolers with known biological risks. Classification procedures like those employed here can nevertheless aid in more precisely identifying newborns who should be followed continuously and screened periodically and who should receive supportive services. Such interventions should significantly reduce the chances that early vulnerability will progress to later disability, which will be more difficult and costly to treat.

**Acknowledgments**

The authors thank Jean Lee, Marge Manley, and the cooperating school health staffs who made this study possible.

This paper was presented at Prevention '90 Conference in Atlanta, Ga., March, 1990.

**References**