

# Estimating the Risk of Food Stamp Use and Impoverishment During Childhood

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**Objective:** To estimate the lifetime risk that an American child will reside in a household receiving food stamps and, as a result, will encounter poverty and a heightened exposure to food insecurity.

**Design:** Thirty years of longitudinal data from the Panel Study of Income Dynamics survey data set.

**Setting:** Nationally representative sample of the US population.

**Participants:** Approximately 90 000 childhood years of information are pooled together to create a series of life tables that span the ages of 1 to 20 years.

**Main Outcome Measure:** Self-reporting measure of whether survey households received the Food Stamp Program during the prior year.

**Results:** Between the ages of 1 to 20 years, nearly half (49.2%) of all American children will, at some point, reside in a household that receives food stamps. Households in need of the program use it for relatively short periods but are also likely to return to the program at several points during the childhood years. Race, parental education, and head of household's marital status exert a strong influence on the proportion of children residing in a food stamp household.

**Conclusions:** American children are at a high risk of encountering a spell during which their families are in poverty and food insecure as indicated through their use of food stamps. Such events have the potential to seriously jeopardize a child's overall health.

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**R** ESEARCH HAS REPEATEDLY demonstrated that 2 of the most detrimental economic conditions affecting a child's health are poverty and food insecurity. Children in poverty are significantly more likely to experience a range of health problems, including low birth weight, lead poisoning, asthma, mental health disorders, delayed immunization, dental problems, and accidental death.<sup>1-3</sup> Poverty during childhood is also associated with a host of health, economic, and social problems later in life. These include a greater likelihood of impaired physical and mental growth, lower academic achievement, and a greater propensity toward poverty as an adult.<sup>4,5</sup> Likewise, food insecurity during the childhood years is associated with health and nutrition complications, such as iron deficiency, undernutrition, and a lack of dietary balance.<sup>6-8</sup>

Understanding the degree to which American children are exposed to the risks

of poverty and food insecurity across the length of childhood would appear to be an essential component of pediatric knowledge, particularly in light of the growing emphasis on the importance of community pediatrics.<sup>9-11</sup> The presence of poverty and food insecurity seriously jeopardizes American children's overall health, and understanding the likelihood and patterns of these risks across the span of childhood is a critical step toward alleviating these conditions.

*For editorial comment  
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A particularly appropriate marker of both poverty and food insecurity is that of food stamp use. The Food Stamp Program represents the nation's largest safety net program addressing hunger and malnutrition.<sup>12</sup> During the past 30 years, participation rates have averaged between 7% and 10% of the total US

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population in any given month, with children representing half of all food stamp participants.<sup>13,14</sup> Nevertheless, only approximately 60% of those who are eligible for the program actually participate in and receive food stamp benefits.<sup>15,16</sup> Consequently, it could be argued that the number of food stamp recipients represents an undercount of the total number of households in need of food assistance.

The program itself provides monthly assistance for eligible recipients to purchase food items at authorized grocery stores. By definition, families receiving food stamps must be below 130% of the official poverty line, their gross income must fall below 100% of the poverty line, and their assets must consist of no more than \$2000.<sup>17</sup> As a result, food stamp receipt constitutes a more comprehensive marker of poverty than the official poverty line in that it takes into account not only low levels of income, but also a lack of assets in determining eligibility for the program. Households receiving food stamps are therefore both income and asset poor.

Food stamp use is also highly correlated with food insecurity; research indicates that 53% of all food stamp households are food insecure, compared with 11% of the general population.<sup>18</sup> As Nord et al state, although

the relationship between food security and the use of food and nutrition assistance programs is complex . . . it is the more food-insecure households, those having greater difficulty meeting their food needs, that seek assistance from the programs.<sup>18(p31)</sup>

As a result, the majority of families who turn to the Food Stamp Program for food assistance have been, or will be, food insecure.

The objective of this study was to estimate the proportion of American children who at some point during their childhood will reside in a household that receives food stamps and, consequently, experience both impoverishment and a substantial likelihood of food insecurity. This research is unique in that it is the first empirical study, to our knowledge, to derive cumulative estimates of such economic hardship across the entire course of childhood. The magnitude of this cumulative risk represents a potentially negative threat to the overall well-being of children's health in America. In addition, the length and patterns of food stamp use are examined as well as how the use of food stamps varies with respect to a child's race and head of household's education and marital status.

## METHODS

### DATA SET

The analysis in this article is based on longitudinal data derived from the Panel Study of Income Dynamics (PSID). The PSID is a nationally representative, longitudinal sample of households interviewed annually from 1968 through 1997 (after 1997, the PSID has been conducted on a biennial basis). It constitutes the longest-running panel data set in the United States.<sup>19</sup> The PSID was specifically designed to follow income dynamics over time. In addition, it tracks yearly household participation in an array of welfare programs, including the Food Stamp Program.

The PSID initially interviewed approximately 4800 US households in 1968, collecting detailed information on

roughly 18 000 individuals. The PSID has followed up these individuals annually (biennially after 1997), including children and adults who left their original households to form new households (for example, children leaving home, separations, divorce). Thus, the PSID is designed so that in any given year the sample is representative of the entire nonimmigrant US population. The PSID interviews a primary adult in each household to obtain information about each member of the family. The original response rate in 1968 was 76%. Since 1969, the response rates for subsequent waves have ranged between 96.9% and 98.5%.<sup>20</sup>

Throughout the analysis, the sampling weights were used to ensure that the PSID sample accurately reflected the US population. Specifically, we used the weights assigned to individuals for each given wave to take advantage of the PSID practice of periodically adjusting the weights to account for nonresponse bias.<sup>21</sup>

Information on both the household and individual level were taken from the initial wave of 1968 through 1997. As noted earlier, after 1997, the PSID began interviewing households every other year. Consequently, for the purposes of using annual data to construct our life tables, we restricted the analysis to the waves of 1968 through 1997. This represents 30 years of longitudinal information that translates into roughly 90 000 childhood years embedded in the analysis for this article.

### LIFE TABLE TECHNIQUE

Household and demographic information on children throughout this 30-year period were used to construct a series of life tables that estimate the risk of food stamp use across the entire length of childhood (ages 1-20 years). The life table is a technique that demographers and medical researchers often use. Although primarily found in mortality analyses, it can be applied to other areas of research as well.<sup>22,23</sup> The life table examines the extent to which specific events occur across intervals. The intervals comprise each year an individual ages. During that year, one can calculate the probability of an event occurring (in this case, food stamp use) for those who have yet to experience the event. If the event fails to occur, the individual is then allowed to enter the next year of the life table. Once food stamp use has occurred (or various lengths of food stamp use), the individual is no longer at risk and therefore exits the life table. Based on these age-specific probabilities, the cumulative proportions of an event occurring across the life table can be calculated. These cumulative proportions represent the core of our analysis and are presented throughout the "Results" section.

Children may contribute anywhere from 1 to 20 person-years within the life table (person-years and age of child are identical). All children enter the life table at age 1 year (rather than age 0 year because it is only at age 1 year that a full year of data are obtained within the PSID) and are followed up accordingly until they either experience the event or age out of the analysis. For example, a child within the PSID who was 1 year of age in 1990 and then in 1994 experienced a year in which food stamps were used would have contributed 5 person-years within our analysis. In this case, he or she would be included in the age-specific estimates for ages 1, 2, 3, 4, and 5 years.

One of the consequences of this approach is that period effects are smoothed out both within and across the age intervals. For example, some of the approximately 10 000 children who are contained in our 5-year-old group experienced their fifth year in 1975; some, in 1985; and some, in 1995. One of the results of this is that historical effects, such as recessions, will not unduly affect any particular age group or our hypothetical cohort as a whole.

**Table 1. Cumulative Proportions of Children Experiencing Various Years of Household Food Stamp Receipt**

Age, y	Years of Food Stamp Receipt				
	≥1 y	≥2 y	≥3 y	≥4 y	≥5 y
<b>Total Years Experienced</b>					
1	0.1209				
5	0.2608	0.1728	0.1292	0.0909	0.0449
10	0.3593	0.2518	0.2213	0.1885	0.1609
15	0.4358	0.2948	0.2596	0.2325	0.2036
20	0.4918	0.3261	0.2810	0.2636	0.2278
Total <sup>a</sup>	89 121	84 212	83 142	82 404	81 798
<b>Consecutive Years Experienced</b>					
1	0.1209				
5	0.2608	0.1409	0.0845	0.0651	0.0449
10	0.3593	0.2044	0.1418	0.1141	0.0839
15	0.4358	0.2352	0.1726	0.1392	0.1058
20	0.4918	0.2574	0.1899	0.1540	0.1151
Total <sup>a</sup>	89 121	99 405	108 301	110 061	119 558

<sup>a</sup>Total number of person-years used to construct the column.

**Table 2. Cumulative Proportions of Children Experiencing Household Food Stamp Receipt by Race, Household Head's Education, and Household Head's Marital Status**

Age, y	Race		Education		Marital Status	
	White	Black	≥12 y	<12 y	Married	Not Married
1	0.0801	0.3307	0.0799	0.1557	0.0794	0.4254
5	0.1879	0.6189	0.1738	0.3313	0.1799	0.7114
10	0.2642	0.7697	0.2290	0.4589	0.2601	0.8265
15	0.3268	0.8528	0.2730	0.5544	0.3246	0.8839
20	0.3729	0.8986	0.3092	0.6200	0.3696	0.9124
Total <sup>a</sup>	57 902	22 741	71 036	18 317	59 087	29 108

<sup>a</sup>Total number of person-years used to construct the column.

## MEASUREMENT

Food stamp use was derived from a series of questions asked by the PSID interviewers as to whether the household had received specific cash or in-kind public assistance programs at some point during the prior year. With regard to food stamps, respondents were asked, "Did you (or anyone else in your family) use government food stamps at any time in [prior year]?"

A household's use of food stamps during any given year may have consisted of varying months in which they actually received food stamps. For some, that time may have constituted the entire year, whereas for others, it may represent only 1 or 2 months. In both cases, however, the individuals within those households were counted as receiving food stamps during the calendar year. Data regarding means-tested program participation within the PSID have been shown to be quite accurate (reflecting positively on the ability of respondents to recall accurately information regarding welfare receipt for the prior year).<sup>24</sup>

Three key characteristics influencing children's use of food stamps were examined in this analysis: the child's race, head of household's education, and head of household's marital status. Race was dichotomized into black or white. The sample size did not allow us to examine other racial or ethnic groups, such as Latino, within the life table analysis. However, these groups were included in the analysis for the total population as well as the separate analysis for education and marital status. Education was dichotomized into head of household having less than 12 years of education vs 12 or more years of edu-

cation. Marital status was divided into married couple households vs nonmarried couple households.

## RESULTS

In **Tables 1, 2, and 3**, the column for age represents children who reached various chronological points of childhood, while the proportions displayed across the rows for each of these ages refer to the cumulative proportion of such children who were in a household receiving food stamps by that particular age. In Table 1, the 5 columns to the right of the Age column refer to various years of food stamp receipt, beginning with children who experienced 1 or more years of receiving food stamps and continuing across the Table through children experiencing 5 or more years of food stamp receipt. Consequently, these columns are not mutually exclusive; some of the children falling into the 1 year or more of food stamp receipt will by definition also be included in the later columns as well.

## OVERALL PATTERNS

The first column (≥1 year) in Table 1 represents the proportion of children who at some point during their childhood resided in a household that participated in the Food

Stamp Program. The cumulative percentages were 12.1% at age 1 year; 26.1% by age 5 years; 35.9% by age 10 years; 43.6% by age 15 years; and 49.2% by age 20 years. Consequently, approximately half of all American children will have been in a household that receives food stamps by the time they reach the age of 20 years.

The top panel of Table 1 estimates the likelihood of children experiencing 1 or more, 2 or more, 3 or more, 4 or more, or 5 or more total years of food stamp receipt across the childhood years. Table 1 shows that while nearly half of all children were in a household that received food stamps in at least 1 year, approximately one-third of children were in households that received food stamps in 2 or more years, 28.1% were in households that received food stamps in 3 or more years; 26.4%, in 4 or more years; and 22.8%, in 5 or more years. Based on these percentages, it can be further determined that if one looks only at those children who were in households that received food stamps, two-thirds of such children will experience food stamp receipt for at least 1 additional year, while nearly half (46.3%) will do so in 5 or more additional years by the time they reach the end of their childhood years.

The bottom panel of Table 1 estimates the proportion of children who are in households that received food stamps for various consecutive numbers of years. For example, if a child's household received food stamps when they were 6, 7, and 8 years of age, at age 7 years they would be counted as having received food stamps in 2 or more consecutive years, and at age 8 years, they would be counted as receiving food stamps in 3 or more consecutive years. Table 1 indicates that by age 20 years, one-quarter of children resided in households that received food stamps in 2 or more consecutive years; 19.0%, in 3 or more consecutive years; 15.4%, in 4 or more consecutive years; and 11.5%, in 5 or more consecutive years. From these data, it can be further estimated that for those children who received food stamps at some point between the ages of 1 and 20 years, only 20.3% of such children will be in a household receiving the program for 5 or more consecutive years.

Table 1 thus indicates that while the life course probability of food stamp use for children is quite high, the pattern of use tends to be of fairly short durations. This is reflected in the fact that although half of all American children will at some point reside in a household that receives food stamps, only 19% of American children will reside in a household that uses food stamps in 3 or more consecutive years.

### IMPACT OF DEMOGRAPHIC CHARACTERISTICS

Table 2 and Table 3 examine the impact that race, education, and marital status have on the cumulative proportion of children receiving food stamps during childhood. The columns for race, education, and marital status in both Table 2 and Table 3 are mutually exclusive. Table 2 examines the bivariate pattern of these characteristics, while Table 3 provides a multivariate analysis.

Table 2 indicates that each of these 3 characteristics exerts a strong influence during the childhood years in affecting the likelihood of food stamp use. Being black, having a head of household with less than 12 years of

**Table 3. Cumulative Proportions of Children Experiencing Household Food Stamp Receipt by Various Combinations of Demographic Characteristics<sup>a</sup>**

Age, y	White		Black	
	≥12 y	<12 y	≥12 y	<12 y
<b>Married Household</b>				
1	0.0460	0.0783	0.1022	0.1670
5	0.1154	0.1957	0.2691	0.4227
10	0.1542	0.2841	0.3655	0.5979
15	0.1861	0.3563	0.4404	0.7143
20	0.2101	0.4013	0.4986	0.7804
<b>Nonmarried Household</b>				
1	0.2483	0.3678	0.4382	0.5787
5	0.4458	0.6309	0.7458	0.8900
10	0.5351	0.7641	0.8518	0.9701
15	0.5957	0.8385	0.9051	0.9906
20	0.6393	0.8771	0.9370	0.9963

<sup>a</sup>The total number of person-years used to construct this Table was 80 630.

education, and residing in a nonmarried household all result in substantially higher cumulative proportions of using the Food Stamp Program during childhood. Thus, 89.9% of black children will be in a household receiving food stamps by the time they reach age 20 years (compared with 37.3% for white children), 62.0% of children in households where the head has less than 12 years of education will have received food stamps (compared with 30.9% for children in households where the head has 12 or more years of education), and 91.2% of children who have been in nonmarried households during the entire length of their childhood will have participated in the Food Stamp Program (compared with 37.0% for children who have been in a married household). Consequently, although the risk of using food stamps for children with more advantageous characteristics is sizeable, that risk is dwarfed by the proportion of children with less advantageous characteristics who receive food stamps.

To simultaneously assess the impact of race, education, and marital status on the risk of using food stamps, a multivariate life table was built. For each age, a series of logit coefficients were calculated, which were then transformed into life table age-specific probabilities and cumulative proportions. This technique allowed us to track the childhood risk of food stamp use for children with various combinations of the earlier-mentioned characteristics.

Table 3 illustrates the profound impact that race, education, and marital status have in combination on influencing the cumulative proportions of children residing in a food stamp household during childhood. Children who are white and whose head of household is married and has 12 or more years of education have a cumulative percentage of residing in a food stamp household of 21.0% by age 20 years. On the other hand, by the age of 10 years, virtually all (97.0%) black children in nonmarried households whose head of household has less than 12 years of education will have received food stamps.

The first recommendation found in the 2005 American Academy of Pediatrics policy statement regarding the pediatrician's role in community pediatrics is that

Pediatricians should use community data (epidemiologic, demographic, and economic) to increase their understanding of the health and social risks on child outcomes and of the opportunities for successful collaboration with other child advocates.<sup>9(p1093)</sup>

Understanding and recognizing the economic risk that American children face across their life course would appear central to this recommendation.

This study has demonstrated that approximately half of all children at some point during their childhood will reside in a household that receives food stamps. In addition, nearly one-quarter of American children will be in households that use food stamps for 5 or more years throughout their childhood. Such children are by definition experiencing poverty and are also quite likely to encounter food insecurity as well.<sup>25</sup> Indicative of this is the fact that the average weekly food expenditure among food stamp households is only 87% of the cost of the US Department of Agriculture Thrifty Food Plan (the most conservative of the 4 food plans that the US Department of Agriculture constructs to estimate the cost of purchasing an adequate diet).<sup>18</sup> The consequence is that children in such households frequently face dietary and nutritional problems, along with a variety of challenges and stressors that accompany poverty.<sup>26</sup>

The magnitude of the findings reported in this article is consistent with a growing body of life course research on poverty and welfare use. This work has demonstrated that between the ages of 20 and 65 years, two-thirds of American adults will use a means-tested welfare program,<sup>27</sup> while slightly more than half will use the Food Stamp Program specifically.<sup>28</sup> In addition, between the ages of 1 and 17 years, more than 40% of children will encounter poverty or near poverty.<sup>29,30</sup>

The empirical results in this article are also consistent with a wider body of research demonstrating that American children face various economic risks and turmoils throughout their childhood years.<sup>31</sup> For example, American children as a whole experience the highest levels of poverty and social deprivation among the Western developed nations.<sup>32-34</sup> Likewise, the social safety net for US children is among the weakest within the industrialized world.<sup>35</sup> Furthermore, half of all American children will at some point during their childhood be raised for a period in a single-parent family.<sup>36</sup> All of these factors increase the economic stress, poverty, and food insecurity faced by children and their families.

Pediatricians routinely encounter the fallout from these conditions within their clinical and practice settings, including the stunting of growth, undernutrition, chronic asthma, and lead poisoning.<sup>1,37</sup> Furthermore, research has demonstrated that the psychological costs of childhood poverty are high, including damaging effects on cognitive functioning and social-emotional growth.<sup>38</sup> Research has also indicated that even limited exposure to poverty can have detrimental effects on a child's overall

quality of health.<sup>39,40</sup> Taken as a whole, the negative impact of poverty on children's overall health status is reflected in the fact that it has been estimated that poverty among American children raises the direct expenditures on health care by approximately \$22 billion per year.<sup>41</sup>

Although the analysis in this article is based on the longest-running and most comprehensive US longitudinal data set tracking patterns of income and welfare use, several methodological limitations should be noted with respect to this study. First, as previously mentioned, the sample size did not allow for analyzing racial comparisons beyond those of white and black. Second, although the PSID is representative of the US population, it is not representative of the immigrant population. Consequently, the results in this article are only applicable to the nonimmigrant US population. Finally, the measurement of food stamp use is less detailed than it ideally might be since it only takes into account whether a household received the program at some point during the year rather than the number of months that it received the program.

## CONCLUSIONS

The results in this article indicate that half of all American children will at some point during their childhood reside in a household that turns to the Food Stamp Program for financial and dietary help. Such households are by definition in poverty and are also quite likely to be experiencing food insecurity as well. Life table analyses demonstrate that households in need of food stamps use them for relatively short periods but are likely to return to the program at several points during the childhood years. For children who are in nonmarried households, who are black, or whose head of household has not graduated from high school, the odds of encountering spells of food stamp use are exceedingly high. Taken as a whole, children in the United States are at a substantial risk of experiencing poverty and food insecurity during their formative years. These conditions constitute a serious threat to the overall health and well-being of American children and, as such, represent a significant challenge to pediatricians in their daily practice.

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