Out of Breath:  
Childhood Asthma, Poverty and Housing

Children who live in substandard housing may be paying a high price with their health. This paper examines the relationship between childhood asthma, concentrated poverty and substandard housing in the Louisville metropolitan region.

An estimated 20,000 children are affected by asthma in the Louisville area alone and the number of them with severe asthma is growing.1

Concentrated poverty and substandard housing each have a direct impact on childhood asthma. In Louisville Metro, children who live in neighborhoods with high rates of poverty are more likely to go to the emergency room or be hospitalized for asthma.

Data in this report also show that in neighborhoods which are likely to have a lot of substandard housing, children are more likely to suffer from severe asthma conditions, resulting in hospitalization, than those who live in neighborhoods with a higher quality of housing.

The provision of decent, affordable housing across the region is essential if we are to ensure that children’s health does not deteriorate simply because of where they live. Currently, affordable housing in Louisville is highly concentrated in relatively few areas, leaving low-income working families few alternatives should their housing conditions pose health risks for their children.


Metropolitan Housing Coalition
Childhood Asthma in the Louisville Metropolitan Area

- Since 2000, there have been nearly 1,400 children hospitalized with the primary diagnosis of asthma in Louisville and surrounding Kentucky counties.

- More than half of child asthma hospitalizations in the Louisville area are for children younger than 5.

- More than half of child asthma hospitalizations in Louisville Metro were for children living in just 8 of the 39 Metro zip codes. All 8 zip codes are low-income communities.

- Child asthma hospitalizations rates ranged from no children in some zip codes in eastern Louisville where poverty rates are under 3 percent, to 495 per 100,000 children in zip code 40208 where the poverty rate is 23 percent.

- In Louisville Metro zip code 40208, the child asthma hospitalization rate was 1.6 times that of the nation and 18 times higher than rates in some eastern Jefferson County zip codes.

- In 2003, there were more than 1,700 asthma related emergency room visits to Kosair Children's Hospital from Jefferson County children alone. Almost half of those emergency room visits were by children from just 6 zip codes.

- Kosair Children's Hospital data indicate that twice as many African American children in Louisville Metro make emergency room visits due to asthma as white children.

2002-03 Total Asthma Hospitalizations in Louisville KY–IN MSA* Ages 0-14

There were 738 child asthma hospitalizations during 2002-03 in the region, including 650 in Jefferson County.

The Costs of Childhood Asthma

Childhood asthma not only presents challenges to children’s overall health and well-being, but children with asthma often miss school. Parents and their employers lose productivity at work when parents must stay home or seek treatment for their children. The direct financial costs of treatment and hospitalization to families and the community are also great.

- In 2003, the annual cost of emergency room visits at Kosair Children’s Hospital was $3.2 million.

- The estimated annual cost of hospital stays for children 0-14 in Louisville Metro in 2003 was over $2.8 million.

- Twenty-four children stayed an average of 10 days in intensive care at Kosair Children’s Hospital in 2003, at a total cost of $1.3 million.

These estimated health care costs should be considered a low estimate. Emergency room costs included here are limited to one local health care provider, Kosair’s Children’s Hospital. Estimates do not include treatment sought in physician’s offices or medication costs.
Asthma comes from the Greek word &omicron;panos, meaning “to pant” or “to breathe hard.” When someone with asthma comes in contact with an allergen or “trigger,” the muscles around their airway walls constrict, making it difficult to breathe. Common symptoms are coughing, wheezing, chest tightening, and shortness of breath. Young children often have a series of related illnesses, such as pneumonia or bronchitis, before being diagnosed with asthma.²

Both indoor and outdoor environmental triggers have an impact on the severity of a child’s asthma condition. While heredity plays a role, severe asthma symptoms are more likely to occur when a person with asthma is bombarded with several triggers at once. For example, if a child lives in an apartment that has excessive moisture because of leaky plumbing and is in a neighborhood with poor air quality, these indoor and outdoor triggers act together to increase the chances of an attack.³

Second-hand smoke, exhaust fumes from vehicles, and industry toxins such as particulates and butadiene are also associated with an increased severity of asthma symptoms.⁴

Recent studies cite mounting evidence that indoor allergens are often key aggravators of asthma, from its onset to an increase in the severity of symptoms.⁵ Many children are spending increasing amounts of time indoors. This is especially true in urban areas where parents believe the presence of crime or drug activity means their children cannot play safely outdoors.

Children who live in neighborhoods with high poverty rates may have more severe asthma symptoms because of their community’s lack of resources. Neighborhoods with high poverty rates are often plagued by factors that increase the risk of environmental triggers for childhood asthma, such as abandoned properties, old industrial sites, and poor quality housing.

Families in neighborhoods with high poverty rates may have limited access to affordable, primary health care or their children may have symptoms that more often require emergency or in-patient treatment. Their neighborhoods may be located near major traffic corridors or industrial sites that increase their exposure to toxins. Finally, their housing options can be very limited.

Severity of symptoms

Timely medical care is essential in managing childhood asthma. In some cases, emergency room visits and hospitalizations signal that a child has not had adequate outpatient management of the disease.

However, several studies suggest that emergency room visits are not being used to replace primary care. Rather, there is evidence that those who use emergency rooms are a “less healthy population” than those who do not.6,7 In other words, more children in Louisville neighborhoods with high poverty rates may have severe asthma symptoms than children who live in neighborhoods with low poverty rates.

Many, though not all, of the Louisville zip codes with the highest hospitalization rates are predominately African American. Nationally, African Americans are five times more likely to seek emergency room care for asthma than whites and three times more likely to be hospitalized for asthma.8

The African American child population in Metro Louisville is 25 percent. However, Kosair Children’s Hospital data indicate that African American children make up 63 percent of child asthma related emergency room visits. These data provide only a snapshot of Louisville emergency room visits. We need more extensive data, from all local hospitals, to provide a better picture of racial disparities related to emergency room use.

Neighborhood air quality inequities

Studies have repeatedly linked air pollution to increased incidences of childhood asthma. A report by the U.S. Environmental Protection Agency found that racial minority and low-income populations experience higher levels of exposure to selected air pollutants than other populations.9

During 2000-2001, an extensive air quality study was conducted in West Louisville.10 Results showed chronic risk levels of both volatile organic compounds and other toxins at all 12 West Louisville monitoring sites. Five of the monitoring sites are in zip codes with the highest child asthma hospitalizations rates (40210 and 40211). Many of the toxins cited in the report have been associated with aggravated respiratory problems and increased emergency department visits and hospitalizations for asthma.11

Limited housing choices

A very high poverty rate, of about 38 percent of a neighborhood’s population or more, signals a high risk of substandard housing in a neighborhood. However, choosing to move to a well-maintained apartment, a better constructed house, or into a healthier neighborhood are rarely options for low-income families given what they can afford to pay for housing. For a family in Louisville Metro to pay the fair market value of nearly $600 a month for a three-bedroom rental, they need an annual income of at least $34,000.12

In Louisville Metro neighborhoods with the highest numbers of asthma related child emergency room visits, many families are paying more than a third of their incomes on rent. In Louisville Metro zip codes 40202, 40203, 40211, and 40212, which include the neighborhoods of Smoketown, Shelby Park, Russell, Portland, and Park Duvalle, almost half of families pay more than a third of their incomes on rent. In these same neighborhoods, more than one in five families pay over half of their incomes on rent.

Since 2001, emergency room visits at Kosair Children's Hospital among African American and Hispanic Children have steadily increased, while the numbers for white children declined until 2004, when they rose slightly. For children of other races who sought emergency asthma treatment at Kosair, numbers remained relatively constant over the four-year period.

Source: Kosair Children's Hospital
The maps on the opposite page show that most neighborhoods with high child asthma hospitalization rates fall within areas of high risk for substandard housing. Further, there are no high child asthma hospitalization rates in areas of the city with little substandard housing. Increasingly, studies link substandard housing with a host of chronic illnesses such as asthma, even after controlling for factors such as income and smoking indoors. Substandard housing, or housing in which conditions are deemed less than suitable to maintain good health, encompasses a number of potential variables.

### Housing conditions

Housing in dire need of external repairs to the degree that roaches or mice enter the building would be considered substandard housing. One childhood asthma study involving inner-city children found that cockroach exposure was a major factor for asthma severity. Likewise, when a leaky roof or poor plumbing causes mold to form, excessive moisture in the air acts as an asthma trigger.

Due to limited local housing condition data, several census variables were selected that signal substandard housing in Louisville Metro to create the map on the opposite page. These variables were combined and weighted to determine the substandard housing risk level (low, medium, or high) across the city.

### Poverty

In neighborhoods where most households are earning low wages, including California, Smoketown/Shelby Park, Portland, and Shawnee, childhood asthma hospitalization rates far exceed the national rate. Louisville Metro’s highest child asthma hospitalization rates are in six Louisville high poverty zip codes, 40202, 40203, 40208, 40210, 40211, and 40212.

#### Renting versus owning

Families who rent cannot necessarily afford extensive repairs to reduce major asthma triggers. If repair or maintenance requests to landlords go unanswered, or are not timely, children’s respiratory conditions may deteriorate. Across the nation, some communities have taken on aggressive structural remedies of deteriorating housing by investing an average of $8,000 per home to remove mold, repair leaks, install new ventilation systems, or remove old carpet.

### Overcrowding

For families who may live with several family members but cannot afford to rent a larger apartment or house, cramped conditions can lead to inadequate ventilation or increased clutter. These factors are linked with excess dust and potential pest infestations, both of which exacerbate asthma symptoms.

### Median house value

Across Louisville Metro, median house values range from $32,000 in areas of high substandard housing risk to up to $301,000 in areas with low risk. While there are several ways to reduce asthma triggers inside the home, when a child with asthma lives in a well-constructed and well-maintained home, it can have a positive impact on that child’s health.

By repairing substandard housing, or in some cases, replacing it with safe, affordable housing, our community can support families whose children suffer from severe asthma symptoms. When health and housing advocates work together, we can make homes and neighborhoods healthier for all children.

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**Census Variables that Signal Substandard Housing**

1. Population below poverty
2. Vacant
3. Renter-occupied (vs. owner-occupied)
4. Crowding (>1 person per room)
5. Lacking heat
6. Lacking complete plumbing facilities
7. Lacking complete kitchen facilities
8. Median year structure built
9. Median house value

For methodology and data sources, visit www.metropolitanhousing.org

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Asthma Hospitalization Rate Per 100,000 Children 0 – 14
Louisville Metro Zip Codes 2000–2003

Areas with the highest child asthma hospitalization rates are: 40208, 40211, 40202, 40210, 40212, and 40203. Rates in each of these zip codes exceed the national child asthma hospitalization rate of 308 hospitalizations per 100,000 children ages 0–14.

Cartographic Modeling of Factors Associated with Substandard Housing
Louisville Metro Census Tracts

Areas in the city with high substandard housing risk cluster in and around these zip codes: 40203, 40208, 40210, 40212, and 40215.

Note: Hospitalization data reflect hospitalization discharges; not individual children. A single child may have been hospitalized more than once during a year and would be counted as more than one hospital discharge. Data are for primary diagnosis of asthma.

Housing and Health Advocates Working as Partners

While there is no cure for asthma, the disease can be managed by reducing asthma triggers and following recommended medication regimens. Here are some ways housing and public health advocates are working nationally to stem the tide of severe childhood asthma.

- **Address concentration of poverty in the region**
  a) Strengthen federal, state, and local policies to improve access to primary health care for children with asthma
  b) Identify and remediate brownfields, properties contaminated by hazardous materials and industrial pollution sources in high poverty neighborhoods
  c) Ensure that there is a better geographic distribution of affordable housing in our community
  d) Work with transportation planners to mitigate congested main thoroughfares near high density, lower cost housing

- **Eliminate substandard housing**
  a) Develop a regional healthy homes initiative
  b) Systematically identify and remediate unhealthy housing stock
  c) Support families to improve their home environment, reducing exposure to allergens and irritants

- **Aggressively identify and treat childhood asthma**
  a) Expand prevention and outreach strategies by providing simple tools for families to better manage asthma
  b) Monitor asthma prevalence and incidence to improve intervention strategies
  c) Provide “asthma mobiles” that take the treatment into communities

Acknowledgements: The Metropolitan Housing Coalition would like to thank those who contributed to the development of this issue paper: Dr. Adewale Troutman and Sheila Anderson of the Louisville Metro Health Department, Dr. David Tollerud of the University of Louisville’s School of Public Health and Information Sciences, Mark Fazey and Patricia McClendon of the Kentucky Department for Public Health, Ivy Sams of the Kentucky Department of Medicaid Services, Beth VanCleave of Kosair Children’s Hospital, and Rosanne Kruzich.

Data partners include Kentucky Department for Public Health, Health Policy Branch, Kosair Children’s Hospital, and the Louisville Metro Health Department.

Photography: Geoff Oliver Bugbee

Special thanks to Dr. Carol Hanchette of the University of Louisville, Department of Geography & Geosciences, for mapping and data analysis on substandard housing in Louisville Metro.

Report author: Valerie Salley