Not Safe at Home

How America's Housing Crisis Threatens the Health of Its Children

A Research Report

by

The Doc4Kids Project
Boston Medical Center
Children's Hospital

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Project Directors
Megan Sandel, M.D. and Joshua Sharfstein, M.D.

Report Editors
Joshua Sharfstein, M.D. and Megan Sandel, M.D.

Other Contributors
Seth Kaplan, M.D., Tracy King, M.D., and Mary Pulaski, M.D.

Illustrator
Jack Maypole, M.D.

Other Doc4Kids Participants
Sarita Chung, M.D., Jack Maypole, M.D., Katie Plax, M.D., Rob Nordgren, M.D.

Administrative Support
Jessica D'Arcy
Rebecca Onie

Financial Support
Barry Zuckerman, M.D.
Boston Medical Center Department of Pediatrics

Reviewers
Felicia Collins, M.D., Lois Doerr, R.N., Josh Greenberg, J.D., Alan Meyers, M.D., Sean Palfrey, M.D., Suzanne Steinbach, M.D., Paul Wise, M.D., Jean Zotter, J.D., Barry Zuckerman, M.D.

Address
Doc4Kids Project, c/o Department of Pediatrics, Dowling 3,
Boston Medical Center, 818 Harrison Avenue, Boston MA 02118.
Phone: (617) 534–2229. Email: doc4kids@bu.edu

The Doc4Kids Project

As doctors training for a career in pediatrics, we care for children whose life–threatening asthma attacks are made worse by bedrooms infested with cockroaches. We tend to the wounds of toddlers who live in unsafe apartments. We chart the slow recovery of schoolchildren whose brains have been poisoned by lead and watch as clean–up efforts at home come too little and too late. We provide care for the numerous ailments of homeless children as they wind their way through the shelter system.

Time and time again, we try to help our most vulnerable patients and their families find safe, affordable housing. But even when poor housing is the cause of a child's illness, we have watched families wait months and even years for safer, subsidized housing.

The Doc4Kids Project developed out of our clinical experiences to expose and detail the consequences of America's housing crisis for its children. Through a national internet campaign (using our email address doc4kids@bu.edu), we have obtained stories from pediatric caregivers of children whose health has been compromised by poor housing and whose health has been improved by housing assistance. We have also reviewed the world's medical literature to estimate the total impact of inadequate housing on child health in this country.

Our goal is to shed new light on an old problem. By shedding light on this tragedy and putting human faces on its victims, we would like to redefine America's housing crisis as a catastrophe for child health. Seen through a pediatrician's eyes, housing is a medical as well as a social need. As welfare reform leads many families into work, support for quality housing will become even more important.

While we have changed names, all stories in this report are true.

We appreciate the assistance and support of the National Alliance to End Childhood Lead Poisoning, the National Low-Income Housing Coalition, *Pediatric News* and the *American Academy of Pediatrics News*. Most of all, we thank all the caregivers who sent us stories and the children and families who inspired them. We hope you find our report interesting and relevant. Please send us any questions, comments, stories and ideas.

Joshua Sharfstein, M.D. Megan Sandel, M.D.

Selections from Stories Submitted to *doc4kids@bu.edu*

Boston:

I just witnessed the reunification of a young mother with her three children in a homeless shelter. The family had previously lived together in an overcrowded apartment with several other members of their extended family. When the three children (ages two, five and six) all tested high for lead, the mother voluntarily signed the children over to custody of the Department of Social Services so they could be placed in a lead-free home. The mother then tried and failed to find a safe and affordable apartment for her family; moving to a shelter became her only chance to live with her children in safety. She is now homeless, searching for affordable housing, with little hope for securing a unit. At least her children have their mother back.

Philadelphia:

I care for a family in my clinic that is made up of a 1-year-old, 2-year-old, 5-year-old and 25-year-old mother. The family lives with the mother's parents for financial reasons. On a home visit with the family, I discovered that the grandfather is terminally ill, and the entire first floor of the home is being used as his hospital room. The children must go through the room to reach the kitchen, small family room, and their bedroom. There are 15 or so medicine bottles within reach of the two older children as well as syringes and needles. The whole family sleeps in the same room in a single bunk bed. The portable potty trainer for the 2-year-old sits at the corner of the room. The children have not had any ingestions, but have come to the emergency department for multiple laceration and head trauma from falling from the bunk bed. For now, the mother has no financial way out of her living situation.

San Francisco:

A set of stories would not be complete without Billy, a Cambodian boy with Apert's syndrome and a tracheostomy who lives in a single room with around eight siblings. His home care nurse told me she has suctioned a cockroach out of his tracheostomy collar.

Seattle:

I cared for a 8 year old boy with a forearm fracture after falling while climbing on a rickety broken fence in the VERY small outside area they had to play in. I have also watched gang behavior develop in these boys (believe me, I would join a gang, too, if I had to roam those halls alone!), but I guess some people don't consider that health–related...

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I.

U.S. CRISIS: THE BACKGROUND

HOUSING FACTS

Nearly 2 million U.S. families with children have "worst case housing needs," meaning "unassisted with rent burden of 50 percent of income or more, or severe physical problems" in the apartment.

Dimensions of the Crisis

For approximately *10 million* American families, housing is too expensive, substandard, or both.[1]

Cost: The U.S. Department of Housing and Urban Development (HUD) considers housing to be affordable if it consumes less than 30 percent of a family's income. But according to the 1993 American Housing Survey, conducted by the Census Bureau:[2]

- About three of four poor U.S. families spend more than 30% of income for rent.
- More than one–third of very low income families spend over *70%* of their income for rent.

Quality: Housing is considered severely physically inadequate if it "lacks complete plumbing or a complete kitchen, has inadequate heating, has structural or maintenance problems and/or lacks adequate electricity."[2] From the 1993 housing survey:

- Over 1.2 million U.S. households live in housing with severe or moderate physical problems.
- 700,000 poor renter households suffered in overcrowded living conditions.[3]

Families with children have some of the most acute housing needs. According to HUD, in 1989, *nearly 2 million* families with children suffered "worst case housing needs," meaning "unassisted with rent burden of 50 percent of income or more, or severe physical problems."[1]

Homelessness

When there is no shelter—or when available shelter is unbearable—families turn to the streets. The General Accounting Office estimated in 1989 that 41,000 to 107,000 children are literally homeless on any given day, with 39,000 to 296,000 more in "doubled up" or shared housing.[4]

Housing Programs

Government programs help families in two ways: either by providing apartments at low rent or by giving certificates for subsidies and allowing families to find their own apartments.

These programs play a critical role for recipients: over half of poor renter households with housing costs less than 30% of income lived in subsidized housing in 1993.[3]

However, since there is no guarantee of assistance, the vast majority of eligible families (several *million* each year)[5] cannot participate in these programs.

Public Housing: Government–run housing began in 1937, when the national government distributed money so local housing authorities could build low–income dwellings. Over time, these buildings concentrated the urban poor, and many developments became dangerous and ill kept. Support for building new developments evaporated. Still, 1.3 million families live in public housing.[6] The average waiting time is nearly a year and a half.[7]

Housing Subsidies: The federal government also provides portable

housing assistance to 1.5 million poor families in the form of Section 8 certificates. This form of housing aid allows families to choose where to live, while guaranteeing that they do not have to pay more than 30% of their income for rent.

Section 8 funds also directly support thousands of housing units for use by poor families (otherwise known as "project based" Section 8). Many 15–20 year contracts for housing built 15–20 years ago are now expiring, requiring major new outlays just to maintain available low income housing.[8]

The waiting list for Section 8 averages over three years.[7]

Current Legislation

Congress is currently considering legislation to revamp public housing assistance. While the threat of the elimination of all housing aid looms, it appears not to be a danger in this fiscal year.[9]

Congressional attention has instead focused on the waiting list for housing assistance: who should get priority?

House Republicans, lead by Representative Rick Lazio of New York, have attempted to set aside housing units for families earning 30 to 80% of an area's median income—at the expense of an area's poorest families.

In theory, having wealthier families in public housing developments will improve maintenance as families pay more for rent while preserving an economic balance. However, housing advocates have pointed out that the poorest families have nowhere to go. If Section 8 vouchers for the very poor are also cut back, then thousands more families may wind up homeless.

As Christopher Jenks, author of "The Homeless," wrote in the New York Times, "If Congress wants to reduce the number of very poor families in public housing, it should make it much easier for such families to get Section 8 certificates...[But] a housing law that simply denies the existence of [the poorest] families could easily turn out to be worse than what we have now."[7]

CONSEQUENCE #1: ASTHMA AND RESPIRATORY DISEASE

*When 5 year old **Jose** and his 3 year old sister **Maria** suddenly developed breathing problems, their doctor was puzzled. The usual medical treatments didn't work, and the symptoms persisted even after their mother followed instructions to rid the apartment of rugs, dust and cockroaches. The pediatrician initially disregarded the mother's frustration with her neighbor's smoking—until she realized that the smoke flowed right into Jose and Maria's apartment through a large hole in the living room wall.*

In asthma, the airways of the lungs become irritated and swollen enough to cause difficulty breathing. An asthma attack feels like trying to catch air while breathing through a straw. If uncontrolled, asthma can progress to the point where the airways are swollen shut; indeed, asthma kills hundreds of U.S. children each year.[10]

Doctors can often treated asthma attacks with medication, but prevention requires changes at home: removing or decreasing common irritating factors including smoke, cold, dust mites, and, most recently discovered, cockroaches.

However, as Jose and Maria's situation illustrates, sometimes these simple causes of asthma attacks are anything but easy to control.

Asthma on the rise

Asthma is the most common chronic illness in childhood[11] affecting an estimated 11 to 12 percent of black children and 8 to 9 percent of white children in inner cities.[12] In the last decade, this common illness has become much more common, increasing by 29 percent.[13] The hospitalization rate for asthma is almost three times as high among African–American children under the age of 5 compared to their white counterparts[14] and the mortality rate is significantly higher as well.[15] This racial difference has been explained in large part by African–Americans' poor access to a regular source of health care.[12]

Substandard housing triggers asthma attacks by exposing residents to irritating factors including smoke, cockroaches, dust mites, mold, rats and mice. In allergic children, long–term exposure to these substances can be life–threatening. Dry heat and lack of heat can also cause dangerous asthma flares.

***Lawton** is an 11–year boy who has been admitted to the hospital 5 times over the last 9 months for asthma. His roof at home leaks water into the living area, and he is allergic to mold, dust mites and cockroaches. Their landlord has ignored requests to repair the apartment, and his mother feels "trapped" because she cannot afford to move.*

Cockroaches

Inadequate housing and overcrowding are commonly associated with infestations of cockroaches, rats and mice. Studies have estimated that almost half of poor children live in housing overrun with such pests in comparison to only 12% of nonpoor children.[16]

There is mounting evidence that cockroach exposure causes worsening of children's asthma. A 1997 study found that children allergic to cockroaches who were exposed to them at home suffered:[17]

- 3.4 times more hospitalizations than other asthma patients

- 78% more unscheduled visits to health care clinicians
- More days of wheezing
- More nights awake struggling to breathe
- More missed school

Ashley *and* ***Ron****, ages 15 and 13, were visiting their lung doctor recently because they have spent many nights in the hospital this year due to asthma. Both are known to be allergic to cockroaches, dust mites and mold. When their doctor lifted Ashley's shirt to listen to her lungs, a cockroach fell and scooted across the examining table.*

In another study, children living in an urban area were 4.4 times more likely to have cockroach allergen in their bedroom than children from suburban areas, and poor children were 4.2 times more likely to be exposed to cockroaches at home than the nonpoor.[18]

Another researcher found that cockroach sensitization was a significant risk factor for asthma attacks.[19]

Dust Mites, Inadequate Heating

Children with asthma are also put at risk for more severe disease by other factors associated with inadequate housing, including dust mites found in old carpeting. The common dust mite has been implicated as a cause for the worldwide increase in this deadly disease.[20]

As many as one in four children in poor housing have inadequate heat or hot water[16]—other factors linking poor housing with asthma attacks.[21]

Expensive housing, more asthma

Costly housing can increase rates of asthma attacks in two ways. First, when families move in together to share expenses, the resulting crowding can increase the number of respiratory infections and reduce air quality. Indeed, both a large family and small living space have been independently associated with more asthma.[22]

Second, more money spent for rent can reduce available funds for asthma treatment. Families of children with asthma can spend from 2–30% of their income on necessary medications.[21]

Infectious Disease

In addition to asthma, poor housing and crowding can lead to increased rates of infection with such respiratory viruses as the Respiratory Syncytial Virus. Infection with this virus can threaten the life of former premature babies[23] and can predispose other children to asthma.[24] Water damage to run–down housing also sets the stage for *stachybotroys atra*, a fungus whose toxin has been linked to fatal hemorrhage in the lungs of infants.[25]

For all these reasons—cockroaches, mold, dust, infections, and overcrowding—inadequate housing can literally take a child's breath away.

CONSEQUENCE #2: INJURIES

At a routine physical exam, the doctor noticed extensive, well healed burn marks on both of Donald's legs. Donald's family had been living in an unfurnished room in a dilapidated house in North Philadelphia, many of the other tenants being crack addicts. There were no beds, no kitchen to cook in and Donald had been sleeping on the floor when the hot plate his mother was cooking with fell on him. He suffered third degree burns and needed to be admitted to the hospital.

But Donald's admission to the hospital had treated more than his burns. A social worker visited the home and declared it unfit for children. Donald and his family were placed on the waiting list for Section 8 housing. After several years, they received the subsidy and were able to move to a small row house. Donald and his family now have a kitchen, a yard and a safe neighborhood, luxuries they have not known for many years.

Accidents, like the one that happened to Donald, are the leading cause of death among children 1 to 14 years of age.[26] Though accidents associated with motor vehicles are the most common, forms of accidents associated with housing (falls, burns, drownings and fires put together) are almost equal to that number. Such accidents associated with problems in housing result in over 5,000 deaths annually, and over 1.4 million injuries each year. Considering burns and fires alone, over 54,000 Americans are admitted to the hospital, and an estimated lifetime cost from fire and burn injuries from one year has been as high as $3.8 billion.[27]

Burns

Two ways that burns can be associated with housing conditions is tap water temperatures and home heating burns. It has long been established that hot water heater temperature settings have been associated with increased incidence and severity of burns.[26]

Yet, in one study, over 98% of poor families did not know what temperature their hot water should be to prevent burns[28] and many poor families have no way of easily knowing or controlling their hot water settings in their apartments.

Reports of home heating burns are extremely common, either from wood stoves, kerosene heaters, floor furnaces or exposed home radiators, and these burns can cause serious life–long injury. In 1993, approximately 1800 children visited emergency rooms for burns related to nonvehicle radiators alone.[29]

In a study conducted in Chicago between 1991–1994 it was shown that a majority of radiator burns were caused by uncovered radiators in an inner–city housing development.[29] In all buildings where the affected children lived, there were steam radiator systems, with temperatures from 180° F– 230° F and in buildings where more than one burned child lived, 79% were missing radiator covers, insulation over radiator pipes or both. Many children slept in beds too close to radiators due to over–crowding, and one child suffered a burn while waiting for repairs in the radiator to be made.

In Chicago, steam radiators are very common in older buildings, and there are no regulations requiring covering of radiators in private or public housing. For many poor parents, options to move are unavailable and many of our stories show their children at danger for severe, and sometimes repeated, burns.

Fires

Fires are the third leading cause of death among children under the age of 14, after motor vehicle accidents and drownings. About three–quarters of deaths from fires are from house fires, some 2000 deaths a year just in children 15 years and under, with the largest group of these children under the age of four. Poor families are at particular risk from fires, whether from higher- risk faulty heating systems or from the use of woodstoves or kerosene heat (when oil or gas is too expensive).[28]

It has been shown that simple smoke detector use can decrease the risk of dying in a fire substantially, but despite smoke detectors being required by law, about one third of households had no smoke detectors in one survey.[28]

In a study done in New Mexico, death by fire was strongly associated with the type of home.[30] Mobile homes had three times the mortality rate from fires than that of standard homes or apartments, and homes without plumbing carried more than ten times the fatality risk. Since 82% of children who died from fire expired at the scene, it was recommended that the best intervention to prevent these deaths was to improve housing conditions, not better burn units.

***Laura**, an 8–year–old girl, lived with her mother and 3–year old brother until they were evicted from their unsubsidized apartment. The family reluctantly moved in with relatives while they waited for housing assistance. During this time, Laura was physically abused by a relative, and the Department of Social Services placed her in a foster home.*

Violence

Due to the unaffordability of housing, many poor children are trapped in unsafe neighborhoods or living arrangements. In a study done in Washington, DC, 45% of first and second graders had witnessed a mugging, 47% had seen a shooting, 31% had seen a stabbing and 39% had seen a dead body.[31]

In a survey done at Boston City Hospital, 10% of children in the primary care clinic had witnessed a stabbing or shooting by age 6, half occurring within their own home and half on their street.[32] This exposure to violence can have long term effects, including post traumatic stress disorder, psychotic episodes, and suicidality.[33]

Violence at home is an equal threat. One of the many ways batterers control women is financially. Facing the shelter system—which exposes children to health and social risks— many mothers stay in violent relationships. While the long term consequences of child abuse are well–known, recent evidence has shown that witnessing violence at home may cause children to have many of the same terrible psychological and developmental problems.[31]

CONSEQUENCE #3: LEAD POISONING

I am taking care of a child with a lead level of 60, well above the toxic range, whose house had multiple lead violations. The landlord refused to clean the lead from the house, so the city health department had to intervene. Following de–leading, the landlord reportedly harassed this tenant by not providing heat and by pouring water from her second floor apartment until water leaked into the child's apartment. The mother was referred to tenant rights groups but decided not to fight. Instead, the family moved out to a homeless shelter.

Lead poisoning has long been recognized as a threat to children's health. As early as ancient Greek times, it was known that ingesting large amounts of lead caused severe abdominal pain and even seizures. The relationship of housing conditions to lead poisoning also dates back more than a century. As early as 1894, cases of childhood lead poisoning were being attributed to children eating lead paint off the porches in Brisbane, Australia.[34] It has also been known for many years that children absorb more lead after ingestion than adults.

Lead damages many different parts of the human body. Sudden poisoning can cause abdominal pain, constipation, fatigue, anemia, nerve damage, and altered brain function, which can even lead to coma and seizures.[35] Long–term exposure can harm the blood, the brain, the kidneys, and the reproductive organs.

Of special concern in children are the long term effects of lead on the developing brain. Researchers have noted that children with high levels of lead in the umbilical cord had lower mental development scores and problems with fine motor and interactional/linguistic skills.[36]

It has been estimated that even at lead levels as low as 10–20, much below levels that were previously thought to be dangerous, there is about a 2.5 point drop in IQ for each increase of 10 in blood lead level.[37]

Even in children who appear otherwise healthy, teachers rate children with higher lead levels as having poorer speech and language processing, disordered classroom behavior, more daydreaming, and an inability to follow directions.[38]

Another study found that children with increased lead levels in their teeth were seven times more likely to drop out of high school and over 5 times more likely to have a reading disability.[39]

The Housing–Lead Connection

Housing conditions are the most frequent cause of childhood lead poisoning. Most commonly, children ingest lead from lead–containing paint, mostly in older, often deteriorating housing stock.[40] Besides paint, lead in the soil and water around houses are other possible sources of exposure.[41]

According to NHANES III, a national study looking at many different aspects of Americans health (1991–1994), lead levels are highest in children living in housing built before 1946, and higher if housing was built between 1946 and 1973 compared to after 1973. This study found that *5.9% of all U.S. children age 1–2 have blood lead levels greater than 10,* placing them at risk. The CDC estimated that about 1 million U.S. children between one and five years have elevated blood lead levels.[40]

Living in older housing may place children more at risk because lead is now banned from household paint, plumbing systems and food and drink cans (as well as gasoline). In a random telephone survey of children across the country, children under the age of 6 were more likely to have an elevated lead level if they lived in housing built before 1960, in a rental home, in the northeast, or with low household income.[42]

An estimated *14 million U.S. children* in the at–risk age of 0–6 years old still live in housing built before 1960 with the highest concentration of lead paint. Poor and minority children are more likely to face increased risk, but in absolute terms, the majority of at risk children are white.[40]

My daughter was lead poisoned because nobody told us our house built in 1906 had lead paint. We had to move from there when we found out what was going on, and I believe my child's development is still being affected.

—a mother from rural Missouri

Lead and the Law

Some legal changes have been responsible for a significant decline in lead exposure over the last 25 years.[40] By the mid 1980s, the EPA had eliminated lead from gasoline, the Occupational Safety and Health Administration had lowered acceptable lead levels in the workplace by 75 percent, the Consumer Product Safety Commission had limited lead in paint to 0.06 percent, and lead solder in water pipes had been banned.[43]

However, the legal approach has had less success in reducing the risk of lead poisoning from poor housing. As early as 1961, Baltimore passed a program to remove lead from homes, controversy developed over whether the cost of removal was excessive.[43] For many years afterwards, laws on lead in housing have remained largely regional and scarcely effective.

In 1992, Congress passed the Residential Lead–Base Paint Hazard Reduction Act (Title X), legislation that required sellers to tell buyers of lead hazards prior to purchase. Still, only an estimated 9.1 percent of pre–1960 homes have been tested for lead.[42]

Lead removal legislation can be found in Massachusetts, where the Massachusetts Lead Law requires the institution of strict control measures or removal of lead paint from all homes built before 1978 when children younger than six move in.[44] The city of Boston also offers grants and low–interest loans to assist landlords with paying for lead removal, but many landlords fear the cost, which can exceed annual rent for some tenants.

As a result, discrimination against families with children can prevent families from finding safe housing for their children. Newer, lead–free apartments are often too expensive for poor families. Many parents have no choice but to live in homeless shelters or put their children at risk for permanent brain damage.

CONSEQUENCE #4: HOMELESSNESS

***Carrie**, an 8 year old girl, came to the medical care van for homeless people and asked to be alone with a doctor. She was covered in a rash, most likely from not bathing for weeks because the building where she and her parents were "squatting" had no running water. Her teeth were rotting because one of*

her main source of calories were the sugar packets and jams her parents filched from a restaurant in Harvard Square. She did not have soap or shampoo, a toothbrush or toothpaste, a doctor or dentist to follow–up with and she hadn't been to school in weeks.

Carrie's story is all too typical of the overwhelming problems homeless children face every day. The General Accounting Office estimated in 1989 that 41,000 to 107,000 children are literally homeless on any given day, with 39,000 to 296,000 more in "doubled up" or shared housing.[4]

While most of the information on children and the effects of homelessness are related to shelters because they are the only accessible population, many others live in cars or "doubled up" with friends or family. Some studies have suggested that residential instability, either from homelessness or other housing problems put these children at twice the risk to becoming homeless adults, perpetuating the cycle. [45]

While nearly 70% of homeless families in shelters are only there for 3 months or less, one in four families are homeless from 3 months to 3 years.[46] While long periods of homelessness can be more detrimental to a child's health, any length of homelessness can be associated with many short term and long term effects:

Infections

Children who are homeless are at significantly increased risk of infections compared other children, even housed poor children.[47] In one study, homeless children had a 42% chance of having an upper respiratory infection over a given period of time, compared to 22% for the general population of children.[48] Multiple respiratory and ear infections can lead to hearing problems, language delays and even poor school performance. Other contagious infections, such as diarrhea, have been shown to be more 5 times more frequent in children in shelters than compared to other children in the same area.[47]

Homeless children can even contract more serious infections like tuberculosis, a lung infection which requires months of expensive medicines and can affect the entire body if it goes untreated. In addition, children in shelters have high rates of such breathing problems as asthma.[47]

Nutrition

Homeless families often want for food. One study documented that 21% of children in shelters felt they did not get enough to eat in the last 4 days or more of every month because of lack of money.[47]

This lack of food can have long term effects, especially iron deficiency anemia, a disease that is associated with behavioral problems and decreased cognitive development. Homeless children are 7 times more likely to be iron deficient than housed children.[49]

Psychological Issues

Perhaps the most disturbing of the effects homelessness has on children are the delays in their development, like walking, talking and playing. One study demonstrated that only 5% of children entering shelters had a developmental delay, requiring specialist evaluation, similar to 7% of poor, housed children.[50] However, in one study, half of children in homeless shelters had one or more developmental delays.[51]

***Judy**, a 1 year old girl, was forced into a homeless shelter because her grandmother's house had lead paint. She was admitted to the hospital several times in her first year for respiratory infections. While her mother was committed to follow–up with Judy's regular doctor, she needed to travel over 90 minutes from the shelter to get to her doctor's office.*

Similarly, 45% of school age children in homeless shelters were found to need special education evaluation, yet only 22% actually received this important testing or placement.[52] Moreover, about half of children in shelters missed one week of school in 3 months and 20% missed over 3 weeks in three months, significantly more than poor housed children.[47] Children who change shelters often must change schools too, disrupting continuity in learning.

The psychological health of children can also be devastated by homelessness. Half of all children in shelters show signs of anxiety and depression. [53] When compared to poor, housed children, homeless children show significant behavioral disturbances, like tantrums and aggressive behavior.[47]

Lack of Routine Health Care

Since the very word homelessness implies transiency, it makes sense that many homeless children lack a regular place for health care. This has many results, the most frightening of which is lack of immunizations against such deadly diseases such as polio, whooping cough, and meningitis. Children in shelters have shown as high as a 70% rate of delay in immunizations in comparison to 22% among poor, housed children.[49]

Many homeless families are unable to visit or even identify a regular clinic. In some homeless shelters, over 44% of families use the ER or clinics in hospitals as their only care.[54]

Injuries

One of the preventable problems in children are injuries. In one survey of homeless mothers, 20% responded that their child needed to be seen at an ER for an injury or fall.[54] Six percent of children reported either a fracture or a fall (being "knocked unconscious") and 14% report having a burn serious enough for a scar to form. These injuries put homeless children at needless endangerment of life and limb.

CONSEQUENCE #5: MALNUTRITION

Ruby's *mother brought her to Children's Hospital Boston this spring because she was unable to walk at almost two years of age. Doctors noticed chipped teeth and unusual bumps near her joints. After extensive evaluation, Ruby was diagnosed with severe rickets (also known as Vitamin D deficiency), a devastating and rare bone disease that is prevented by simple exposure to sunlight. However, Ruby had spent the first eight months of her life inside a homeless shelter, her mother unwilling to leave for fear of violence.*

While rickets may be a relatively rare event,[55] Ruby's story illustrates a common connection between inadequate housing and childhood malnutrition. Even when children receive adequate sunlight, they frequently do not get enough food when their parents must spend a large proportion of their income on rent.

Evidence for this tradeoff comes from a 1992 government survey, which demonstrated that families receiving rent assistance paid approximately 30 percent of their income for rent.[56] However, poor families who were eligible but not receiving housing assistance (such as those on a waiting list) paid over 40 percent for rent—and spent less of their income on food.

Frighteningly, additional evidence reveals that families receiving welfare benefits in cities like Boston can easily spend more than 75% of their income for rent.[57]

The tradeoff between food and housing expenses is particularly acute during wintertime months. In a recent study, researchers at Boston City Hospital analyzed data on over 11,000 children between 6 months and 2 years of age and found that growth was decreased in the three months following the coldest months of the year.

The researchers also found that "families who were without heat or were threatened with utility turnoff in the previous winter were twice as likely as other families to report that their children were hungry or at risk for hunger."[58]

Even among poor families, housing subsidies may prevent malnutrition by allowing families to spend more of their small income for food. A 1995 study compared the rate of malnutrition among poor children whose families already received subsidized housing with the rate among children of families on the waiting list.[59]

The results were dramatic: Almost *one in five* children on the housing waiting list had indicators of stunted growth, compared to about *one in thirty* children who lived in subsidized housing. The authors noted that "the biologic consequences of poor growth for children may include a negative influence on future school performance."

Subsidized housing has also been linked to a lower rate of iron–deficiency anemia—a disorder that is associated with behavioral problems and decreased cognitive development. Children who do not receive housing assistance are 50% more likely to be iron deficient than children of families receiving housing subsidy.[60]

III. Double Trouble: Chronic Disease and Inadequate Housing

Martin is an active 13 year old boy who had been controlling his severe cystic fibrosis—a disease which causes serious lung disease and malnutrition—with only yearly visits to the hospital. But his mother's salary could not cover their rising rent, and their landlord threatened eviction. Over the next 6 weeks, worrying constantly about where he would live, Martin was hospitalized twice for severe pneumonia and lost over 10 pounds.

Inadequate housing threatens the health of all children, but it only significantly harms the health of some. When children have a chronic disease, they live in a precarious balance between sickness and health.

All of the previously described consequences of poor housing even more dramatically affect children with chronic disease.

Lionel, an active, nintendo–loving seven–year–old boy, was diagnosed by doctors at Boston Medical Center last month with a life–threatening cancer of the blood. His two–year treatment regimen at the Dana–Farber Cancer Institute will devastate his immune system, leading doctors to provide free dental care now just to reduce the chance of a mouth infection later. Yet doctors cannot alter one of Lionel's most dangerous risks for infection: the rodents that infest his cramped unsubsidized apartment.

- **Respiratory disease.** In similar housing conditions, preterm infants were found to be more susceptible to the ill effects of overcrowding—such as pneumonia—than full term babies.[61]
- **Infection.** What for healthy children may be an everyday infection can threaten the life of a child with a compromised immune system.
- **Financial catastrophe.** Many parents lose income while taking care of a chronically ill child—not only because of the expense of treatment, but also in terms of work time lost. Combined with the financial stress of unsubsidized housing, this burden can prove overwhelming.

A survivor of multiple intestinal surgeries, Julia remained a playful four–year–old despite relying on a machine connected to one of her veins for all her nutrition. But one day this food supply was cut off: Julia's mother could not afford to pay for her electricity and the high cost of her unsubsidized rent.

- **Lead poisoning.** Chronically ill children suffer more severe lead poisoning than otherwise healthy children.[62]

For many children, chronic disease is a nightmare of hospitalizations, difficult medical treatments, and intermittent schooling. When housing conditions are not adequate, this nightmare can become horrific.

IV. Statistics: The Impact of Inadequate Housing on Child Health

After reviewing the individual stories received by our project as well as dozens of articles from the medical literature, we estimated the cumulative impact of inadequate housing on child health in the United States. Unfortunately, because of the lack of large data sets, we have had to extrapolate from smaller studies in some cases. Using data from different sources, with methodology presented in the footnotes, we present our conclusions below. At every opportunity, we have tried to be conservative in our estimates.

Estimates of the Cumulative Impact of Inadequate Housing on Child Health

Asthma:	
• Hospitalizations per year for asthma among inner–city children ages 4–9 attributable to cockroach infestation:[63]	9,995*
*revised statistic from original report	
Injuries	
• Burns to children from exposed radiators per year[64]	1,485
• Child deaths per year due to fires potentially attributable to electrical and heating problems in poor households[65]	187
Lead Poisoning	
• Approximate number of IQ points that will be lost to lead poisoning among children ages 1–5 in the United States.[66]	2.5 million
Malnutrition	
• Children ages 0 to 3 years with stunted growth attributable to their families being on the waiting list for housing assistance[67]	21,392
• Children ages 6 months to 6 years with iron deficiency anemia attributable to their families not receiving housing assistance[68]	120,202
Homelessness	
• Children homeless each night, with increased risk of violence, psychological disturbances, infections, poor vaccination, poor school performance[69]	41,000 to 107,000

V. RECOMMENDATIONS FOR ACTION

General Recommendations

- Quality housing should be considered a child health issue. As such, affordable and adequate housing through public housing units and certificates should be guaranteed to poor children and their families. *The Section 8 housing voucher program should be significantly expanded to allow parents to find safe and affordable housing for their families.*
- *Vouchers should be targeted to the most poor families, who have the most to lose from inadequate housing and the most to gain from control over their environment.*
- Proposed changes in housing developments and programs should be evaluated in part based on their likely effects on children's health. *Contracts should consider not just cost but the implications of building materials for asthma, injuries, and lead poisoning.*
- Tenants should have full access to legal aid to be able to obtain what is often their legal right—housing that is free of lead, free of infestation, and free of causes of severe asthma and allergies. *Federal, state and local governments should fund legal aid programs to help parents fight for their legal right to a safe home for their children.*
- Public housing developments should take the lead by assessing the health needs of their families around such areas as asthma prevention, injuries and lead poisoning. *Health care institutions, which often have significant resources, should collaborate with public housing organizations to identify the health needs of their families.*
- Housing authorities should be more responsive to children whose health is compromised by poor housing—a "fast track" approach to qualifying for public housing assistance. *Each housing authority should have a medical review board to prioritize qualified families.*

Asthma

- Government agencies that inspect housing for adequacy should also be able to assess asthma risk factors and respond quickly when the child's health is threatened. *An asthma intervention team should be developed by cities and hospitals to quickly reduce the risks of very hazardous living situations.*
- Medical insurance should pay for asthma–related cleanup of inadequate housing. *At a minimum, all insurance programs should cover bed and sheet covers, and periodic anti-pest, anti-mold, and dust-mite treatment.*

Lead Poisoning

- Significant public financing is needed to insure that homes and apartments with young children are made safe quickly and efficiently. *It is unacceptable, as has been recently reported, that poor families have been ordered to spend thousands of dollars they do not have to keep their children from being poisoned.*

Injuries and Violence

- Medical insurance should pay for radiator covers, fire alarms, and window guards. *Landlords who maintain apartments with risk to children should be prosecuted to the full extent of the law.*

Malnutrition

- Fuel assistance during winter months should be guaranteed to poor families to reduce the tradeoff between “heat” and “eat.”
- Food stamp allotment should be increased during winter months in cold areas.

Homelessness

- Homelessness is not compatible with a safe and nurturing childhood. The United States should endeavor to end this threat to children by significantly expanding housing access. All homeless families should immediately qualify for housing assistance with the goal of placement within one month.
- Homeless shelters for families must meet basic standards for the protection of child physical and mental health: privacy, quiet for homework and sleep, food to meet growing nutritional needs, and protection from environmental hazards.
- All states and localities with homeless populations should develop a program of intensive case management by nurses of homeless children. *This case management should include a medical passport for each child, developmental assessment, advocacy for housing, and advocacy for continuity in school.*

VI. NOTES

[1]. "Indicator 12. Housing Condition of Children." U.S. Department of Housing and Urban Development, Office of Policy Development and Research, American Housing Survey, unpublished data. http://inet.ed.gov/pubs/youthindicators/indtab12.html

[2]. NLIHC Background on Housing Issues. National Low-Income Housing Coalition, Washington, D.C. http://www.nlihc.org/backgrd1.htm#needs.

[3]. Lazere EB, Center on Budget and Policy Priorities. *In Short Supply: The Growing Affordable Housing Gap*. Washington DC, July 1995.

[4]. Lewit EM, Baker LS. Homeless families and children. *The Future of Children* 1996;6:151.

[5]. Drier P and Atlas J. Housing Policy's Moment of Truth. *American Prospect* 1995;22:68-77.

[6]. Jencks C. Half-right on public housing. *New York Times*. 20 May 1997: A23.

[7]. National Low-income Housing Coalition. *Housing America's Future, Children at Risk.* NLIHC: Washington, 1994, 27.

[8]. HUD's Housing Emergency. *Boston Globe*. Editorial. 18 February 1997.

[9]. In the right direction on housing. *Boston Globe*. Editorial. 21 June 1997: A14.

[10]. Wissow LS, Gittelsohn AM, Szklo M, Starfield B, Mussman M. Poverty, race and hospitalization for childhood asthma. *Am J Public Health* 1988;78:777-782.

[11]. Newacheck PW, Budetti PP, Halfon N. Trends in activity-limiting chronic conditions among children. *Am J Public Health* 1986;76:178-184.

[12]. Mak H, Johnston P, Abbey H, Talamo RC. Prevalence of asthma and health service utilization of asthmatic children in an inner city. *J Allergy Clinic Immunol* 1982;70:367-372.

[13]. Asthma--United States, 1980-1987. *MMWR* 1990;39:493-497.

[14]. Weiss KB, Gergen PJ, Crain EF. Inner-city Asthma: The epidemiology of an emerging US public health concern. *Chest* 1992; 101S:362-367.

[15]. Sly RM. Mortality for asthma 1979-1984. *J Allergy Clinic Immunol* 1988; 82:705-717.

[16]. Bhat BR, Friendman S, Adimoolam S, et al. Study of social, education, environmental and cultural aspects of childhood asthma in clinic and private patients in the city of New York. *Ann Allergy* 1978;41:89-92.

[17]. Rosenstreich DL, Eggleston P, Kattan M, et al. The role of cockroach allergy and exposure to cockroach allergen in causing morbilidty among inner-city children with asthma. *New England Journal of Medicine* 1997;336:1356-63.

[18]. Sarpong, SB, Hamilton RG, Eggleston PA, Adkinson NF. Socioeconomic status and race as risk factors for cockroach exposure and sensitization in children with asthma. *J Allergy Clinic Immunol* 1996;97:1393-1401.

[19]. Gelber LE, Seltzer LH, Bouzoukis JK, Pollart SM, Chapman MD, Platt-Mills TAE. Sensitization and exposure to indoor allergens as risk factors for asthma among patients presenting to hospital. *Am Rev Respir Dis* 1993;174:573-8.

[20]. Platts-Mills TA, Ward GW, Sparik R, et al. Epidemiology of the relationship between exposure to indoor allergens and asthma. *Int Arch All Appl Immunol* 1991;94:339-45.

[21]. Evans R. Asthma among minority children: a growing problem. *Chest* 1992; 101S: 368-371.

[22]. Weitzman M, Gortmaker S, Sobol A. Racial, social and environmental risks for childhood asthma. *Am J Dis Child* 1990;144:1189-1194.

[23]. Groothuis JR, Gutierrez KM and Lauer BA. Respiratory syncytial virus infection in children with bronchopulmonary dysplasia. *Pediatrics* 82(1988):199-203.

[24]. Sly PD, Hibbert ME. Childhood asthma following hsopitalization with acute viral bronchiolitis in infancy. *Pediatr Pulmonol* 1989;7:153-158.

[25]. Richards CA. Toxic fungus suspected in death of three children in Cleveland. *Infectious Diseases in Children.* March 1997:6.

[26]. Rudolph, AM, et al: *Pediatrics*, ed 18. Norwalk, CT, Appleton & Lange, 1987, 706.

[27]. Baker SP, O'Neill B, Ginsburg MJ, et al: *The Injury Fact book*, ed 2. Oxford, Oxford University Press, 1992.

[28]. Shaw KN, McCormack MC, Kustra SL, et al: Correlates of reported smoke detector usage in an inner-city population: Participants in a smoke detector give-away program. *Am J Public Health* 1988;78:650-653.
[29]. CDC. Home Radiator Burns Among Inner-City Children--Chicago, September 1991–April 1994. *MMWR* 1996;45:814-815.
[30]. Parker DJ, Sklar DP, Tandberg D, et al: Fire fatalities among New Mexico children. *Annals of Emergency Medicine* 1993;22:517-22.
[31]. Augustyn M, Parker S, McAlister, Groves B, Zuckerman B. Silent victims: Children who witness violence. *Contemporary Pediatrics* 1995;12:35-57.
[32]. Taylor L, Zuckerman B, Harik V. Groves BM. Witnessing Violence by young children and their mothers. *Developmental and Behavioral Pediatrics* 1994;15:120-123.
[33]. Famularo R, Fenton T, Kinscherff R, Augustyn M. Psychiatric comorbidity in childhood post traumatic stress disorder. *Child Abuse & Neglect* 1996;20:953-961.
[34]. Needleman, HL. The current status of childhood low-level lead toxicity. *Neurotoxicology* 1993;14:161-166.
[35]. Landrigan PJ, Todd AC, Wedeen RP. Lead poisoning. *The Mount Sinai Journal of Medicine* 1995;68:360-364.
[36]. Bellinger D, Leviton A, Needleman HL, Waternaux C, Rabinowitz M. Low level lead exposure and infant development in the first year. *Neurobehavioral Toxicology and Teratology* 1986;8:151-161.
[37]. Rosen JF. Adverse health effects of lead at low exposure levels: trends in the management of childhood lead poisoning. *Toxicology* 1995;97:11-17.
[38]. Feldman RG and RF White. Lead neurotoxicity and disorders of learning. *Journal of Child Neurology* 1992;7:354-359.
[39]. Needleman HL, Schell A, Bellinger D, Leviton A, Allred EN. The long term effects of exposure to low doses of lead in childhood: An 11 year followup report. *New Engl J Med* 1990;322:83-88.
[40]. CDC. Update: Blood lead levels-United States, 1991-1994. *MMWR* 1997;46:141-146.
[41]. Lampherar BP, Weitzman M, Winter NL, Eberly S, Yakir B, Tanner M, Emond M, Matte T. Lead contaminated house dust and urban children's blood lead levels. *American Journal fo Public Health* 1996;86:1416-1421.
[42]. Binder S, Tatte TD, Kresnow M, Houston B and Sacks JJ. Lead testing of children and homes: Results of a national survey. *Public Health Reports.* 1996;111:342-346.
[43]. Berney, B. Round and round it goes: the epidemiology of childhood lead poisoning, 1950-1990. The *Millbank Quarterly* 1993;71:3-39.
[44]. Chiu, A. City urges public housing to rid homes of lead paint. *The Boston Sunday Globe*. 20 July 1997: B2.
[45]. Koegel P, Melamid E, Burnam MA. Childhood risk factors for homelessness among homeless adults. *Am J Public Health* 1995;85:1642-49.
[46]. U.S. Dept of Housing and Urban Development. 1988 National Survey of Shelters for the Homeless. Washington, DC: US Department of HUD, March 1989.
[47]. Wood DL, Valdez RB, Hayashi T et al. Health of Homeless Children and Housed Poor Children. *Pediatrics* 1990;86:858.
[48]. Rafferty Y, Shinn M. The Impact of Homelessness on Children. *Am Psychologist* 1991(November):1170-1179.
[49]. Fierman AH, Dreyer BP, Acker PJ, Legano L. Status of Immunization and Iron Nutrition in New York City Homeless Children. *Clinical Pediatrics* 1993(March): 151-155.
[50]. Lewis MR, Meyers AF. The Growth and Development Status of Homeless Children entering shelters in Boston. *Public Health Reports* 1989;104:247-250.
[51]. Bassuk El, Rubin L, Lauriat AS. Characteristics of sheltered homeless families. *American Journal of Public Health* 1986;76:1097-1101.
[52]. Zima BT, Bussing R, Forness SR, Benjamin B. Sheltered Homeless Children: Their eligibility and unmet need for special education evaluations. *American Journal of Public Health* 1997;87:236-240.

[53]. Bassuk EL, Rosenberg L. Psychosocial characteristics of homeless children and children with homes. *Pediatrics* 1990;85:257-261.

[54]. Parker RM, Rescorla LA, Finkelstein JA, Barnes N, Holmes JH, Stolley PD. A survey of the health of homeless children in Philadelphia shelters. *Am J Child Dis* 1991;145:520-526.

[55]. Sills IN, Skuza KA, Horlick MN, Schwartz MS, Rapaport R. Vitamin D deficiency rickets: reports of its demise are exaggerated. *Clinical Pediatrics* 1994:491-493.

[56]. Consumer Expenditure Survey: Quarterly Data from the Interview Survey. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics; 1992. Report 859.

[57]. Weicha JL, Palombo R. Multiple program participation: comparison of nutrition and food assistance program benefits with food costs in Boston, Massachusetts. *Am J Public Health* 1989; 79:591-594.

[58]. Frank DA, Roos N, Meyers A. Seasonal variation in weight-for-age in a pediatric emergency room. *Public Health Reports* 1996;111: 366-371.

[59]. Meyers A, Frank DA, Roos N, et al. Housing subsidies and pediatric undernutrition. *Arch Pediatr Adolesc Med* 1995;149:1079-1084.

[60]. Meyers A, Rubin D, Napoleone M, Nichols K. Public housing subsidies may improve poor children's nutrition. *American Journal of Public Health* 1993;83:115.

[61]. Emond AM, Howat P, Evans JA and Hunt L. The effects of housing on the health of preterm infants. *Paediatric and Perinatal Epidemiology* 1997;11:228-239.

[62]. Shannon M, Graef JW. Lead Intoxication in Children with Pervasive developmental disorders. *Clinical Toxicology* 1996; 34:177-181.

[63]. Because of available data, we could only estimate for the 4-9 age group. This estimate is based upon 1,906,944 poor children ages 4-9 in central cities of the United States [derived linearly from 6,865,000 poor children in central cities ages 0-18 from U.S. Bureau of the Census, Current Population Reports, Series P60-188, *Income, Poverty,and Valuation of Noncash Benefits: 1993*, U.S. Government Printing Office, Washington, DC, 1995] X rate of asthma approximately 10% in inner-city children [Mak H, Johnston P, Abbey H, Talamo RC. Prevalence of asthma and health service utilization of asthmatic children in an inner city. *J Allergy Clinic Immunol* 1982;70:367-372.] X 36% cockroach sensitivity among urban children with asthma X 0.26 extra hospitalizations/year among cockroach sensitive 4-9 year olds with asthma. [Rosenstreich DL, Eggleston P, Kattan M, et al. The role of cockroach allergy and exposure to cockroach allergen in causing morbilidty among inner-city children with asthma. *New England Journal of Medicine* 1997;336:1356-63.] = 17,849 hospitalizations/year attributable to cockroach infestation among poor U.S. children ages 4-9.

[64]. Estimated from 1881 children seen in emergency room for radiator burns in 1993 X 79% rate of missing covers in one investigation = 1,485 burns. [source: CDC. Home Radiator Burns Among Inner-City Children--Chicago, September 1991–April 1994. *MMWR* 1996;45:814-815.]

[65]. Estimated from approximately 5000 deaths/year from fires [Baker SP, O'Neill B, Ginsburg MJ, et al: The Injury Fact Book, ed 2. Oxford, Oxford University Press, 1992:161-167.] X approximately 25% of deaths among children [Injury Fact Book and Mierley MC, Baker SP. Fatal House Fires in an Urban Population. *JAMA* 1983;249: 1466-68] X 15% excess rate of fatal fires from electrical/heating equipment in poor households [Mierley MC, Baker SP. Fatal House Fires in an Urban Population. *JAMA* 1983;249: 1466-68] = 187 deaths/year of children from faulty electrical/heating equipment.

[66]. Estimated from 1 million children ages 1-5 with lead level > 10 [from MMWR. Update: Blood Lead Levels -- United States, 1991-1994. 47(1997): 141-145.] X 2.5 point IQ loss for each 10 points of lead level. [Rosen JF. Adverse health effects of lead at low exposure levels: trends in the management of childhood lead poisoning. *Toxicology* 1995;97:11-17.] While not 100% of lead poisoning in children is due to housing, our estimate is conservative because (1) some experts estimate more significant cognitive deficits from lead poisoning, and (2) many individual children have levels far higher than 10.

[67]. For a conservative estimate, we assume one child per family. Estimated from at least 1.4 million U.S. households in the waiting list for housing subsidies [Lazere EB, Center on Budget and Policy Priorities. In Short Supply: The Growing Affordable Housing Gap. Washington DC, July 1995] X 50% of poor renter households with children [Leonard PA, Dolbeare CN, Lazere EB. A Place to Call Home: The

Crisis in Housing for the Poor. Center on Budget and Policy Priorities. Washington, DC, 1992.] X 16.7% with children ages 0-3 (linear assumption) X 18.3% excess risk of low growth among children ages 0 to 3 in families on waiting list for housing compared to families receiving housing assistance = 21,392 children with stunted growth attributable to families being on the waiting list for housing assistance.

[68]. For a conservative estimate, we assume one child per family with children. Estimated from 7,050,000 low-income renter households not receiving housing subsidies [Lazere EB, Center on Budget and Policy Priorities. In Short Supply: The Growing Affordable Housing Gap. Washington DC, July 1995] X 50% of poor renter households with children [Leonard PA, Dolbeare CN, Lazere EB. A Place to Call Home: The Crisis in Housing for the Poor. Center on Budget and Policy Priorities. Washington, DC, 1992.] X 31% with child between 6 months and six years (linear assumption) X 11% excess rate of iron deficiency among children 6 months to 6 years of age in poor families not receiving housing subsidies compared to those receiving housing subsidies. [Meyers A, Rubin D, Napoleone M, Nichols K. Public housing subsidies may improve poor children's nutrition. *American Journal of Public Health* 1993; 83:115.] = 120,202 children with iron deficient anema attributable to families not receiving housing subsidies.

[69]. See section on homelessness.