

# Assessment of Health Complaints among Pediatric Residents of FEMA-Supplied Trailers and Mobile Homes in Hancock County, Mississippi

## BACKGROUND

In response to pediatricians' reports of increased visits for respiratory illnesses among children living in FEMA-supplied trailers and mobile homes in Hancock County, Mississippi, after Hurricane Katrina, the Mississippi State Department of Health requested CDC's assistance in conducting a case series investigation to compare the proportion of visits with indoor air quality (IAQ)-related diagnoses before and after the hurricane and to characterize these proportions with regard to trailer or mobile home occupancy. This report summarizes the results of that investigation.

## METHODS

Data collection for this investigation had two components:

- 1) chart abstraction to obtain medical information on health care visits from each of five major health care providers (one hospital and four pediatric practices), and
- 2) telephone interviews to obtain information from parents/guardians about trailer or mobile home occupancy after Hurricane Katrina and on place of primary residence.

Medical records were selected for abstraction if:

- 1) the child was aged 2 to 12 years at the start of the study (August 29, 2004);
- 2) the child had at least one health care visit potentially related to an indoor air quality (IAQ) issue before Hurricane Katrina (August 29, 2004, to August 28, 2005); and
- 3) the child resided in Hancock County.

A child was included in the study if a parent/guardian completed the telephone interview and confirmed the child's primary residence in Hancock County for the total study period (both before and after Hurricane Katrina from August 29, 2004 to August 28, 2007). Each of the five health care facilities had at least some medical records that had not been destroyed and were included.

Investigators reviewed 934 records, some from each facility, and found records for 264 (28%) children that met the criteria for chart abstraction and telephone interview. CDC completed telephone interviews for 168 children. Most (144/168; 86%) met all study criteria for analysis, and of these, 96 (67%) currently lived or had lived in trailers or mobile homes.

At the beginning of the study, an estimated 31.9% of children were aged 2 to 4 years, 45.1% were aged 5 to 8 years, and 22.9% were aged 9 to 12 years; 56.3% were male; 93.1% were white, and 55.6% had private insurance. The children had a mean age of 69.6 months (standard deviation 33.2 months). In comparison with the overall group of children in the study, a greater proportion of those who had lived in trailers and mobile homes had Medicaid coverage (50.0% vs. 40.3%).

## FINDINGS

1. Investigators reviewed the records of 144 children who lived in the area during the year before and also during the second year after Hurricane Katrina (Table 1). These 144 children had 411 health care visits potentially related to IAQ during the year before Hurricane Katrina. Their visits decreased the year after the hurricane (272 visits) but returned to before-hurricane levels by the second year (414 visits). The decrease in number of visits during the first year after the hurricane is likely because many health care facilities had closed and many families had temporarily evacuated.
2. Among all 144 children, the proportion of visits with upper respiratory (e.g., cold-like) diagnoses decreased from 62.8% (258/411) in the year before to 59.6% (162/272) in the first year after, then to 52.4% (217/414) in the second year after Hurricane Katrina. The proportion of visits with lower respiratory (e.g., bronchitis-like) diagnoses was 22.4% (92/411) in the year

before, and 22.4% (61/272) in the first year after Hurricane Katrina, then increased to 31.2% (129/414) in the second year after Hurricane Katrina (Table 1).

3. The decline in the proportion of visits with upper respiratory symptoms and the increase in the proportion of visits with lower respiratory symptoms were similar for children living in FEMA-supplied trailers and mobile homes as for those who had not lived in FEMA-supplied housing (Table 2). The increase in the proportion of lower respiratory diagnoses among all children in the study might be attributable to a) the individual pre-dispositions of children, b) sampling, or c) some other factor.
4. Hurricane Katrina had a substantial impact on all aspects of the local health infrastructure. Health care facilities, medical information systems and thousands of medical records were destroyed, creating a particularly challenging environment for performing a retrospective case series investigation. Two and a half years after the event, the area's medical capacity is still recovering.

## LIMITATIONS

Because of the circumstances related to the aftermath of Hurricane Katrina, the findings in this report are subject to at least five limitations.

1. Destroyed records and disrupted information systems prevented inclusion of a large number of children that might otherwise have been eligible, and it is unclear whether the children included are representative of all children in Hancock County.
2. Absence of denominator information on the population at risk, coupled with an unknown number of missing records, prevented calculation of population-based rates; therefore, CDC focused its analysis on the proportion of health care visits.
3. Residing in Hancock County after Hurricane Katrina was a criterion for eligibility for the study. Unknown factors likely influenced a family's decision to return and to reside in Hancock County after Hurricane Katrina, and these factors could be associated with health outcomes, either increasing or decreasing apparent illness measured after the Hurricane.
4. Only sick children who visited one of the five health care facilities at least once in the year before Hurricane Katrina were included, potentially biasing comparisons; however, as is typical among children in general, most of these sick visits were likely for acute illnesses in otherwise healthy children.
5. To be included in the study, children were required to have at least one health care visit potentially related to an indoor air quality (IAQ) issue during the year before Hurricane Katrina. This could potentially introduce a selection bias; however, an analysis of only children with one or more visits both before and after Hurricane Katrina did not change the overall results (i.e., increased proportion of visits for lower respiratory diagnoses in the second year after Hurricane Katrina). On the other hand, concerns about environmental issues and respiratory illnesses among parents might have resulted in increased health care visits after Hurricane Katrina, another possible reason that might explain the observed pattern of visits.

The nature and quantitative effects resulting from these issues are unmeasured and remain unknown.

## CONCLUSIONS

1. Basic medical information systems in Hancock County were severely compromised by the effects of Hurricane Katrina, creating a particularly challenging environment for performing a retrospective investigation.

2. The number of health care visits per child remained the same for the two main periods, the year before Katrina and the second year after Katrina. There was a shift of health care visits from upper respiratory complaints the year before Hurricane Katrina to lower respiratory complaints the second year following Hurricane Katrina. This pattern was seen in children living (or having lived) in temporary housing units as well as in children who had never lived in temporary housing units.
3. The experience of living through Hurricane Katrina continues to affect Gulf Coast communities, is multifaceted, and has affected children's health.

## TABLES

Table 1. Primary diagnosis, visit type, and visit per child (N=144), by year—Hancock County, Mississippi

Characteristics	Year before Katrina (8/29/04 – 8/28/05) 411 visits		First year after Katrina (8/29/05 – 8/28/06) 272 visits		Second year after Katrina (8/29/06 – 8/28/07) 414 visits	
	n	(%)	n	(%)	n	(%)
	<b>Primary diagnosis</b>					
Upper respiratory	258	(62.8)	162	(59.6)	217	(52.4)
Lower respiratory	92	(22.4)	61	(22.4)	129	(31.2)
Allergy	44	(10.7)	32	(11.8)	50	(12.1)
Abdominal	14	(3.4)	12	(4.4)	15	(3.6)
Headache	3	(0.7)	5	(1.8)	3	(0.7)
<b>Visit type</b>						
Physician's office	360	(87.6)	232	(85.3)	374	(90.3)
Emergency department	46	(11.2)	36	(13.2)	37	(8.9)
Hospitalization	5	(1.2)	4	(1.5)	3	(0.7)
<b>Visits per child</b>						
Mean	2.9		1.9		2.9	
Median	2.0		1.0		2.0	
Range	1-19		0-9		0-15	

Table 2. Primary diagnosis and visit type, by temporary housing unit occupancy and year—Hancock County, Mississippi

Characteristics	Temporary Housing Unit Occupancy*											
	Yes (N=96)						No (N=48)					
	782 visits						315 visits					
	Year before Katrina <sup>†</sup> (n=288)		First year after Katrina <sup>§</sup> (n=195)		Second year after Katrina <sup>¶</sup> (n=299)		Year before Katrina <sup>†</sup> (n=123)		First year after Katrina <sup>§</sup> (n=77)		Second year after Katrina <sup>¶</sup> (n=115)	
n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
<b>Primary diagnosis</b>												
Upper respiratory	187	(64.9)	116	(59.5)	158	(52.8)	71	(57.7)	46	(59.7)	59	(51.3)
Lower respiratory	63	(21.9)	41	(21.0)	89	(29.8)	29	(23.6)	20	(26.0)	40	(34.8)
Allergy	25	(8.7)	22	(11.3)	36	(12.0)	19	(15.5)	10	(13.0)	14	(12.2)
Abdominal	12	(4.2)	12	(6.2)	13	(4.3)	2	(1.6)	0	(0.0)	2	(1.7)
Headache	1	(0.4)	4	(2.1)	3	(1.0)	2	(1.6)	1	(1.3)	0	(0.0)
<b>Visit type</b>												
Physician's office	244	(84.7)	166	(85.1)	263	(88.0)	116	(94.3)	66	(85.7)	111	(96.5)
Emergency department	40	(13.9)	27	(13.9)	34	(11.4)	6	(4.9)	9	(11.7)	3	(2.6)
Hospitalization	4	(1.4)	2	(1.0)	2	(0.7)	1	(0.8)	2	(2.6)	1	(0.9)

\*People who lived in temporary housing unit for any period after Hurricane Katrina

<sup>†</sup>8/29/2004 – 8/28/2005; <sup>§</sup> 8/29/2005 – 8/28/2006; <sup>¶</sup> 8/29/2006 – 8/28/2007