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## Adversity and children experiencing family homelessness: Implications for health

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### Abstract

This study tests links between adversity and health problems among children in family emergency housing. Children who experience family homelessness are at risk to also experience high levels of stress, health problems, and need for pediatric care. Understanding the connection between stress and health holds the potential to reduce persistent health disparities. Analyses tested whether experiencing a greater number of stressful life events during the early years of life was related to worse health conditions, emergency health care utilization, and hospitalizations. Parents noted children's experience of negative stressful life events, health problems, emergency room (ER) use, and hospitalization. Two cohorts of kindergarten-aged children staying in emergency family housing participated in the study in 2006–07 ( $n = 104$ ) and in 2008–09 ( $n = 138$ ), with the results examined separately. In both cohorts, more health problems were acknowledged for children exposed to more negative stressful life events. Stressful life events were not related to ER use but did relate to hospitalization for the 2006–07 cohort. Results affirm links between stress in early childhood and health problems among children living in emergency housing. Findings are consistent with the hypothesis that adversity in early childhood contributes to income and racial disparities in health.

### Keywords

homeless children; life stress; health status disparities; health care disparities

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Children experiencing homelessness are a widespread group who encounter high rates of psychosocial adversity and face risk for poor health and developmental problems. In the United States, an estimated 517,416 children stayed in emergency housing for families during 2014 (U.S. Department of Housing and Urban Development 2015).

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Disproportionately, these children are young (under six years old), belong to racial minority groups, and have low-income backgrounds. Many children in shelter have experienced stressful life events, including stressors directly related to residential instability (e.g., the loss of housing, community, and relationships) as well as other stressors like witnessing domestic and community violence (Cutuli and Herbers 2014; Gewirtz, Hart-Shegos, and Medhanie 2008; Herbers, Cutuli, Monn, Narayan, and Masten 2014; Rog and Buckner 2007; Weinreb, Goldberg, Bassuk, and Perloff 1998). Differences in past stressful experiences outside the presence of protective influences have been linked to individual differences in physical health, mental health, and a breadth of developmental outcomes (Felitti et al. 1998; Masten et al. 2014; Masten, Miliotis, Graham-Bermann, Ramirez, and Neemann 1993; Sroufe, Egeland, Carlson, and Collins 2005), as well as to disruptions in physiological homeostatic processes, particularly the physiological stress response (Cutuli, Wiik, Herbers, Gunnar, and Masten 2010; Gunnar and Quevedo 2007; Gunnar and Vazquez 2006). As a group, children who experience homelessness and residential instability have higher rates of problems in age-salient developmental tasks, such as worse academic achievement and more behavioral health problems, than do their non-homeless peers (Buckner 2008; Cutuli et al. 2013; Obradovi et al. 2009). For that reason, homelessness is considered a context of stress and adversity that places children at the high end on a continuum of poverty-related risk (Buckner 2008; Cutuli and Herbers 2014; Masten et al. 1993).

Persistent health disparities exist for low-income and racial minority groups in general (Flores and The Committee on Pediatric Research 2010; Nelson 2002) and for homeless children, among whom poverty and racial minority groups are overrepresented (Buckner 2008). Past research consistently has documented high rates of disease among children in emergency housing. For example, parents living in emergency shelter in New York City noted two to three times the national rate of childhood asthma (Grant, Bowen, et al. 2007; McLean et al. 2004), a result that has been reported previously with respect to the samples involved in the current study (Cutuli et al. 2010, 2014). Other work has documented increased rates of obesity (Wood, Valdez, Hayashi, and Shen 1990), chronic infections (Grant, Shapiro, et al. 2007), and other acute and chronic diseases for children in homeless families (Alperstein, Rappaport, and Flanagan 1988; Buckner 2008; Miller and Lin 1988; Weinreb et al. 1998). Meanwhile, families experiencing residential instability and homelessness are more likely to postpone medical care and visit the emergency room more frequently (Ma, Gee, and Kushel 2008).

The etiology of these health disparities likely involves multiple factors across different levels of the individual and context that over time contribute to childhood and adult health status. This idea has been emphasized recently in developmental and life-course perspectives on racial- and income-related health disparities (Geronimus 2001; Larson, Russ, Crall, and Halfon 2008; Lu and Halfon 2003; Shonkoff, Boyce, and McEwen 2009). Meanwhile, other work has highlighted the links between allostatic load or ‘toxic stress’ and the manifestation of childhood and adult health problems (Committee on Psychosocial Aspects of Child and Family Health et al. 2012; Shonkoff et al. 2012). Allostatic load and the related description of ‘toxic stress’ refers to intense, frequent, and/or prolonged activation of physiological stress-response systems without the assistance of adequate external regulation from an adult (e.g., a soothing parent) (National Scientific Council on the Developing Child 2005;

Shonkoff 2006). High levels of stress, particularly in early childhood, can have a lasting impact on developing physiological regulatory systems such as interfacing endocrine, immunological/inflammatory, and neurological functioning. In turn, these disruptions place the individual at risk for a myriad of health and mental health problems over the lifespan, such as atopic conditions like asthma or allergies, hypertension, chronic infections, and dysregulated stress responding and behaviors (Shonkoff et al. 2009). Parents who experience homelessness are more likely to have experienced high levels of adversity in their own lives and also create developmental contexts for their children that are higher in risk (Cutuli, Montgomery, Evans-Chase, and Culhane 2015). These disruptions also can have an intergenerational effect through their impact on mothers' health and behavior during pregnancy and on the early lives of her children (Geronimus 2001; Lu and Halfon 2003). Recent efforts in pediatrics, public health, and broader developmental science (Braveman and Barclay 2009; Committee on Psychosocial Aspects of Child and Family Health et al. 2012; Shonkoff et al. 2009; Shonkoff et al. 2012) outline plausible means through which adversity from the prenatal period through early life can 'get under the skin' and contribute to pathogenic processes in childhood and disease in adulthood.

Childhood risk and adversity have been linked to a range of health conditions in the general population (Felitti et al. 1998; Flaherty et al. 2009; Larson et al. 2008), and there is preliminary support for the theory of the stress-health link among children experiencing homelessness. Most early studies found that homeless children had generally poorer health and higher rates of symptoms and conditions than did their low-income, housed peers or the general population (Buckner 2008). These efforts did not measure stress or adversity directly but, rather, found higher rates of health problems for homeless children. Recognizing that homeless children report a range of exposure to stressful experiences, Herbers and colleagues (2008) directly tested for links between different levels of stressful life events and health among 8- to 11-year-old children in emergency housing during 1995. Children who had experienced a greater number of stressful life events also had more health problems, such as ear infections, headaches, and asthma.

The current study documents rates of stressful negative life events, health problems, emergency room use, and hospitalization among two cohorts of kindergarten-aged children staying in emergency housing with their families. Analyses test hypotheses that children who experience a greater number of stressful negative life events have more health problems, more emergency room utilization, and more hospitalization. The age range was chosen for three reasons: (a) to focus on stressful life events that occurred in early life as postulated by the prevailing developmental framework linking stress and health, (b) to better accommodate reliable reporting of past life events, which generally degrades for recall over periods longer than a few years (Caspi, Hariri, Holmes, Uher, and Moffitt 2010), and (c) to accommodate other studies of early school success (Masten et al. 2012). Data were analyzed separately for two cohorts: children in emergency housing for families during 2006–07 and those in it during 2008–09. Separate analyses allow for immediate constructive replication while accounting for slight differences in recruitment. Also, while not a central claim of the current study, the mortgage crisis greatly intensified in the United States during 2007, constituting a macroeconomic shift with the potential to alter the characteristics and experiences of the homeless population (Buckner 2008; Rog and Buckner 2007). Separate

analyses before and after the peak of this crisis can guard against any unmeasured shifts in the population and attest to the robustness of any found effects.

## Method

### Participants

For both cohorts, children and primary caregivers were recruited while staying in emergency housing for families. All data collection took place in shelters during late spring through early fall. Recruitment occurred after families had spent at least three nights in shelter to allow time to acclimate. Two families were excluded because children had developmental delays previously identified by a health-care provider, mental health-care provider, or educator that would interfere with aspects of the data collection. Eighteen families were excluded because primary caregivers or children were not fluent in English. Only one child participated per family, except for one pair of siblings in 2006–07. Children were not invited to participate in 2008–09 if they had participated in 2006–07. Primary caregivers provided informed consent, and all study procedures were approved and overseen by the University of Minnesota Institutional Review Board.

Demographic characteristics of both samples resemble the composition of the broader population of families and children this age in shelters in this city during the respective data-collection periods. Participants were predominantly from racial minority backgrounds. Detailed breakdowns of demographic characteristics and key variables are provided in Table 1.

For the first cohort, in 2006–07, 104 children ages four years to seven years, six months, along with their primary caregivers, participated while staying at one emergency housing shelter. The sample represents about 85% of all eligible families at this shelter during this first study period.

The second cohort, in 2008–09, involved 138 families, each with a child four years through six years, 11 months old entering kindergarten or first grade. Families were staying in any of the three general emergency housing shelters for families in the same city. The sample represents 72% of all eligible families during the second study period.

### Procedures

Relevant to the current analyses, parents in each family completed interviews that included measures of stressful life events experienced by the child, information about child health problems, and whether the child had ever been hospitalized or had visited the emergency room (ER) in the past year. Measures have previously shown acceptable reliability and validity (Cutuli et al. 2010).

**Health problems and service utilization**—Parents completed the MacArthur Health and Behavior Questionnaire (Essex et al. 2002), administered as an interview. This measure asks whether the child has ever had any of a list of 16 health problems (see Table 2). It also asks whether the child had visited the ER in the past year and whether the child had ever been hospitalized overnight.

**Negative lifetime events**—Lifetime event scores were sums of the number of acknowledged items on the Lifetime Life Events Questionnaire (Masten et al. 1993) completed by the primary caregiver. This questionnaire asks about individual stressful events that the child has experienced during his or her lifetime, including events and situations that threaten the child directly as well as those experienced by the child that threaten a parent, a family member, or the integrity of the family. One item, “Has your child been hospitalized,” was excluded from consideration because of likely overlap with health problems and utilization. Scores are based on a 15-item version of the measure in 2006–07 and an expanded, 21-item version in 2008–09 (see Table 3). These scores, respectively, previously have been linked to differences in the children’s physiological stress response (Cutuli et al. 2010; Cutuli 2011). Cumulative risk or adversity scores are commonly used in developmental science as indicators of the latent level of risk present in individual lives, even though (1) items from a single stressful episode might overlap for some children, (2) some items might constitute more or less stressful experiences than others, and/or (3) some stressful experiences might not be asked about explicitly on the measure. The cumulative adversity score approach as used in this study is well established in developmental science broadly (e.g., see Obradovic, Shaffer, and Masten 2012) and in other studies using the same measures as the current study (Cutuli 2011; Cutuli et al. 2015).

### Analytical approach and missing data

Hypotheses were tested using linear regression when predicting number of health problems and logistic regression for the dichotomous outcomes of hospitalization and ER use. All analyses controlled for child age and sex. Data from each cohort (2006–07; 2008–09) were analyzed separately.

A small amount of data was missing. In 2006–07 three children were missing data on whether they had been to the ER and one on whether he had been hospitalized. No families were missing health problem or negative lifetime event scores. No data were missing in 2008–09. Cases with missing data were excluded from analyses involving the missing data.

## Results

In 2006–07 caregivers reported an average of 0.75 health problems ( $SD = 1.04$ ) for their children, while 37% of children had used the ER in the past year and 23% had been hospitalized at least once in their lifetime. These rates were similar in 2008–09, with an average of 0.61 health problems ( $SD = 0.98$ ), 29% reporting ER use, and 23% reporting hospitalization. The same four health problems had the highest rates in both studies: asthma (28% in the 2006–07 cohort and 21% in the 2008–09 cohort—see also Cutuli et al. 2010, 2014); repeated, persistent respiratory infections (17% and 17%); repeated, persistent ear infections (13% and 7%); and bad allergies requiring doctor visits and frequent medications (8% and 7%). Six conditions asked about were not acknowledged: arthritis; cystic fibrosis; diabetes; HIV infection or AIDS; kidney disease; and leukemia or cancer. Rates for all acknowledged items are provided in Table 2.

Parents also acknowledged considerable rates of negative lifetime events for their children. On average, children in the 2006–07 sample experienced 2.91 events ( $SD = 2.13$ ; minimum

= 0; maximum = 9) on the 15-item form. Children in the 2008–09 study experienced an average of 2.80 events (SD = 2.24; minimum = 0; maximum = 11) on the 21-item form. Every item was acknowledged by at least one family. Rates of individual events are provided in Table 3.

Considering regressions, negative life events were related to the number of health problems in 2006–07 ( $\beta = 0.27$ ;  $p = .01$ ) and in 2008–2009 ( $\beta = 0.19$ ;  $p = .02$ ). In the 2006–07 cohort negative life events were positively related to having ever been hospitalized overnight, (Exp(B) = 1.34;  $p = .01$ ), but that was not true of the 2008–09 cohort (Exp(B) = 1.12;  $p = .20$ ). Negative life events were not related to ER use in the past year (2006–07 cohort: Exp(B) = 1.01;  $p = .95$ ; 2008–2009 cohort: Exp(B) = 1.02;  $p = .80$ ). See Table 4.

## Discussion

Homeless children who experienced more stressful negative life events had higher rates of health problems. This relation was present in two cohorts of children residing in family emergency housing during 2006–07 and 2008–09. Stressful life events were not related to ER use, while more life events increased the odds of having been hospitalized for the 2006–07 cohort. The results generally support integrative developmental frameworks that emphasize the effects of adversity on health (Committee on Psychosocial Aspects of Child and Family Health et al. 2012; Shonkoff et al. 2009; Shonkoff et al. 2012) and specifically affirm the stress-health relation among young homeless children. Appreciating the relation of stress and health holds the promise for more complete and integrated care among those who serve residentially unstable families (e.g., primary care physicians, ER providers). This has the potential to open new avenues for addressing multiple contributors to poor health by connecting with other services (case management, evidence-based mental health care) and supporting families (Committee on Psychosocial Aspects of Child and Family Health et al. 2012).

Childhood homelessness continues to represent a context of stress and adversity that places children at risk for poor health. Rates of asthma, respiratory infections, severe allergies, and ear infections were prevalent in both cohorts, much as with past reports (Buckner 2008). Considering asthma, for example, the observed rates for kindergarten-aged children in the current samples were 27.9% and 21.0%, which outstrip prevalence rates for all children nationally (10 to 14%; Bloom, Cohen, & Freeman 2010) and statewide (9.5%; Minnesota Department of Health 2008). Also consistently prevalent were the rates of stressors related to family functioning and exposure to violence (e.g., severe relationship problems between caregivers, divorce/separation, parent incarceration, witnessing violence). Health-care and other providers who serve homeless children should be aware of these rates of stressful life events and the multiple health problems documented here. Increased screening for symptoms of atopic disease and infection may assist in providing comprehensive care, as would education and attention to management of these more common conditions.

Contrary to expectations, negative life event scores did not relate to difference in past-year ER utilization, and it related to hospitalization only among the 2006–07 cohort. Generally, ER utilization in the preceding year was high for both cohorts, at 37% and 29%,

respectively, compared with a national average rate of 17.7% for all children (Bloom, Jones, and Freeman 2013). It appears that ER use is a relatively common occurrence for families with children in the current study, and while adversity did predict the number of health conditions, the high rate of ER utilization did not differ based on children's adversity histories. It may be that families who experience homelessness use the emergency room in ways that do not depend on the number of conditions present but, rather, on other factors, such as severity of disease, lack of access to medications and care to effectively control previously diagnosed conditions, and/or a general inability to access care for more routine needs (e.g., sick visits) because of residential mobility (Cutuli et al. 2010, 2014; Cutuli and Herbers 2014). While a similar set of speculations could be applied to the inconsistent findings about hospitalizations, it is unclear in the current data what, if any, factors would have been present in 2006–07 and absent in 2008–09 that would drive the inconsistency in the effect. Additional research is needed into the factors that lead to both ER utilization and hospitalization among families who use emergency shelter.

The current findings are among the first to draw a connection between stress and health in the context of emergency housing for families, a finding with important implications for both practice and understanding of lifelong health disparities. However, additional work is needed to understand the direction of the effect between stress and health as well as the mechanisms that primarily contribute to this relation. The current study is cross-sectional and correlational in nature, preventing any strong claims about whether stress contributes to the etiology of disease through impacts on developing physiology as implied in an allostatic load or toxic stress account (e.g., Shonkoff et al. 2012) or whether stress contributes to the etiology of disease through its association with broader social inequities consistent with a social determinates of health account (e.g., CSDH 2008). The design of this study also precludes strong inferences about whether differences in health somehow contribute to differences in lifetime events that account for the observed relation, or whether some unobserved factor convincingly explains both differences in health and stressful lifetime events. Additional research is necessary to test proposed mechanisms through alterations in physiological functioning resulting from unprotected stress in early life. Such efforts should be prospective and longitudinal and must incorporate bodies of existing evidence regarding not only the stress-health link (to which the current results contribute), but also the impact of stress on psychosocial development, broader social inequities, and how policy and practice can intervene (Blair and Raver 2012; Evans, Li, Whipple, and Sepanski 2013; McLloyd 1998; Stephens, Markus, and Phillips 2014). In addition, it is important to examine these associations among children who experience homelessness and other adversities at different ages. For example, under an allostatic load explanation, physiological systems important for health undergo alterations following from repeated activation of stress-response systems. It may be that links between lifetime adversity and health are even stronger among older children and may not yet have emerged among younger ones. The inclusion of additional methods (e.g., assessments of physiological functioning) would also help address limitations in the current study related to overreliance on parent-report methods.

The current findings and the broader view of toxic stress are consonant with a standing policy statement by the AAP (Committee on Psychosocial Aspects of Child and Family Health et al. 2012; Shonkoff et al. 2012). The statement emphasizes an integrated framework

that incorporates recent findings across multiple disciplines within developmental science on the impact of toxic stress on multiple physiological regulatory systems implicated in the development of conditions that drive income- and race-related health disparities. For example, unprotected adversity in early life has been linked to lasting differences (either elevated or attenuated) in cortisol functioning, a glucocorticoid that plays a central role in maintaining homeostasis in multiple systems on a routine basis and following perturbation by the physiological stress-response (Gunnar and Quevedo 2007). Among other functions, cortisol has important roles in suppressing innate immune functioning and curtailing inflammation, suggesting that dysregulated cortisol would likely contribute to the conditions observed in high rates among homeless children in the current study: repeated, persistent infections and atopic disease (asthma and allergies). Furthermore, past work with both cohorts has linked stressful life events to higher levels of child cortisol (Cutuli et al. 2010, 2012), and among the 2008–09 cohort parent behavior that included more negative control was related to higher child cortisol in response to stress (Cutuli, 2011). Together with the present findings, these analyses suggest that toxic stress likely contributes to multiple physiological processes that, in turn, increase risk for health problems among children who experience homelessness. As noted above, additional research is needed to better elucidate the pathways from stress to health problems through differences in physiology.

Furthermore, the AAP Committee on Community Pediatrics released a Policy Statement on Providing Care for Children and Adolescents Facing Homelessness and Housing Insecurity (Briggs et al. 2013). The statement encourages pediatricians to recognize the antecedents of homelessness and appreciate the ways that homelessness can contribute to adverse health outcomes. The current findings emphasize that stressful events such as parental unemployment, poverty, mental illness, substance abuse, and/or domestic violence may contribute to adverse health outcomes for children living in emergency shelter. These findings also affirm recommendations made in a more recent AAP policy statement on poverty and child health, noting that the mechanisms that contribute to poor health for children from low-income families are varied and must be addressed (Council on Community Pediatrics 2016). Both statements underscore the importance of practice change, partnering with community resources, and advocacy as strategies to optimize the health of children affected by homelessness and poverty. Pediatricians have an opportunity to broaden approaches in the coordination of care by providing linkages to essential community services that will assist these vulnerable families and their children.

Reducing disparities in health for those who experience childhood homelessness requires attention to the negative impacts of adversity in early life. Developmental science reveals multiple means of accomplishing this, namely through reducing exposure to risk *and* increasing exposure to protective factors that buffer the negative impacts of adversity (Masten, Cutuli, Herbers, and Reed 2009). Attention can be paid to public housing policy for residentially unstable families to help prevent stressors related to the loss of housing and the move to emergency housing (Meadows-Oliver 2003). Similarly, access to health care is a necessary, but seemingly not sufficient, requisite for better health (Lurie and Dubowitz 2007). Helping families stay connected to pediatricians and other care providers may be difficult following the residential move into shelter. Also, it is not uncommon for parents in homeless families to express regret over needing to expose their children to certain aspects



of institutional life in emergency housing (Koblinsky, Morgan, and Anderson 1997). A limitation of the current study is that we did not measure additional sources of risk that may contribute to common disease, such as increased exposure to moisture, allergens, cigarette smoke, and infectious pathogens in shelter. Families and emergency housing providers both can work to minimize these exposures in the settings of homelessness. One component of an effective approach to reducing childhood and lifelong health problems is to promote social policies and practices that remove risks from the lives of children.

Though not considered in the current findings, supporting and encouraging exposure to protective factors is a well-established avenue for addressing the deleterious effects of childhood stress. Toxic stress explicitly refers to a child's experiencing of highly stressful experiences *outside the presence of effective external regulation* from adults, such as the buffering effects of competent parent behavior or a history of close relationships with caring adults. Other protective factors, such as good cognitive functioning, religion, or other social supports, all have been shown to ameliorate the negative impact of stressful situations in other domains (Buckner, Mezzacappa, and Beardslee 2003; Luthar 2006). Developmental science affirms the importance of these adaptive systems that allow children to cope with even extreme levels of adversity and show resilience (Luthar 2006), findings that are echoed in studies specifically with homeless families (Masten et al. 2012; Buckner et al. 2003; Miliotis, Sesma, and Masten 1999). These factors help protect healthy development and moderate the toxicity of otherwise overwhelmingly stressful situations for children experiencing homelessness. While there is still much to learn about the links between adverse life events in childhood and health, additional research explaining the powerful roles of protective factors is sorely needed. We need to embark on programmatic research beyond the current findings and those like them to understand the roles of protective factors in buffering risk for poor health.

Many protective factors can be supported and cultivated among families and individuals. Addressing parent and family needs will bolster these adaptive systems for children, especially among preschoolers. Developmental education, resources and interventions that promote positive parenting, and parent coping and stress management are all components of evidence-based interventions that buffer the negative sequelae of childhood trauma and high levels of stress (Amaya-Jackson and DeRosa 2007; Cohen and Mannarino 2008). Besides working to remove risks, health-care professionals, case managers, and emergency housing providers can connect homeless families with resources that support the processes through which children successfully adapt to stressful situations and avoid the experience of stressful life events with their negative health implications.

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## Biographies

J. J. Cutuli is an assistant professor of psychology at Rutgers University–Camden. His research looks to understand the developmental processes of resilience among children and families who experience adversity. His work considers how the interplay of factors at different levels of the individual and her context influence health and functioning.

Sandra M. Ahumada is a Ph.D. candidate in the Institute of Child Development at the University of Minnesota. Her research targets developmental systems of resilience and risk, with a particular focus on examining the processes by which early life experiences shape competence and maladaptation in children with a history of adversity, such as maltreatment and homelessness.

Theresa Lafavor is an assistant professor of clinical psychology at Pacific University. She received her Ph.D. in child clinical psychology at the Institute of Child Development at the University of Minnesota. Her research interests include risk and resilience, homelessness and trauma, pediatric neuropsychology and assessment, life span development, and parenting and family systems.

Charles Oberg is a professor emeritus in the Division of Epidemiology & Community Health at the University of Minnesota and served as the chair of the Maternal and Child Health program in the School of Public Health. He was also the chief of pediatrics at Hennepin County Medical Center and the Medical Director for the Hennepin County Homeless Assistance Project. His research focuses on the impact of health disparities and limited access to care for vulnerable populations.

Janette E. Herbers is an assistant professor in the Psychology Department at Villanova University. Her work examines developmental processes of resilience in children who experience adversity such as poverty, homelessness, and trauma, with particular attention to the protective influences of positive parenting-child relationships and children's self-regulation skills.

Ann Masten is Regents Professor and Irving B. Harris Professor of Child Development in the Institute of Child Development at the University of Minnesota. Her research is focused on competence and resilience in children and families who have experienced homelessness, war, disaster, migration, and other challenges, with the goal of understanding how to promote positive development in children at risk due to adversity. She is the author of numerous publications, including an integrative book on her work, *Ordinary Magic: Resilience in Development* (2014).

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**Table 1**

## Sample demographics by cohort

	<u>2006 – 2007</u>	<u>2008–2009</u>
Total number of children	104	138
Gender		
Female	43	78
Male	61	60
Age, mean (SD), years	6.0 (0.7)	5.8 (0.6)
Lifetime life events, M (SD)	2.91 (2.13) <sup>a</sup>	2.80 (2.24) <sup>b</sup>
Number of health problems, M (SD)	0.75 (1.04)	0.61 (0.98)
Used emergency room, past year, count (%)	38 (37%)	40 (29%)
Ever hospitalized, count (%)	24 (23%)	32 (23%)
Minority status, count (%)	101 (97%)	132 (96%)
Race/ethnicity		
Black / African American	84	91
Multiracial	15	23
Native American	-- <sup>c</sup>	8
White	-- <sup>c</sup>	6
Other	5	10

<sup>a</sup>Based on 15-item form;

<sup>b</sup>Based on 21-item form;

<sup>c</sup>Specific count < 5 and suppressed

**Table 2**

## Health Conditions

	2006–2007		2008–2009	
	Count	Percent	Count	Percent
Asthma	29	27.88%	29	21.01%
Repeated, persistent respiratory infections such as colds, bronchitis, or croup	18	17.31%	23	16.67%
Repeated, persistent ear infections	14	13.46%	9	6.52%
Bad allergies requiring doctor visits and frequent medications	8	7.69%	10	7.25%
Blood diseases, such as sickle cell anemia or hemophilia	1	0.96%	5	3.62%
Bowel diseases, such as inflammatory bowel disease or chronic constipation	2	1.92%	3	2.17%
Other chronic or recurrent lung disease	1	0.96%	2	1.45%
Repeated, persistent urinary infections	2	1.92%	1	0.72%
Congenital heart disease	1	0.96%	1	0.72%
Nerve or muscle problems such as muscular dystrophy	0	0.00%	1	0.72%
Birth defects, such as spina bifida or cleft lip	2	1.92%	0	0.00%

**Table 3**

Negative stressful life events. Primary caregivers were asked whether their child had ever experienced any of the following events.

	2006–2007		2008–2009	
	<u>Count</u>	<u>Percent</u>	<u>Count</u>	<u>Percent</u>
Lived in a home with fights or severe relationship problems between parents and adults taking care of him/her	41	39.42%	48	34.78%
Lived with a parent who was in prison	43	41.35%	45	32.61%
Experienced the divorce or permanent separation of his/her parents	39	37.50%	41	29.71%
Been separated from his/her parents for more than two weeks <sup>b</sup>	45	43.27%	39	28.26%
Seen violence happening to other people	42	40.38%	35	25.36%
Seen a parent injured by another person	26	25.00%	28	20.29%
Lived with a parent who had a mental illness	17	16.35%	27	19.57%
Lived with a parent who had a serious alcohol or drug problem	13	12.50%	17	12.32%
Other (unlisted) major event <sup>a</sup>	12	11.54%	16	11.59%
Been in a serious accident (car, bike, boat) or nearly drowned <sup>c</sup>	-	-	14	10.14%
Lived with a parent who had a serious physical illness	6	5.77%	13	9.42%
Witnessed a serious accident involving a car, plane, or boat <sup>c</sup>	-	-	10	7.25%
Been attacked by an animal <sup>c</sup>	-	-	10	7.25%
Been in a house fire <sup>c</sup>	-	-	9	6.52%
Has ever lived in a foster home	6	5.77%	7	5.07%
Been the victim of physical violence (for example, your child was seriously injured by another person or raped)	4	3.85%	7	5.07%
Experienced a natural disaster such as a flood, hurricane, or tornado <sup>c</sup>	-	-	7	5.07%
Experienced the death of a parent	5	4.81%	3	2.17%
Experienced the death of a brother or sister	4	3.85%	3	2.17%
Been kidnapped <sup>c</sup>	-	-	2	1.45%
Experienced any other severe threat to his/her life or safety	0	0.00%	2	1.45%

<sup>a</sup>One item related to hospitalization removed in other descriptive statistics and analyses

<sup>b</sup>None were related to health or hospitalization

<sup>c</sup>Item not available for 2006 – 2007



Table 4

Regression coefficients by cohort.

<u>2006–2007 Cohort</u>						
	Health problems		Any ER use (Past Year)		Any hospitalization (Ever)	
	$\beta$	<i>p</i> -value	Exp(B)	<i>p</i> -value	Exp(B)	<i>p</i> -value
Age	0.07	.49	<b>1.90</b>	<b>.05</b>	1.43	.35
Sex	0.05	.56	0.67	.35	<b>0.32</b>	<b>.04</b>
Negative life events	<b>0.27</b>	<b>.01</b>	1.01	.95	<b>1.34</b>	<b>.01</b>
<u>2008–2009 Cohort</u>						
	Health problems		Any ER use (Past Year)		Any hospitalization (Ever)	
	$\beta$	<i>p</i> -value	Exp(B)	<i>p</i> -value	Exp(B)	<i>p</i> -value
Age	-0.10	.26	0.95	.09	0.98	.49
Sex	<b>0.18</b>	<b>.03</b>	0.91	.80	0.69	.37
Negative life events	<b>0.19</b>	<b>.02</b>	1.02	.80	1.12	.20

Note:

For sex, Male = 1, Female = 0

Statistically significant effects are noted in bold.