The Impact of the 2007–2009 US Recession On the Health of Children With Asthma: Evidence From the National Child Asthma Call-Back Survey

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Given the relationship between family circumstances and child well-being, the impact of the recent US recession on the health of children is of great concern.[1] Between 2007 and 2009, the US economy experienced a severe recession that had a profound effect on workers and families.[2] Workers aged 25 to 34, who were most likely to be heading households with children in the home, were the hardest hit by the loss of jobs, which have yet to return to their pre-recession levels.[3, 4] The percentage of US children living below the federal poverty level increased from 18% in 2007 to 22% in 2010;[5] the highest percentage since 1993.[6] Limited data are available on the potential impact of the US recession on the health of children with asthma.

Due to loss of income and/or the loss of health insurance, there may be direct costs of complying with an asthma management plan for parents of children with asthma. Medications and health care visits may no longer be affordable. Furthermore, unexpectedly high levels of unemployment during a recession, and uncertainty about future job security can create anxiety, stress and depression for both employed and unemployed workers, which may make it more difficult for parents to cope and care for their child's asthma.[7] In this paper, we estimate the prevalence of poorly controlled asthma in a nationally representative sample of children with asthma and provide new findings on the factors associated with poorly controlled asthma during the "official" US economic recession.

Methods

Data were from the national 2007-2009 Child Asthma Call-Back Survey; an in-depth asthma survey jointly administered with the **Behavioral Risk Factor Surveillance System (BRFSS)**. The BRFSS is a state-specific, population-based survey of the noninstitutionalized U.S. adult population aged ≥18 years and older. BRFSS respondents who were the parent/guardian of a randomly selected child (aged 2–17 years) with current doctor-diagnosed asthma and who lived in one of the 50 states or District of Columbia at the time of the survey were included in the study sample.

The 2007 **National Heart, Lung, Blood Institute (NHLBI) Expert Panel Report 3 (EPR3)** Guidelines for the Diagnosis and Management of Asthma were used to define asthma control.[8] In order to be considered well controlled, a child with asthma must meet the five age-specific criteria listed next to "Impairment" in Table 1. The Asthma Call-Back Survey does not include a question on lung functioning. Thus, the current study may underestimate the prevalence of poorly controlled asthma.

The average state-level unemployment rate was selected as an indicator of economic conditions because unemployment best captures harsh economic conditions for working age adults when there is a downturn in the US economy. States with unemployment rates significantly higher than the US unemployment rate for three consecutive years between 2007 and 2010 were defined as high unemployment states and compared with all other states. These included California, Florida, Illinois, Kentucky, Michigan, Nevada, North Carolina, Ohio, Oregon, Rhode Island and South Carolina. Five of the 11 states (Florida, Kentucky, Nevada, North Carolina, and South Carolina) did not participate in the 2007-2009 Child Asthma Call-Back Survey and thus were not included in the final sampling frame.

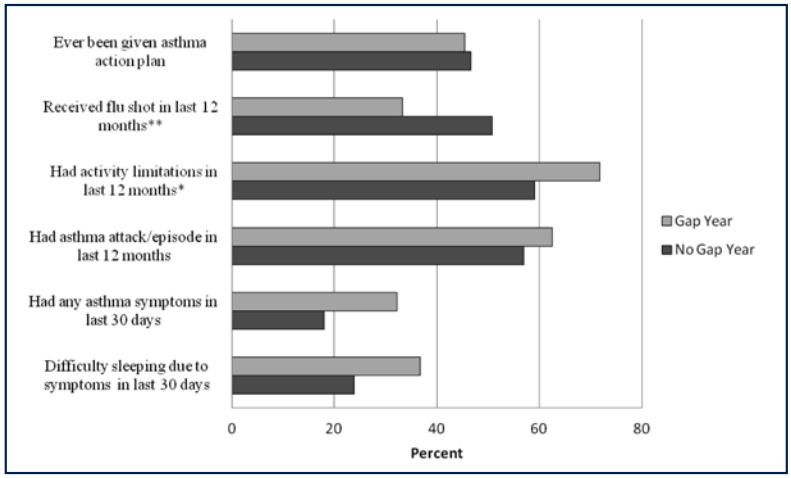
Parent-level characteristics included smoking

Table 1. Clinical guidelines for pediatric asthma control

		Well Controlled		Poorly Controlled*	
		Ages 2-11 yrs	Ages 12+ yrs	Ages 2-11 yrs	Ages 12+ yrs
Impairment	Symptoms	≤ 2 days/week		>2 days/week	
	Nighttime Awakenings	≤ 1x /months	≤ 2x /month	> 1x /month	> 2x /month
	Interference with normal activity	None		At least some limitation	
	Short acting beta-antagonist use for symptom control	≤ 2 days /week		> 2 days /week	
	Lung function [a]: FEV_1 (predicted) or peak flow personal best; or FEV_1/FVC	>80%		≤ 80%	

[a]FEV_1 is n/a for children aged 4 years and under.
Source: National Heart Lung and Blood Institute, National Asthma Education and Prevention Program, Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma, 2007

Figure 1. Selected asthma management indicators among children 2-18 years old with current asthma, by gap in health insurance



*p<.05; **p<.01

Table 2. Factors associated with out of control asthma among asthmatic children: logistic regression

	Adjusted Odds Ratio	95% Confidence Intervals
High unemployment state		
No	1.00	
Yes	0.98	0.76 – 1.27
Parent household income		
$50K or higher	1.00	
$35K to < 50K	1.16	0.83 – 1.63
$20K to <35K	1.45	1.01– 2.09
$<10K to < 20K	0.78	0.51– 1.19
Unknown	0.68	0.39 – 1.16
Parent unemployed		
Currently employed	1.00	
Out of workforce (student, retired)	1.13	0.85 – 1.50
Unemployed past 1- 2 years	0.69	0.39 – 1.25
Parent poor mental health score		
0	1.00	
1	1.37	1.01 – 1.88
2+	1.72	1.13 – 2.60
Parent current smoker		
No	1.00	
Yes	1.03	0.75 – 1.42
Child age		
2-5 years	1.37	0.98 – 1.91
6-11 years	1.13	0.89 – 1.44
12-18 years	1.00	
Child sex		
Male	1.00	
Female	1.12	0.89 – 1.40
Child race/ethnicity		
Non-Hispanic white	1.00	
Non-Hispanic black	1.27	0.87 – 1.86
Non-Hispanic other races	0.90	0.59 – 1.36
Hispanic	1.23	0.83 – 1.84
Child gap in health insurance or uninsured		
No	1.00	
Yes	1.74	1.07 – 2.83

Data source: 2007-2009 national BRFSS Child Asthma Survey; weighted data.

status, mental health, household income, and employment status. Mental health status was measured using a composite variable for poor mental health that included dissatisfaction with one's life, not getting emotional social support needed, and frequent mental distress (≥ 14 days of poor mental health in the previous month). Scores ranged from zero to three (with higher scores indicating poorer overall mental health) with a mean of 0.45 and a standard error of 0.02. Scores of two and three were combined due to the small sample size for scores of three. Child-level characteristics included age, sex, race/ethnicity, and whether the child experienced a gap in health insurance coverage in the past 12 months.

Sampling weights that correct for unequal probabilities of sample selection and adjust for non-response and telephone non-coverage were applied to the BRFSS and Child Asthma Call-Back Survey to obtain a nationally representative sample of parents with a child in the home with current asthma. A multivariable logistic regression model measured the strength of the association between study variables and poorly controlled asthma.

Results

Of the 5,138 children aged two to 17 years included in the present analysis, 69.1% were classified as having poorly controlled asthma. The prevalence of poorly controlled asthma did not vary significantly by children's age, gender, or race/ethnicity. However, children who had a gap in health insurance in the 12 months before the Asthma Call-back Survey were significantly more likely than children with continuous health care coverage to have poorly controlled asthma (No Gap: 68.0%, 95% Confidence Intervals [CI] 65.5-70.5; Gap: 80.6%, 95% CI 73.7-87.8).

Analyses of various indicators of asthma management revealed that less than 50% of children aged two to 18 years with current asthma received an asthma action plan or a flu shot in the last year, despite the fact that the 2007 NHLBI guidelines recommend that individuals with asthma have an asthma action plan that is reviewed at every health care visit and receive a flu shot each year.[8] Additionally, one-fourth of children had nighttime asthma symptoms (25.1%), more than half (57.4%) had at least one asthma attack or episode in the past year, and more than half (60.2%) reported activity limitations due to asthma. Comparisons between those who had a gap in insurance coverage and those who did not have a gap in coverage are displayed in Figure 1. Those who had a gap in insurance coverage were significantly more likely than those who had continuous coverage to experience activity limitations (p<.05) and were significantly less likely to have received a flu shot (p<.01).

In multivariable regression analyses adjusted for all study variables, poorly controlled asthma was significantly associated with a household income between 20K and <35K, a parent reporting poor mental health, and a gap in the child's health care coverage during the 12 months preceding the survey (Table 2).

Conclusion

Our results showed that children who experienced a gap in health insurance during the recent economic recession were at increased risk of poorly controlled asthma compared to children with continuous health insurance coverage. Consistency of insurance coverage for children with asthma is especially important. Recent studies have found that discontinuous health insurance is associated with poorer overall quality of care for children with asthma and greater burden on families.[9-11] These studies, like our study, support efforts to prevent children with asthma from falling through the cracks of the health insurance system.

Between 2007 and 2010, the number of children with employer-based coverage fell by 3.4 million as unemployment remained stubbornly high. We hypothesized that children with asthma in states severely affected by high unemployment, such as Rhode Island, would be the most likely to experience poor asthma control, but this was not the case. The historic expansion of the **State Children's Health Insurance Program (S-CHIP)** in 2009 offset the loss of employer coverage for income eligible children.[12, 13] While 4.6 million children gained Medicaid or CHIP coverage between 2007 and 2010, eight million children remained uninsured.[14]

This study also found that children in households with incomes of 20K to <35K, were more likely than children in the lowest and highest income families to have poorly controlled asthma. Increased federal and state investments in Medicaid and S-CHIP did not help all eligible households in need. Some states chose not to expand eligibility to the S-CHIP program.

Some low wage workers with dependent children may not have qualified for their state's S-CHIP program as they cycled in and out of the labor market entering and then exiting the ranks of the unemployed. It is worth noting that the Child Asthma Call-back Survey did not include all states with above average high unemployment rates, or information on states' eligibility criteria for S-CHIP, which may have affected our findings.

The expansion of S-CHIP was an important investment in children's well-being and a policy deserving of support in the wake of the recent recession and its aftermath. Still, access to health insurance is not synonymous with receipt of health care. Although children with health insurance receive more consistent care and have better health outcomes than children who lack coverage,[1, 15] access to publicly funded health insurance does not guarantee access to quality health care or the receipt of consistent preventive asthma care for children with asthma.

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