

# Childhood Adversity and Later Mortality in an Urban African American Cohort

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The Woodlawn Project<sup>1</sup> is a longitudinal study of the development of psychological well-being and social adaptation in an epidemiologically defined cohort of African American first graders interviewed as adolescents and again as adults. The identification of childhood factors predictive of mortality has clear public health importance. Family and childhood adversity and psychosocial factors have been shown to have long-term effects on later mental health and school achievement in adolescence and young adulthood.<sup>2–7</sup> However, possible effects of such factors on longevity have been “mostly unstudied.”<sup>8</sup> In this article, we examine family and childhood factors in relation to the risk of later mortality.

## METHODS

Woodlawn is a poor, ethnically homogenous community on Chicago's South Side. At the study's inception (1966–1967), the entire population of children beginning first grade (aged 6–7y) in 9 public and 3 parochial elementary schools was entered in the study and assessed.<sup>1</sup> Data were obtained from the children's teachers and mothers when the children were 6 years old and from study participants themselves at ages 16–17 years<sup>9</sup> and 32–34 years.<sup>2</sup>

## Mortality

Information on death was obtained from family members and neighbors. We submitted these names and the names of all those we could not locate to the National Death Index (NDI); the 1979–1993 records were searched (NDI records begin with 1979). For positive matches we then obtained death certificates from the state, noting cause of death.

## Family and Childhood Adversity

Family and childhood adversity was assessed by family type, frequency of residential moves (0–2 or  $\geq 3$ ), living in a welfare family (yes or no), and frequency of corporal punishment as a child (infrequent, measured as never to once a week, or frequent, measured as a few times a week or almost every day). Four family types were defined by the adults who were present in the household.<sup>10</sup> In these analyses we examined the 4 types: mother and second adult (including fathers, grandmothers, etc.), mother alone, mother absent with a family member as caregiver, and foster family.

## Children's Behavior and Psychological Symptoms

First-grade teachers rated the children's behavior on scales indicating aggressive and shy behavior. A 4-point measure ranging from shy to aggressive was used: neither shy nor aggressive; shy only; aggressive only; and both shy and aggressive.<sup>10,11</sup> Psychological symptoms were measured by the 38-item Mother's Symptom Inventory (MSI), adapted from an instrument developed by Connors.<sup>7,12</sup> The continuous measure of the MSI was used.

## RESULTS

Distribution of the sample by individual and family characteristics is shown in Table 1. Of the 1242 first graders, 1040 were located for adult follow-up. Of the 202 not located, 51 were known to be alive; the status of the remaining 151 was unknown. Of the 1091 cohort members whose status was known at follow-up, 44 had died by the time of the adult assessment. These deaths translate to a minimum 26-year mortality rate of 3.5% (95% CI=2.6, 5.0), based on the original cohort of 1242. Most deaths occurred between the adolescent and adult assessments (35 of the 40 for whom year of death was known); 5 deaths occurred before adolescence. Among the 44 deaths, homicide was the most frequent identifiable cause of death (10, or 23%). The numbers and percentages of the other causes of death were 4 (9%) suicide, 3 (7%) AIDS-related illnesses, 3 (7%) drug overdose, 5 (11%) accidents, and 10 (23%) various diseases such as cardiac arrest and

**TABLE 1—Population Characteristics in a Prospective Study of Childhood Adversity and Mortality Among 1242 African Americans**

Characteristic	No. (%)
Gender	
Female	636 (51.2)
Male	606 (48.8)
Family type	
Mother and second adult	699 (56.3)
Mother alone	459 (37.0)
Mother absent (family member as caregiver)	61 (4.9)
Foster	23 (1.9)
Frequency of residential moves before 1966	
0–2	730 (58.9)
$\geq 3$	510 (41.1)
Receipt of welfare in 1966	
No	844 (68.0)
Yes	398 (32.0)
Corporal punishment in 1966	
Infrequent (never to once a week)	745 (60.1)
Frequent (a few times a week or almost every day)	495 (39.9)
Shy and aggressive behavior (teacher's report)	
Neither	646 (52.2)
Shy only	202 (16.3)
Aggressive only	211 (17.0)
Both shy and aggressive	179 (14.5)
Ratings by child's mother on Mother's Symptom Inventory <sup>a, b</sup>	

<sup>a</sup> A 38-item mental health inventory adapted from an instrument developed by Connors.<sup>7,12</sup>

<sup>b</sup> Mean  $\pm$  SD (range) = 9.86  $\pm$  7.52 (0–95).

sickle cell disease. For the 9 (20%) remaining there was no information.

For the 151 members whose mortality status was unknown, we considered 2 situations: First all original participants were treated as alive, providing an outcome classification with 100% specificity (assuming correct NDI matching); a total of 1242 cases were used for the analysis. Second, those with unknown status were deleted; 1091 cases were used. These 2 sets of analyses were compared to ensure that any association between early

**TABLE 2—Predictors of Mortality Among 1091 Participants in a Prospective Study: Childhood Individual and Family Characteristics**

Characteristic	Adjusted Odds Ratio	95% Confidence Interval
<b>Gender</b>		
Female <sup>a</sup>	1.00	
Male	2.62	1.31, 5.24**
<b>Childhood adversity</b>		
Family type		
Mother and second adult <sup>a</sup>	1.00	
Mother alone	1.82	0.93, 3.59*
Mother absent (family member caregiver)	0.78	0.10, 6.16
Foster	16.87	5.10, 55.78**
Frequency of residential moves before 1966		
0–2 <sup>a</sup>	1.00	
≥ 3	1.62	0.84, 3.13
Corporal punishment in 1966		
Infrequent (never to once a week) <sup>a</sup>	1.00	
Frequent (a few times a week or almost every day)	1.12	0.60, 2.12
Childhood behavior and mental health		
Shy/aggressive behavior (teacher's report)		
Neither <sup>a</sup>	1.00	
Shy only	0.81	0.32, 2.04
Aggressive only	1.25	0.43, 3.60
Both shy and aggressive	1.44	0.54, 3.82
Ratings by child's mother on Mother's Symptom Inventory	1.02	0.98, 1.06

<sup>a</sup>Reference category.

<sup>b</sup>A 38-item mental health inventory adapted from an instrument developed by Connors.<sup>7,12</sup>

\* $P < .10$ ; \*\* $P < .05$

characteristics and subsequent mortality would be conservative.<sup>13</sup>

**Childhood Predictors of Later Mortality.** Risks of mortality for 1091 participants, as indicated by multivariate logistic regression analyses, are shown in Table 2. After adjusting for other variables, being in foster care (odds ratio = 16.87) and being in a single-mother family (OR=1.82,  $P < .10$ ) were significantly associated with mortality. Males had a higher risk of mortality than females (OR=2.62). In the analyses that included all participants of unknown status as alive (n=1242), the estimates of odds ratios were similar (results not shown).

## DISCUSSION

Of the Woodlawn Project's original 1242 cohort members, 44 (3.5%) died by 32 years of age; 39% of deaths were directly at-

tributable to a homicide, suicide, or drug overdose. These reasons for mortality are also in accord with other studies of urban populations, which show homicide to be a major cause of death for youth: Black youths are killed (61.5 deaths per 100 000) at a level far outstripping that of their White counterparts (11.1 per 100 000).<sup>14–16</sup>

These analyses highlight the considerable risk of early death (aged 32y or younger) to persons who have been in foster care. Although the number of children in foster care was small in absolute terms (23, or 1.9%) the odds of dying for this subgroup were greater by a factor of 16. Although the odds ratio for having been raised in a single-mother home was not as high and was only marginally significant, about half of the deaths in this cohort (n=22) occurred among participants who had been raised in single-mother homes. Therefore,

the relative risk for this subgroup is higher than for any other.

These findings raise the question whether foster care is responsible for or plays a causal role in those deaths or whether being in foster care reflects adverse situations in the family of origin. Probably both factors play a part. Although the number of foster families was too small for further subanalyses, a few observations of these families indicated difficulties. First, for children living in foster care in first grade, none of the biological mothers was reported as deceased. Therefore the reason for foster placement was something other than the death of the mother. Second, children were frequently switched from one foster family to another. This instability in placement may leave a child very vulnerable to developmental difficulties and less likely to form stable family bonds.

Studies of the protective and risk factors are difficult, given the need for longitudinal-perspective studies and the relatively small number of foster children present in any 1 community. Our study's results are based on relatively small numbers, and we cannot adequately study the reasons for mortality. Larger-scale studies at the state and national levels are needed. Further research is critical, because foster children represent a subgroup that is easily identifiable, and policies for foster care could be designed that might decrease the risk. ■

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## Contributors

All three authors helped formulate the hypotheses and participated in writing the article. H-S. Juon conducted the analyses and wrote first drafts of the results and discussion. M.E. Ensminger planned the overall study and helped write the article. M. Feehan helped conceptualize the overall study questions.

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### Human Participant Protection

This work was approved by the Committee on human research of Johns Hopkins Bloomberg School of Public Health. All adolescent and adults participants consented to be interviewed. In 1966–1967 when the data were initially collected, there were no formal guidelines for the collection of survey data from study participants.

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