Morbidity and Use of Ambulatory Care Services among Poor and Nonpoor Children

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Abstract: Using data from the Child Health Supplement to the 1981 National Health Interview Survey, illness and use of physician services are compared for children under 18 years old in three family income groups. The results indicate that although annual prevalence of many health problems does not differ greatly by income level, disability as measured by bed days is greater among low income children. A substantial minority of children from all socioeconomic levels are afflicted by multiple health problems. The impact of multiple conditions, as measured by days spent ill in bed, appears much greater for children from low income families. Use of physician services was found to be similar for children of all socioeconomic levels when no significant health problems were present, but low income children with health problems used fewer physician visits on an adjusted basis than their higher income counterparts. (Am J Public Health 1988; 78:927–933.)

Introduction

Studies using nationally representative samples of children have demonstrated that children from low income households are more frequently reported to be limited in their usual activities because of chronic health problems, spend more days in bed because of injury or illness, and are more likely to be reported as in only fair or poor overall health by their parents.[1-7] While useful, such measures reflect global health status and provide little specific information about the types of health problems experienced by children of different economic backgrounds. For example, little is known about the degree to which illnesses cluster among children of different socioeconomic backgrounds. Such information about the distribution of ill health could facilitate the planning and evaluation of interventions aimed at reducing health status differentials between poor and nonpoor children.

Most health surveys focus primarily on measurement of the health problems of adults or, at best, the population of all ages. As a result, the data have somewhat limited value when used to assess *children's* health status. This situation changed in 1981, when a large national survey was fielded expressly for the purpose of measuring children's health and well-being. This survey, the Child Health Supplement to the National Health Interview Survey, collected extensive and detailed information on the health status of over 15,000 children, including a detailed checklist of common childhood illnesses and impairments.[8,9] The relatively large sample combined with this lengthy checklist provided an opportunity to examine children's health problems in a more comprehensive fashion than was possible from past national surveys. In addition, data from the Child Health Supplement permit analysis of prevalence of health problems by family income level and a comparison of ambulatory care use for different types of childhood conditions.

Using data collected by the Child Health Supplement we grouped sample children by family income level and types of conditions reported and assessed differences in prevalence according to socioeconomic status. In addition, we assessed the degree to which illnesses cluster in different socioeconomic groups, and how clustering of illnesses is related to use of ambulatory care services.

Methods

The survey was administered to a probability sample of 41,000 households in all 50 states and the District of Columbia by Census Bureau interviewers working under an interagency agreement with the National Center for Health Statistics.[9] The questionnaire contained extensive probes on family background, prenatal care, child care, motor and social development, and a variety of other topics related to child health (a replica of the questionnaire is published in reference number 8). In each household with one or more children, one child was selected at random to be the subject of an interview; interviews were completed for 15,416 children under 18 years old. The overall response rate exceeded 93 per cent. Parents served as the respondents for 92 per cent of the interviews; children over age 16 were asked to respond for themselves when possible. When the child's age or availability precluded responding to the interview, mothers were selected as respondents whenever possible on the assumption that they were most familiar with the child's health. Some degree of bias should be expected when parents respond on behalf of children; conditions or medical care visits that a parent is unaware of or finds embarrassing may be underreported.

Of particular importance for our purposes was the inclusion of a detailed checklist of childhood health problems. The checklist was designed to ascertain prevalence of common childhood physical health problems as well as many conditions that occur infrequently in childhood. Probes were included to ascertain prevalence of 99 childhood health conditions including common ones such as tonsillitis and rare ones such as cystic fibrosis. Because the purpose of the instrument was to ascertain whether the child had ever had any of the checklist conditions, minor acute illnesses, such as colds, influenza, or minor injuries, were excluded from the checklist. The known underreporting of mental and nervous conditions[10] led to the exclusion of all but "mental retardation" on the checklist. We restricted our analysis to conditions that were present during the year prior to the interview. As a result, our estimates presented here refer to the proportion or prevalence of children reported to have a given condition during the year.

Due to sample size considerations and low prevalence, checklist conditions were grouped into several "morbidity categories" (broadly defined to include illnesses and impairments) based upon those used in a prior study of children enrolled in one health maintenance organization.[11] This

categorization scheme was originally developed to examine the relationship between ill health and use of services over long periods of time. Children who were persistently high users of services were found to be more likely to have multiple types of morbidity than other children.[12] These conclusions were confirmed by a separate study in which the source of information was parental report on household interview and physical examination of the child rather than the medical record.[13] This latter study also demonstrated that children with persistently high use of services were also more likely to have high levels of disability, abnormalities in physical examination, and to have higher scores in a mental problem inventory, a social health inventory, and a general health rating inventory.

As the condition list of the Child Health Supplement did not contain all possible conditions children could experience and was particularly deficient in certain acute self-limited conditions, injuries and psychosocial problems, the original categorizations were modified. Psychosomatic conditions were subsumed in a symptoms and signs category and the injuries category was eliminated; where certain usually acute conditions (such as hepatitis and meningitis) were reported as present more than three months they were categorized as acute-likely-to-recur (rather than acute) conditions; conditions reported as "other _____ " (such as other digestive conditions or other respiratory diseases) were categorized as acute self-limited if present three or fewer months and as chronic medical if present more than three months. A list of the 10 morbidity categories used in this analysis and the Child Health Supplement conditions included in each is presented in Appendix A.

Sample children were grouped into three income categories based on reported family income from all sources (excluding noncash benefits such as public housing and subsidized medical care): 20.2 per cent were classified as low income (less than $10,000); 42.4 per cent were classified as moderate income ($10,000 to $24,999); and, 37.5 per cent were classified as high income ($25,000 or more). Income data were collected in large interval categories (e.g., $10,000 to $14,999) making it impractical to compute poverty status or other income measures adjusted for family size. Although not adjusted for family size, the $10,000 cutoff for the low income group is very close to the official US poverty threshold of $9,287 for a family of four in 1981. A total of 1,209 sample children with unknown family incomes was excluded from the income-related analysis but included in the table totals. Comparison of sample children with known and unknown family incomes indicated that sample children with unknown family incomes tended to exhibit slightly better health status on average than sample children with known income levels. Since no cross-checks of medical records were performed on the data obtained from the Child Health Supplement, it is impossible to determine whether recall errors or other response errors varied by family income level. Previous studies of National Health Interview Survey interviewing methods for adult respondents suggest that under-reporting of chronic conditions increases with income but no significant income differences exist in reporting of physician contacts.[14]

Once children were categorized according to family income level, they were further classified into morbidity categories (including no reported checklist conditions) for purposes of analysis. It should be noted that while the income categories are mutually exclusive, the morbidity categories are not; for example, a child may have been reported to have both asthma and a dermatologic condition during the year prior to the interview. The degree to which children of different family income levels have overlapping or multiple conditions is reported separately in the tables.

We also examined the impact associated with checklist conditions by reporting average numbers of days spent ill in bed during the year and annualized numbers of physician contacts for children in each income and morbidity category. The estimates of bed days and physician contacts are based on questions with a two-week recall period (the short recall period is designed to increase reliability). Responses to these two-week recall questions were weighted to reflect annualized totals. Because of the questionnaire wording used in the interviews, these measures reflect days spent ill in bed and physician contacts for all diagnoses that a child may have had prior to the interview, including conditions not included in the checklist, such as a common cold.

Caution is required in interpreting the results from these illness impact measures for two reasons. First, because the bed day and physician contact measures are not condition-specific, the reported values for any morbidity category may include bed days and physician contacts for conditions not included in that category. Second, comparisons of the impact measures among morbidity categories are likely to be confounded by the effects of age. Use of ambulatory care services, particularly supervisory care, is associated with age independent of morbidity status. If the prevalence of a condition is also associated with age, as are repeated ear infections and allergies, some of the differences observed among morbidity categories may be attributable to age rather than illness.

We attempted to address these problems by estimating bed days and physician contacts for each morbidity category while controlling for age and number of conditions reported. However, the number of cases in several of the morbidity categories was insufficient to produce stable estimates. While the overall sample is quite large (15,416), the number of cases for any particular combination of income class and morbidity category can be relatively small (see Appendix B). We attempted to circumvent the sample size problem by collapsing the original 10 morbidity categories into five larger categories. After doing so, we reanalyzed the bed day and physician contact data while controlling for age and number of conditions reported. In general, the pattern of results from this subanalysis was quite similar to those reported here. (Results available from the authors on request.) Nevertheless, readers should exercise caution in comparing bed days and physician contact rates among morbidity categories because of the confounding effects of age. Comparisons of bed days and physician contacts by income class within a single morbidity category should be less problematic since within individual morbidity categories, the mean ages of children in each income class are similar.

Estimates presented in the text and tables are statistically weighted to reflect national population totals. Estimates presented here could vary from the values that would have been obtained in a complete census. To provide the reader with a sense of sampling variability, standard errors are displayed in the tables. Since the Child Health Supplement was based on a multistage stratified design that results in clustering of sample respondents, these standard errors were computed based on a computer algorithm that incorporates sample design effects.[15,16]

TABLE 1—Per Cent of Children under 18 Years of Age with Given Morbidity Category in 1981

Morbidity Category	Income			
	All*	Low	Moderate	High
1. Acute Self-Limited	3.9	4.9	4.1	3.4
	(0.2)	(0.6)	(0.3)	(0.3)
2. Allergies	12.0	7.8	11.7	15.7
	(0.3)	(0.5)	(0.5)	(0.6)
3. Asthma	3.2	4.5	2.8	2.7
	(0.2)	(0.5)	(0.3)	(0.2)
4. Repeated Ear Infections	8.0	8.2	8.0	8.0
	(0.3)	(0.6)	(0.4)	(0.5)
5. Tonsillitis	5.5	5.7	5.4	5.4
	(0.2)	(0.5)	(0.4)	(0.4)
6. Acute, Likely-to-Recur	3.4	3.2	3.5	3.5
	(0.2)	(0.4)	(0.3)	(0.3)
7. Chronic Medical	6.9	7.8	6.7	6.9
	(0.2)	(0.6)	(0.3)	(0.4)
8. Chronic Specialty	9.6	10.6	9.8	9.5
	(0.3)	(0.7)	(0.5)	(0.4)
9. Dermatologic	2.8	1.6	2.7	3.9
	(0.1)	(0.2)	(0.2)	(0.3)
10. Symptoms/Signs/Other	8.2	9.3	8.2	8.0
	(0.3)	(0.9)	(0.4)	(0.5)
11. No Reported Conditions	58.1	59.8	58.5	55.1
	(0.9)	(2.2)	(1.2)	(1.3)

NOTES: *Includes unknown income.
Standard errors in parentheses.
SOURCE: Microdata from the 1981 National Health Interview Survey, Child Health Supplement.

Results

Prevalence

Overall, 42 per cent of all noninstitutionalized children under 18 years old were reported to have had a checklist condition in one or more of the morbidity categories during the year prior to the interview. The leading morbidity category was allergies which affected 12 per cent of all children during the year prior to the interview. The next most common categories included chronic specialty problems, symptoms and signs, repeated ear infections, and chronic medical conditions. The least common categories included dermatologic conditions, acute likely-to-recur conditions, and acute self-limited conditions. The latter two morbidity categories would be expected to be spuriously low, since, as indicated above, many of the more common but typically less severe acute conditions were not included on the checklist.

Based on previous studies of differences in health status by income level, it was expected that the proportion of children with conditions in each of the 10 morbidity categories would be inversely related to family income level. As shown in Table 1, the proportion appears to vary by income, but often not in the direction one might expect. Children from high income families appear slightly more likely to be reported as having at least one checklist condition (44.9 per cent) than children from low income families (40.2 per cent). However, of the 10 morbidity categories, only three appear to show a higher prevalence rate for high income children: allergies, dermatologic conditions, and acute-likely-to-recur conditions. For the other seven categories prevalence appears higher for low income children, or no substantial difference is apparent across income.

Although the data from the Child Health Supplement do not permit longitudinal analysis, it is possible to examine clustering of illness over the year prior to the interview. As

TABLE 2—Per Cent Distribution of Children under 18 Years of Age by Number of Morbidity Categories in 1981

	Income			
	All*	Low	Moderate	High
Children with no checklist conditions	58.1	59.8	58.5	55.1
	(0.9)	(2.2)	(1.2)	(1.3)
Children with conditions in one morbidity category	27.0	25.4	26.5	28.9
	(0.5)	(1.1)	(0.8)	(1.0)
Children with conditions in two or more morbidity categories	14.9	14.8	15.0	16.0
	(0.4)	(0.9)	(0.6)	(0.6)
All Children	100.0	100.0	100.0	100.0

NOTES: *Includes unknown income.
Standard errors in parentheses.
SOURCE: Microdata from the 1981 National Health Interview Survey, Child Health Supplement.

shown in Table 2, 58 per cent of children had no reported checklist conditions during the previous year, 27 per cent had reported checklist conditions in only one morbidity category, and 15 per cent had reported conditions in multiple morbidity categories. These data suggest that a substantial minority of children suffered from multiple types of health problems. No major differences in the prevalence of children with multiple types of health problems were apparent across family income level.

Bed Disability

Table 3 shows how bed days are distributed among children with conditions in each of the 10 morbidity categories as well as for children with no reported checklist conditions. A general pattern of fewer bed days with higher income is clearly visible. On average, reported bed days for economically disadvantaged children are twice those reported for high income children in five of the 10 morbidity

TABLE 3—Average Annual Days Spent Ill in Bed among Children under 18 Years of Age in 1981

Morbidity Category	Income			
	All*	Low	Moderate	High
1. Acute Self-Limited	14.8	25.7	14.3	6.3
	(2.5)	(7.2)	(2.6)	(1.6)
2. Allergies	6.7	11.3	7.5	5.0
	(0.6)	(1.9)	(1.2)	(0.7)
3. Asthma	12.7	14.2	15.7	8.9
	(1.8)	(3.8)	(3.8)	(2.2)
4. Repeated Ear Infections	10.4	20.2	10.9	4.7
	(1.1)	(4.3)	(1.5)	(0.8)
5. Tonsillitis	10.4	15.0	9.8	8.5
	(1.1)	(3.3)	(1.5)	(1.5)
6. Acute, Likely-to-Recur	8.4	14.8	7.3	7.3
	(1.5)	(5.2)	(2.1)	(2.3)
7. Chronic Medical	8.9	8.4	11.6	6.9
	(1.2)	(2.0)	(2.6)	(1.2)
8. Chronic Specialty	6.1	9.0	6.0	4.5
	(0.8)	(2.2)	(1.0)	(0.9)
9. Dermatologic	3.8	3.6	2.0	5.6
	(1.0)	(1.8)	(0.7)	(1.9)
10. Symptoms/Signs/Other	9.2	12.6	9.1	7.6
	(1.0)	(2.7)	(1.6)	(1.6)
11. No Reported Conditions	3.4	4.2	3.2	3.4
	(0.2)	(0.6)	(0.3)	(0.4)

NOTES: *Includes unknown income.
Standard errors in parentheses.
SOURCE: Microdata from the 1981 National Health Interview Survey, Child Health Supplement.

TABLE 4—Average Annual Days Spent III in Bed among Children under 18 Years of Age by Number of Morbidity Categories in 1981

	Average Annual Days in Bed			
	All Incomes*	Low Income	Moderate Income	High Income
Children with no checklist conditions	3.4	4.2	3.2	3.4
	(0.2)	(0.6)	(0.3)	(0.4)
Children with conditions in one morbidity category	6.0	7.7	6.9	4.2
	(0.4)	(1.2)	(0.9)	(0.5)
Children with conditions in two or more morbidity categories	9.9	16.9	9.5	7.1
	(0.7)	(2.5)	(1.0)	(0.9)
All Children	5.1	6.9	5.1	4.2
	(0.2)	(0.7)	(0.4)	(0.3)

NOTES: *Includes unknown income.
Standard errors in parentheses.
SOURCE: Microdata from the 1981 National Health Interview Survey, Child Health Supplement.

categories, and over four times as high among these experiencing acute self-limited conditions. Average bed days appear higher for children in more affluent families only among those with dermatologic conditions.

As might be anticipated, bed days were clustered in a subgroup of children (Table 4). Bed days progressively increased as the number of morbidity categories experienced by children rose. Children with conditions in only one morbidity category experienced about twice as many bed days as children with no checklist conditions and children with conditions in two or more morbidity categories experienced almost three times as many bed days. Substantial differences in clustering of bed days are also visible for children of different socioeconomic backgrounds (Table 4).

Differences become more and more pronounced as the number of reported morbidity categories increases. Children with illnesses in multiple morbidity categories accounted for a disproportionate share of bed days in each income category, but the disproportion was most concentrated among children in the low income group—where the 15 per cent of low income children with illnesses in two or more morbidity categories accounted for 36 per cent of all bed days reported.

Use of Ambulatory Care Services

Table 5 shows how use of physician services varied for children of different family income levels. Reported physician contacts included visits for all reasons, including checkups and other preventive services as well as telephone consultations, but exclude visits in hospital inpatient settings. The left side of Table 5 reveals higher average numbers of physician contacts for children from low income families in seven of the 10 morbidity categories. That is, without considering impact of illness, low income children appear to use more physician services on average than their higher income counterparts in most illness categories. The right side of Table 5 presents data on use of physician services adjusted for days spent ill in bed. These use-disability ratios are the ratio of physician contacts per 100 bed days for children in each morbidity category and income class. Hence, the ratios reflect use of physician services crudely adjusted for impact of illness—as measured by days spent ill in bed.[4]

The use-disability data suggest that, with the exception of children with dermatologic conditions, children from low income families use fewer physician services than children from high income families when this measure is considered. In eight of the 10 morbidity categories, high income children used at least 50 per cent more services on an adjusted basis than children from low income families. In three morbidity

TABLE 5—Use of Physician Services among Children Under 18 Years of Age in 1981

Morbidity Category	Physician Contacts per Year				Physician Contacts per 100 Bed Days per Year			
		Income				Income		
	All*	Low	Moderate	High	All*	Low	Moderate	High
1. Acute Self-Limited	11.0	13.7	11.8	8.7	74	53	83	138
	(1.1)	(2.5)	(1.4)	(1.6)	(15)	(18)	(18)	(43)
2. Allergies	6.6	8.9	6.7	6.0	99	79	89	120
	(0.4)	(1.1)	(0.7)	(0.5)	(11)	(16)	(17)	(20)
3. Asthma	8.1	7.7	8.9	9.0	64	54	57	101
	(0.8)	(1.6)	(1.4)	(1.3)	(11)	(18)	(16)	(29)
4. Repeated Ear Infections	8.9	11.8	9.6	7.0	86	58	88	149
	(0.6)	(1.7)	(1.1)	(0.7)	(11)	(15)	(16)	(29)
5. Tonsillitis	7.3	7.1	6.8	8.2	70	47	69	96
	(0.6)	(1.3)	(0.9)	(1.2)	(9)	(13)	(14)	(22)
6. Acute, Likely-to-Recur	6.7	8.4	6.4	7.0	80	57	88	96
	(0.6)	(1.6)	(1.0)	(1.3)	(16)	(23)	(29)	(35)
7. Chronic Medical	7.5	6.8	7.9	8.2	84	81	68	119
	(0.7)	(1.3)	(1.0)	(1.5)	(14)	(25)	(18)	(30)
8. Chronic Specialty	6.2	7.2	5.6	6.3	102	80	93	140
	(0.5)	(1.2)	(0.6)	(0.9)	(16)	(24)	(18)	(34)
9. Dermatologic	4.2	5.8	3.3	4.3	111	161	165	77
	(0.6)	(2.1)	(0.9)	(0.8)	(33)	(99)	(73)	(30)
10. Symptoms/Signs/Other	6.5	7.9	5.6	7.1	71	63	62	93
	(0.5)	(1.2)	(0.7)	(0.8)	(9)	(17)	(13)	(22)
11. No Reported Conditions	2.8	3.0	2.8	2.8	82	73	88	82
	(0.1)	(0.3)	(0.2)	(0.2)	(6)	(13)	(10)	(11)

NOTES: *Includes unknown income.
Standard errors in parentheses.
SOURCE: Microdata from the 1981 National Health Interview Survey, Child Health Supplement

TABLE 6—Use of Physician Services for Children under 18 Years of Age by Number of Morbidity Categories in 1981

	Average Annual Physician Contacts				Average Annual Physician Contacts per 100 Bed Days per Year			
	All Incomes*	Low Income	Moderate Income	High Income	All Incomes	Low Income	Moderate Income	High Income
Children with no checklist	2.8	3.0	2.8	2.8	82	73	88	82
conditions	(0.1)	(0.3)	(0.2)	(0.2)	(6)	(13)	(10)	(11)
Children with conditions in one	4.7	4.8	4.9	4.8	78	62	71	115
morbidity category	(0.2)	(0.4)	(0.4)	(0.4)	(6)	(11)	(11)	(17)
Children with conditions in two or	8.5	10.3	8.3	7.9	86	61	87	111
more morbidity categories	(0.4)	(1.0)	(0.6)	(0.6)	(8)	(11)	(11)	(16)
All Children	4.2	4.5	4.2	4.2	82	65	82	99
	(0.1)	(0.3)	(0.2)	(0.2)	(4)	(8)	(8)	(8)

NOTES: *Includes unknown income.
Standard errors in parentheses.
SOURCE: Microdata from the 1981 National Health Interview Survey, Child Health Supplement.

categories—acute self-limited, repeated ear infections, and tonsillitis—children from high income families had more than twice as many visits on an adjusted basis.

As with bed days, physician visits were concentrated within a subgroup of the child population (Table 6). Children with multiple morbidities were reported to visit physicians at nearly three times the rate for children without checklist conditions. Substantial differences in use of physician services adjusted for bed days were also apparent (Table 6). In all cases, low income children used fewer physician services on an adjusted basis than their higher income counterparts. The differences were relatively small for children with no checklist conditions but substantial for children with conditions in one or more morbidity categories.

Discussion

Our findings indicate the value of viewing ill health from a child perspective rather than from the perspective of the incidence or prevalence of particular conditions or types of conditions. A substantial minority of children from all socioeconomic levels are afflicted by multiple health problems even during a one-year period. The impact of multiple morbidities appears especially severe for children from low income households; those with illnesses in multiple morbidity categories experience four times as many bed days as those with no reported conditions. Low income children with illnesses in multiple morbidity categories are reported to spend twice as many days spent ill in bed as comparable children from high income families.

Use of physician services differs among children with illnesses who are from different socioeconomic backgrounds. Substantial inequities are apparent for children with illnesses in one or more morbidity categories. These findings are similar to those of other studies that have used perceived overall health status as the measure of morbidity. For example, low income children reported by a parent to be in good or excellent health see physicians at about the same rate as children in similar health from high income families, whereas low income children in fair or poor health use fewer physician services than higher income children in similar health.[6,7] The consistency of the findings from separate studies suggests the need for heightened efforts to improve access for low income children.

Inferences drawn from our data must be qualified by several caveats regarding the data and our methods of analysis. First, many common acute or acute self-limited conditions (such as colds and minor injuries) were purposely excluded from the checklist and therefore are not considered in our morbidity classification scheme. In addition, the checklist was deficient in conditions containing a psychosocial component, especially those related to behavioral and emotional health. However, a separate list of behavioral problems was included in the Child Health Supplement[8] and we assessed prevalence of children with behavioral problems according to family income level of children. Low income children were reported to suffer from more behavioral problems than children from higher income families (results available from the authors on request). This pattern is consistent with the results presented above showing that low income children suffer more severe physical health problems than children from higher income families.

Another problem concerns the absence of condition-specific illness impact measures. Their absence limits our ability to make valid comparisons of bed days and physician contacts among morbidity categories. However, we feel comparisons within individual morbidity categories are subject to considerably less bias. Another issue related to the impact measures concerns the use-disability ratios presented. While a commonly used means of adjusting for health status, the approach is not without limitations: a significant proportion of physician visits are for preventive care and are not the result of illness; bed days reflect only one dimension of the impact of illness and may be a poor indicator for long-term illnesses that are stable or in remission or for illnesses such as certain skin conditions that routinely result in no bed days.[4,7,17]

Finally, while the results presented are based on a large overall sample, sample counts are relatively small in certain morbidity-income cells. Estimates based on the smaller sample totals have higher relative standard errors. Hence, in interpreting results for individual morbidity categories the reader should pay close attention to standard error estimates presented in the tables.

Taken together, these limitations of the data and our analysis suggest that results for individual morbidity categories (e.g., the number of bed days for low income children with dermatologic conditions) should be viewed cautiously. Rather, the strength of this analysis lies in the consistency of results among the morbidity categories. Similar prevalence but more bed days on the part of low income children was

demonstrated in all but two of the morbidity categories. In almost all cases, children from low income families were reported to make fewer physician contacts on a bed day adjusted basis.

Independent of methodological issues, critics of the value of medical care will question whether improving access for low income children, as recommended here, will result in measurable improvements in health status. Both direct and indirect evidence from a variety of sources indicate the value of medical care in improving child health status.[18] In the long run, medical care should be viewed in the context of the special needs of impoverished children. Comprehensive policies that address the complex and interrelated social, emotional, behavioral, and physical requirements of impoverished children may be required in order to make most efficient use of resources.

Unfortunately, little is known about which factors contribute most to enhancing a child's health status, or how different "inputs," such as diet and exercise, interact to effect changes in health status. Thus, while a comprehensive set of policies toward improving the health of children appears sensible, the specifics of that policy do not emerge from our analyses. Further examination of data from the 1981 Child Health Supplement and planned analyses of the 1988 Child Health Supplement and the Third Health and Nutrition Examination Survey should help to provide some of the information needed for rational policy.

Although death rates in childhood are lower than those in adults, morbidity is neither infrequent nor without impact on function. Moreover, certain groups within the child population, notably those from low income families, are at high risk of substantial levels of morbidity. If for no other reason than protecting society's investment in the subsequent generation of adults, more sustained commitment to documenting and monitoring child health is warranted.

APPENDIX A
Child Health Supplement Morbidity Categories

Group 1: Acute Self-Limited (conditions present three months or less)
Hepatitis
Other liver trouble
Other bowel trouble
Digestive system disease
Pneumonia
Other lung, pulmonary or respiratory condition
Skin allergy
Other genitourinary conditions
Other skin trouble
Meningitis
Nephritis
Urinary infection
Other kidney trouble
Other thyroid trouble
Other heart trouble
Group 2: Allergies
Allergy, respiratory
Hay fever
Allergy, other and multiple
Eczema
Group 3: Asthma
Asthma
Group 4: Repeated Ear Infections
Repeated ear infections
Group 5: Tonsillitis
Tonsillitis, enlarged adenoids and/or tonsils
Group 6: Acute, Likely to Recur (conditions present more than three months)
Hepatitis
Pneumonia
Skin allergy
Meningitis
Nephritis
Urinary infection
Group 7: Chronic Medical
Other liver trouble*
Colitis
Other bowel trouble*
Hernia or rupture
Digestive system disease*
Allergy, digestive
Tuberculosis
Other lung, pulmonary or respiratory condition*
Arthritis
Rheumatism
Ulcer, other
Other genitourinary conditions*
Other skin trouble*
Epilepsy
Convulsions (repeated)
Seizures (repeated)
Blackouts (repeated)
Migraine
Chorea

St. Vitus' dance
Other kidney trouble*
Diabetes
Goiter trouble
Other thyroid trouble
Cystic fibrosis
Sickle cell anemia
Rheumatic fever
Rheumatic heart disease
Congenital heart disease
High blood pressure
Other heart trouble*
Cancer (any kind)

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*If present more than three months.

Group 8: Chronic Specialty
Curvature of spine
Trouble with flatfeet
Clubfoot
Tendon, muscle or cartilage disease
Other ear trouble
Bone disease
Deafness
Trouble hearing/one ear
Trouble hearing/both ears
Other hearing trouble
Blindness
Cataracts
Trouble seeing/one eye
Trouble seeing/both eyes
Other trouble seeing
Cleft palate
Harelip
Stammering and stuttering
Other eye trouble
Other speech defect
Autistic
Cerebral palsy
Other palsy
Paralysis
Mental retardation
Missing finger
Missing hand
Missing arm
Missing toe
Missing foot
Missing leg
Permanent stiffness in back
Permanent stiffness in foot
Permanent stiffness in leg
Permanent stiffness in fingers

Permanent stiffness in hand
Permanent stiffness in arm
Other stiffness
Deformed back
Deformed foot
Deformed leg
Deformed fingers
Deformed hand
Deformed arm
Other deformities

Group 9: Dermatologic
   Psoriasis
   Trouble with acne
Group 10: Symptoms/Signs/Other
   Yellow jaundice
   Ulcer of skin
   Skin rash
   Headaches
   Anemia
   Heart murmur
   Other, nec

APPENDIX B
Sample Sizes for Morbidity Categories

Morbidity Category	All* Incomes	Low Income	Moderate Income	High Income
1. Acute Self-Limited	621	140	265	179
2. Allergies	1977	252	762	854
3. Asthma	473	121	177	143
4. Repeated Ear Infections	1268	247	510	422
5. Tonsillitis	870	179	323	303
6. Acute, Likely to Recur	549	106	219	185
7. Chronic Medical	1108	234	430	375
8. Chronic Specialty	1452	289	579	509
9. Dermatologic	490	51	169	240
10. Symptoms/Signs/Other	1311	277	512	445

NOTES: *Includes 1,209 with income not reported
SOURCE: Microdata from the 1981 National Health Interview Survey, Child Health Supplement

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