



## Narrowing the Income Gaps in Preventive Care for Young Children: Families in Healthy Steps

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**ABSTRACT** *Persistent unmet preventive and developmental health care needs of children in low-income families are a national concern. Recently, there have been efforts to promote developmental services as part of primary care for all young children. However, there is limited research to determine whether the neediest families are well in universal interventions. In our study, we assessed if disparities persist in utilization of developmental services, well child care, and satisfaction with care among low-, middle-, and high-income families participating in Healthy Steps for Young Children. Healthy Steps is a national experiment that incorporated developmental services into primary care for children from birth to 3 years of age. In the United States, 15 pediatric practices participated in this prospective study. At birth, 2,963 children were enrolled between September 1996 and November 1998 and followed through 33 months of age. The utilization of developmental services, satisfaction with care, and receipt of age-appropriate well child visits were measured at 30–33 months and adjusted for demographic and economic covariates. We found that the adjusted odds of low-income families did not differ from high-income families in receipt of four or more Healthy Steps services, a home visit, or discussing five or more child rearing topics. Low- and middle-income families had reduced adjusted odds of receiving a developmental assessment and books to read. The adjusted odds of low- and middle-income families did not differ from high-income families in being very satisfied with care provided or receiving age-appropriate well child visits. A universal practice-based intervention such as Healthy Steps has the potential to reduce income disparities in the utilization of preventive services, timely well child care, and satisfaction with care.*

**KEYWORDS** *Child development, Income disparities, Preventive child health services.*

Pediatric primary care settings are ideally positioned to provide preventive, behavioral, and developmental services as part of routine well child care.<sup>1–4</sup> Generally, children and their families are in regular contact with pediatric clinicians, and these professionals are trusted sources of information and advice on child health and development for families. A national survey of parents with young children documented that, regardless

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of income, parents are interested in receiving enhanced preventive health services to promote their children's healthy development.<sup>5</sup> Yet, many young children are not receiving preventive developmental services, and disparities by income persist.<sup>6</sup>

Young children growing up in low-income families are more likely to have unmet health care needs than children in more advantaged families. Low-income children have fewer physician visits, less continuous care,<sup>7</sup> less timely preventive care,<sup>8-10</sup> lower levels of primary health care service utilization,<sup>11,12</sup> and more unaddressed needs regarding preventive child health services and anticipatory guidance<sup>13</sup> than their more affluent counterparts. Low-income parents also are less likely to report that they discuss a number of child-rearing topics with health care professionals and are more likely than their more affluent counterparts to be dissatisfied with the care they received from their child's clinician and with how well the clinician listened to or answered their questions.<sup>14</sup>

Recently, there have been a number of efforts to promote preventive and developmental services as a part of pediatric primary care.<sup>15</sup> One national effort to incorporate developmental services in pediatric primary care is Healthy Steps for Young Children.<sup>16</sup> Healthy Steps is a universal program based on a model of pediatric practice that provides enhanced preventive developmental and behavioral services for families with children from birth to 3 years of age. It incorporates developmental specialists (Healthy Steps Specialists) into the pediatric teams, providing enhanced well child care and home visits. Other components include telephone information lines about child development, child development and family health checkups, informational materials for parents, parent support groups, and linkages to community resources.

Healthy Steps, developed by faculty at the department of Pediatrics of Boston University School of Medicine in Massachusetts, was designed to benefit all families, not just those at risk, recognizing that all parents have concerns about their young child's health and development. The results of a national evaluation of Healthy Steps demonstrated that intervention families, regardless of income, were more likely to use developmental services, receive timely well child care, and report satisfaction with the care they and their children received compared to control families.<sup>17,18</sup>

The ability of a universal program to provide developmental services and well child care and in turn increase satisfaction of low-income families is largely unknown. Limited research has been conducted to explore whether the neediest families are well served in a universal nontargeted intervention such as Healthy Steps.<sup>19,20</sup> In some cases, primary preventive programs, such as immunization or injury prevention programs, are provided to all young children. But, generally speaking the vast majority of preventive early intervention program and their evaluations are targeted to a subset of parents and children. These programs are based on criteria of need such as low income or single or teenage parenthood.<sup>19,21,22</sup> A recent study of child health services in Brazil suggested that universal programs actually increase inequities in child health between low- and high-income families, postulating that interventions reach high socioeconomic families before they are accessed by lower income families.<sup>23</sup>

Our study addressed an important gap in knowledge about the ability of universal programs to reduce income disparities. We examined whether low-, middle-, and high-income families who were eligible for Healthy Steps services varied in their utilization of developmental services and well child care and whether these families reported different levels of satisfaction with the care they received.

## METHODS

### Data Sources

The design of the Healthy Steps evaluation involved multiple data sources collected longitudinally on a sample of intervention and control families at 15 pediatric practices in 14 states across the country.<sup>24</sup> Four data sources were used in the analyses reported here. First, a newborn questionnaire, completed by parents at time of entry into Healthy Steps, included data on sociodemographic characteristics. Second, a telephone interview, when the child was 2–4 months, provided information regarding family income and mother's employment. Third, a telephone interview when the child was 30–33 months of age detailed the family's use of Healthy Steps services and the parent's satisfaction with the care provided by physicians, nurse practitioners, and the Healthy Steps Specialists. Response rates to the two surveys were 88% and 67%, respectively. Fourth, medical records were abstracted through 32 months of age and included type, content, and date of visits for 97% of the sample. A random sample of approximately 5% of the records was reabstracted at each site. Percentage agreement was 87% or higher for visit type and 96% or higher for visit date.

### The Study Sample

Staggered enrollment of families into the Healthy Steps evaluation began in September 1996 at the first site and ended at the last in November 1998. Of the 15 Healthy Step sites, 8 (53%) were located in large urban areas, 6 in small cities (40%), and 1 in a rural location (7%). Our sample for analysis included only families that received the Healthy Steps intervention; 2,963 families were initially enrolled in the Healthy Steps intervention. Eligibility criteria for the analyses reported here included participation in the interviews at 2–4 and 30–33 months and reported or imputed family income from the interview at 2–4 months. There were 1,910 families (64.5%) who met these criteria.

Data to form the income groups for comparisons of the receipt of services and satisfaction with care were obtained from the interview at 2–4 months. Because of its sensitive nature, the income question asked the respondent to indicate the highest level (using categories) for which the total family income was less than the stated amount. The midpoint of the income between that category and the next lowest one was taken as the family income. For respondents who refused to answer this question ( $N=572$ ), but for whom data on monthly expenditure on rent or mortgage were reported, family income was imputed from a regression of family income on monthly rent or mortgage, and the covariates were used in the analyses reported here (see list below). The vast majority of respondents answered the monthly rent/mortgage question.

Tertiles of income were formed using household income data from the interview at 2–4 months. The tertile cutoff values were less than \$20,000, \$20,000–49,999, and \$50,000 or more for low-, middle-, and high-income families, respectively. Tertiles were selected because they maximized our ability to take account of site differences: The middle-income group included families from all sites, and the low- and high-income groups included few families in some selected sites. By definition, roughly one third of the sample was found in each income group at 2–4 months. At 30–33 months, the higher income families (at 2–4 months) were overrepresented because of their higher response rates to the interview. Accordingly, the sample for comparisons by family income included 507 (26.5%) low-income, 665 (34.8%) middle-income, and 738 (38.6%) high-income families.

## Study Variables

Use of Healthy Steps services and satisfaction with services were measured at both interviews (at 2–4 and 30–33 months); because the results were similar for both time periods, only the data from the interview at 30–33 months are reported here. The measures at 30–33 months included receipt of four or more Healthy Steps services, receipt of a home visit, and discussion of five or more child-rearing topics since the baby was 6 months of age (Table 1). Three other variables represented receipt of additional services offered in Healthy Steps: a developmental exam, children's books to read, and information about community resources.

Four measures of satisfaction with care at 30–33 months included someone at the practice went out of the way for them; perception that clinicians do not listen to parents; perception that clinicians do not support parents; and satisfaction with Healthy Steps services from the Healthy Steps Specialist. We focused on responses at the low end of the scale, or dissatisfaction with care, because satisfaction was high among all families. The items in the scales defining the satisfaction variables

**TABLE 1. Selected parent survey outcome variables, 30–33 months**

Outcome variable	Items
Received 4 or more Healthy Steps services	Parent support groups; office visits about baby's development; office visits about taking care of the baby; telephone number to discuss baby's development; letter to prepare for office visits; brochures about baby's development; special health booklet (Cronbach $\alpha$ .66)
Discussed 5 or more of 10 topics	Importance of regular routines; sleep problems; discipline; language development; toilet training; sibling rivalry; home safety; child's development; child's temperament; ways of helping child learn (Cronbach $\alpha$ .92)
Disagree that clinicians provided "support" to parents (6 items)	Physicians/nurse practitioners suggested things I could do for child that fit into my family's daily life; helped me get all the information I need about child's growth and development; helped me get services for child from other agencies about programs; gave me advice on how to solve problems at home with child; gave me new ideas about things to do with child; pointed out what I did well as a parent (Cronbach $\alpha$ .87)
Disagree that clinicians "listened" to parents (7 items)	Physicians/nurse practitioners always had time to answer my questions about child; seemed to have other things on their minds when I talked with them; acted like I couldn't understand information about child's growth and development; seemed to think carefully about my questions about child's development; were always in a rush when they saw child; encouraged me to ask questions about child's growth and development; did not really give me a chance to ask questions about child (Cronbach $\alpha$ .87)
Very satisfied with care received from Healthy Steps Specialist (9 items)	Written information about the child's health and development; friendliness and care; attention paid to what you had to say; opportunity you had to ask questions; explanations about child's health and development; how capable the Healthy Steps Specialist was in working with you to promote child's health and development; support you received regarding your role as a parent; amount of time spent with you; information from developmental assessments (Cronbach $\alpha$ .93)

are shown in Table 1. The Cronbach  $\alpha$  exceeded .85 for all satisfaction variables, indicating high internal consistency.

The receipt of an age-appropriate well child visit was measured from medical records for the Healthy Steps intervention children at 1, 2, 4, 6, 12, and 24 months of age. The denominator for each visit included all children who made any type of visit during the age-appropriate window or in the interval just before or just after the age-appropriate window. This denominator was used to ensure that the child was still eligible for a well child visit at the practice.

### Analyses

Comparisons were made on the use of services and satisfaction with care among the three income groups using the  $\chi^2$  test. Multiple logistic regression was next used to adjust for covariates to assess whether the differences among income groups were caused by the covariates. Covariates included the mother's age, race (black), ethnicity (Hispanic), marital/partner status (father in the home), employment, whether the mother was a first-time parent, the child's insurance status (public, unknown, private, and self-pay), whether the child had a low birth weight, whether the child was enrolled in the evaluation in the hospital rather than the first office visit, the father's employment, and whether the family owned their home. In addition, multiple logistic regression analyses adjusted for the site of care for the child because site was confounded with income, and as a result, income differences may have been caused by difference practice patterns at sites.

## RESULTS

### Demographic Characteristics of the Sample

Families enrolled in Healthy Steps for Young Children had comparable income distributions as families with children under 6 years of age in 1997 in the United States.<sup>24</sup> As expected, mothers in low-income families were disproportionately young, non-white, more likely to be Hispanic, without a high school education, not employed, and not married (Table 2). There were no significant differences by income in parenting experience or birth weight of the baby.

### Receipt of Developmentally Related Services

At 30–33 months and across the three income groups, over 70% of parents reported receiving multiple developmental services, and the large majority of parents were satisfied with the care provided to their child. The percentages of families who received four or more Healthy Steps services (77.1% and 80.6%, respectively) and any home visit (74.2% and 75.5%, respectively) did not differ between low- and high-income families. However, middle-income families were significantly less likely to receive four or more services (74.2%) or any home visit (69%). Low- and middle-income families were less likely to report discussing five or more child-rearing topics with their child's clinician (84.3% and 85.6%, respectively, vs. 90% for high-income families), receiving a developmental assessment (79% and 80%, respectively, vs. 88.6% for high-income families), and receiving books (80.2% and 83.9%, respectively, vs. 90.5% for high-income families). Across the three income groups, 75% to 94% of mothers reported discussing 8 of the 10 individual child-rearing topics. There were no differences in the percentages of families receiving information about community services among the low-, middle-, and high-income groups (44.6%, 48%, and 51.6%, respectively).

**TABLE 2. Demographic characteristics of the sample at time of child's birth by income group (%)\***

Demographic characteristics	Income at 2–4 months			
	Low (N = 507)	Middle (N = 665)	High (N = 738)	Total (N = 1,910)
Mother's age, years†				
Less than 20	27.3	8.9	2.2	11.2
Between 20 and 29	57.1	57.2	33.5	48.0
Greater than 29	15.6	33.9	64.3	40.8
Mother's education level†				
Less than high school	33.3	8.6	1.6	12.5
High school graduate	38.2	30.6	10.7	25.0
Some college or vocational school	24.2	35.4	25.8	33.8
College graduate	4.4	25.3	61.9	28.7
Mother's employment†				
Employed	26.0	43.8	38.7	37.1
Not employed	74.0	56.2	61.3	62.9
Child's insurance†				
Public	83.0	31.3	8.5	36.2
Private	11.7	65.6	90.4	60.9
Unknown	5.4	3.2	1.1	2.9
Home ownership†				
Owns home	31.2	53.5	79.1	57.5
Rents home or apartment	68.8	46.5	20.9	42.5
Mother's marital status†				
Living with the father, married	36.2	71.5	89.9	69.3
Living with father, not married	21.7	11.4	3.2	10.9
Not living with father, married or not married	42.0	17.2	6.9	19.7
Mother's race†				
White	37.0	64.9	82.4	64.4
Black/African American	40.2	22.6	9.7	22.2
Asian/Native American/other	22.7	12.6	7.9	13.4
Mother's ethnicity†				
Hispanic	27.3	17.1	9.9	36.1
Non-Hispanic	72.7	82.9	90.1	63.9
Parenting experience				
First-time mother	49.3	48.0	52.2	50.0
Second-time or greater mother	50.7	52.0	47.8	50.0
Birth weight				
Low birth weight (<2,500 g)	8.4	5.7	6.2	6.6
Normal birth weight	91.6	94.3	93.8	93.4

\*Less than 5% missing data.

† $P < .001$ .

The unadjusted odds in Table 3 are consistent with the frequencies cited above. The adjusted odds of a low-income family receiving four or more Healthy Steps services, a home visit, discussing five or more topics, or receiving information about community resources did not differ from the odds of a high-income family receiving

TABLE 3. Utilization of Healthy Steps services and satisfaction with care at 30–33 months, odds ratio (95% confidence interval)

Outcome variables	Low income*		Middle income*	
	Unadjusted	Adjusted for covariates and site	Unadjusted	Adjusted for covariates and site
Healthy Steps services				
Received four or more Healthy Steps services	0.81 (0.61–1.08)	0.69 (0.44–1.09)	0.69 (0.53–0.9)†	0.64 (0.47–0.89)†
Received a home visit	0.93 (0.72–1.21)	0.97 (0.64–1.48)	0.72 (0.57–0.92)†	0.80 (0.60–1.07)
Discussed five or more topics	0.60 (0.42–0.86)†	0.66 (0.38–1.17)	0.66 (0.47–0.93)‡	0.74 (0.49–1.10)
Had developmental assessment	0.48 (0.35–0.67)§	0.54 (0.32–0.91)‡	0.54 (0.39–0.74)§	0.56 (0.38–0.83)†
Received books to read	0.43 (0.30–0.60)§	0.55 (0.32–0.94)‡	0.55 (0.39–0.77)§	0.62 (0.42–0.92)‡
Received information about community resources	0.76 (0.59–0.96)‡	0.96 (0.65–1.42)	0.87 (0.69–1.09)	1.04 (0.79–1.37)
Satisfaction with care				
Someone went out of the way to help	0.72 (0.56–0.92)†	0.92 (0.61–1.38)	0.87 (0.68–1.10)	0.92 (0.69–1.22)
Disagree that clinicians provided “support” to parents	0.67 (0.43–1.05)	0.87 (0.43–1.77)	1.00 (0.68–1.48)	1.33 (0.82–2.17)
Disagree that clinicians “listened” to parents	1.30 (0.88–1.94)	1.95 (1.02–3.76)‡	1.00 (0.68–1.48)	1.33 (0.82–2.17)
Very satisfied with care received from Healthy Steps Specialist	0.60 (0.45–0.82)	0.85 (0.53–0.91)	0.81 (0.61–1.09)	0.94 (0.66–1.34)

\*Reference category is high-income group.

† $P < .01$ .

‡ $P < .05$ .

§ $P < .001$ .

these services (Table 3). The same was true for middle-income families, except that the adjusted odds of the middle-income families' receipt of four or more Healthy Steps services was nearly one third less than the odds for high-income intervention families. In terms of other developmental services, the adjusted odds of low- and middle-income Healthy Steps parents reporting receiving books to read or someone doing a developmental assessment was close to 50% less than the odds for parents in the high-income Healthy Steps intervention group.

### Satisfaction With Their Child's Health Care

At 30–33 months, there were no significant differences between low- or middle-income families and high-income families in the percentage disagreeing that clinicians provided support (7.8%, 10%, and 11.2%, respectively), disagreeing that clinicians listened to them (11.1%, 8.8%, and 8.7%, respectively), or being very satisfied with care received by the Healthy Steps Specialist (75.6%, 80.6%, and 83.7%, respectively). Although a smaller percentage of low-income families reported that someone in the child's primary care practice went out of the way for them (63.6% vs. 67.8% and 70.8%), the adjusted odds ratio did not differ for low- and high-income families on this variable (Table 3). Low-income intervention families, however, had nearly two times the odds of disagreeing that clinicians listened to parents, after adjusting for covariates and site (Table 3).

### Utilization of Age-Appropriate Well Child Visits

The frequencies of low-, middle-, and high-income families utilizing age-appropriate well child visits at 1, 2, 4, 6, 12, 18, and 24 months ranged from 70.1% to 98.4%, with variation in frequencies occurring by income group at all times except 1 month. Utilization was highest at the youngest ages for all groups. There were no significant differences in the adjusted odds ratios for low- or middle-income families of an age-appropriate well child visit at 1, 2, 4, 12, 18, and 24 months compared to high-income Healthy Steps intervention families (Table 4). At 6 months, the adjusted

**TABLE 4. Age-appropriate well child visits among Healthy Steps families, odds ratio (95% confidence interval)**

Outcome variable	Low income*		Middle income*	
	Unadjusted	Adjusted for covariates and site	Unadjusted	Adjusted for covariates and site
Received visit				
1 month	0.59 (0.27–1.28)	0.91 (0.27–3.08)	0.97 (0.43–2.22)	1.28 (0.49–3.40)
2 months	0.26 (0.16–0.43)†	0.67 (0.32–1.41)	0.49 (0.30–0.81)‡	0.65 (0.36–1.18)
4 months	0.33 (0.23–0.47)†	0.77 (0.43–1.35)	0.61 (0.42–0.89)†	0.86 (0.55–1.35)
6 months	0.28 (0.19–0.40)†	0.48 (0.28–0.83)‡	0.51 (0.36–0.74)†	0.63 (0.41–0.97)§
12 months	0.43 (0.29–0.64)†	0.72 (0.39–1.34)	0.61 (0.41–0.91)§	0.75 (0.47–1.19)
18 months	0.41 (0.30–0.55)†	0.85 (0.52–1.39)	0.59 (0.44–0.79)†	0.90 (0.63–1.29)
24 months	0.62 (0.44–0.89)‡	1.14 (0.63–2.05)	0.75 (0.53–1.05)	0.89 (0.58–1.37)

\*Reference category is high-income group.

§ $P < .05$ .

‡ $P < .01$ .

† $P < .001$ .



odds ratio was about 50% lower for low-income families and about one third lower for middle-income families than for high-income families.

## DISCUSSION

In this study, we examined if there were differences by income in the utilization of developmental and preventive health care services and parent satisfaction among families who participated in the Healthy Steps intervention. Our interest was to determine whether a universal approach built on parent support and education, anticipatory guidance, and the integration of preventive developmental and behavioral health services into pediatric primary care might decrease disparities in utilization of services and satisfaction with care between low- and high income families.

The results indicated that low-income families in Healthy Steps were as likely to receive four or more preventive or developmental services as high-income families, and that low- and middle-income families were as likely to receive a home visit and information about community resources and to discuss five or more child-rearing topics with their child's clinician as high-income families. Low- and middle-income group parents largely reported similar levels of satisfaction with the care received as high-income parents even without adjustments for covariates. The one exception was related to providers listening to them, for which dissatisfaction was greater for low-income parents after adjustment for covariates.

Disparities still persisted, however, in the odds of receiving a developmental assessment and provision of books to read to the child, with low- and middle-income families having lower odds of being provided with these services. Although the results suggest that middle-income families were less likely to receive four or more Healthy Steps services than more affluent families, it should be noted that the frequencies are similar and in the same direction in five of the six services for which statistical differences were found. We speculate that the reason for this finding is that, in this country, middle-income children and families often fall through the cracks. Middle-income families are not able to access government-funded services such as Head Start or home visiting programs that are available for low-income children and families. On the other hand, middle-income families may not have the financial resources or savvy of more affluent families to purchase parent support services.<sup>23</sup>

Our findings suggest similar odds of timely receipt of well child care for low-income families as high-income families only after adjustment for family demographic variables and site. The remaining difference in adjusted odds for the 6-month visit and other developmental services may be attributed to other unmeasured family characteristics, such as work schedules or family stress. Even among Healthy Steps families, income disparities in receipt of some preventive developmental services remained.

A number of limitations to this study should be noted. First, the Healthy Steps practices were selected to participate in the evaluation, in part, because they demonstrated delivery of high-quality pediatric primary care services. Thus, the high levels of satisfaction might be explained partly by participation of high-quality practices.<sup>17</sup> Second, the use of a telephone interview may have resulted in a more advantaged sample of families on the basis of other variables such as work status or education.<sup>17</sup> Third, many studies indicated that parents generally have high favorability ratings of the physicians who care for their children,<sup>25</sup> such that differences in satisfaction ratings among the income groups could be obscured by high satisfaction ratings by parents in general.

Because children in low-income families are at greater risk for medical and psychosocial problems, they stand to benefit more than their more affluent counterparts if they receive developmental and preventive care.<sup>26</sup> It is disappointing to note that low- and middle-income families reported that they were less likely to receive developmental assessments, particularly because previous studies of the Medicaid-affiliated Early and Periodic Screening, Diagnosis, and Treatment program (EPSDT) program suggest that developmental screening of low-income children can result in reductions in the prevalence of problems that require later care. Studies indicated that families are more likely to utilize health services when they reflect the real and perceived needs of families.<sup>8</sup> The family focus provided through Healthy Steps likely contributed to the successful receipt of services by low-income families.

The comparable levels of satisfaction with care reported by families across all income groups are important to consider, especially since many studies have indicated greater satisfaction with and utilization of medical care among higher social class and income families.<sup>14,27,28</sup> Mothers' satisfaction with health care has been shown to be a significant predictor of up-to-date immunizations for their children.<sup>29</sup> Although the direction of the effect between satisfaction and receipt of services is not always clear,<sup>29</sup> these findings suggest that improved perceptions of health care delivery systems may ultimately be associated with increased use of preventive health services. Additional analyses are being done to test this hypothesis.

It is of interest to both clinicians and policymakers to know whether targeted or universal strategies would be successful in reducing inequities in health care utilization for low-income children and families. Targeted programs often have the disadvantage of stigmatizing an intervention package and are vulnerable to shifting political priorities. A recent study has suggested that universal interventions tend to maintain or even increase inequities as a result of greater utilization of services by relatively affluent children and families who would have access to preventive services, even in the absence of an intervention.<sup>23</sup> In contrast, the findings from this study suggest that a universal approach such as Healthy Steps can begin to narrow the income gaps in utilization of preventive health services, timely well child care, and satisfaction with care for families with young children.

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