

Housing, Neighborhoods, and Children’s Health

Ingrid Gould Ellen and Sherry Glied

Summary

In theory, improving low-income families’ housing and neighborhoods could also improve their children’s health, through any number of mechanisms. For example, less exposure to environmental toxins could prevent diseases such as asthma; a safer, less violent neighborhood could improve health by reducing the chances of injury and death, and by easing the burden of stress; and a more walkable neighborhood with better playgrounds could encourage children to exercise, making them less likely to become obese.

Yet although neighborhood improvement policies generally achieve their immediate goals—investments in playgrounds create playgrounds, for example—Ingrid Gould Ellen and Sherry Glied find that many of these policies don’t show a strong effect on poor children’s health. One problem is that neighborhood improvements may price low-income families out of the very neighborhoods that have been improved, as new amenities draw more affluent families, causing rents and home prices to rise. Policy makers, say Ellen and Glied, should carefully consider how neighborhood improvements may affect affordability, a calculus that is likely to favor policies with clear and substantial benefits for low-income children, such as those that reduce neighborhood violence.

Housing subsidies can help families either cope with rising costs or move to more affluent neighborhoods. Unfortunately, demonstration programs that help families move to better neighborhoods have had only limited effects on children’s health, possibly because such transitions can be stressful. And because subsidies go to relatively few low-income families, the presence of subsidies may itself drive up housing costs, placing an extra burden on the majority of families that don’t receive them. Ellen and Glied suggest that policy makers consider whether granting smaller subsidies to more families would be a more effective way to use these funds.

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Housing and neighborhoods shape many dimensions of children's health. Housing's physical condition affects the risk that children will be injured, especially younger children, who spend much of their time at home. Environmental toxins in a child's home, such as mold or lead paint, can cause diseases and disabilities. Poor housing conditions may also cause family stress and lead to behavioral health problems. Neighborhood characteristics also affect the health of children, especially older children, in several ways. Physical characteristics such as crosswalks, sidewalks, and playgrounds shape whether children can play safely and be active outdoors. The presence or absence of grocery stores, fast food outlets, and health care facilities may affect obesity and use of preventive health care. Social characteristics, including rates of violence and disorder, can affect both children's physical wellbeing and their mental health. Two of the five leading causes of death among children over one year old, injuries and homicide, are closely connected to characteristics of a child's home and neighborhood.¹

Such relationships between a child's physical surroundings and her health have motivated housing and neighborhood policy since at least 1842, when Edwin Chadwick published his pathbreaking *Report on the Sanitary Conditions of the Labouring Population of Great Britain*, which identified a link between poor living conditions and disease. In the 1930s, public health emerged as a central justification for the federal public housing program.² Even today, one of the commonly stated motivations for housing and community development programs is their potential to create healthier environments. For example, the New York State Healthy

Neighborhoods Program aims to reduce the incidence of both physical illness and injury through upgrading housing and the surrounding built environment. Similarly, enhancing residents' health is one of the goals of the Choice Neighborhoods Program, an Obama administration initiative that aims to improve both distressed subsidized housing developments and the neighborhoods surrounding them.

Despite this long history, there is little direct evidence that housing and community development programs actually improve children's health. We know that, in many situations, a child's physical environment affects her health, and public policies can sometimes change the quality of housing and neighborhoods in which children live. But public policies can also have countervailing effects that may break the apparent link between improvements in the environment and improved child health. For example, better-constructed homes and safer, more walkable neighborhoods can lead to higher home prices or rents, making housing less affordable. Further, rent subsidies can potentially bid up rents, burdening families who do not receive subsidies. Finally, increases in the quality and price of housing may also change the composition of neighborhoods, as higher-income families move in and lower-income families are priced out. Such a change may mean that the benefits of housing and neighborhood improvements accrue to a different population than the one initially targeted. The connections between housing and neighborhood policies, affordability, and population characteristics make it difficult to evaluate the effects of policy, and they complicate the relationship between child health and housing and neighborhood policy. With these concerns in mind, our assessment of

the evidence suggests that policy makers should carefully scrutinize both the benefits of regulations to improve quality and how these regulations affect affordability.

In many cases, the costs associated with improved quality may be offset by the value of consequent health benefits. In some cases, however, the effects of diminishing housing affordability on children's health may outweigh the benefits of the improvements themselves. That calculation leads us to prioritize strategies that generate large effects on health, such as policies that enhance neighborhoods' physical safety. It also suggests that strategies that focus on improving affordability through housing subsidies might aim to reach more households with smaller subsidies, rather than providing larger subsidies to a small number of households.

Policy makers should carefully scrutinize both the benefits of regulations to improve quality and how these regulations affect affordability.

We begin this article by discussing the mechanisms through which housing and community development programs may improve both physical and mental health. We then review the evidence on how existing policies and programs shape children's housing and neighborhood environments, and how those environments in turn affect children's health. We next explore what this evidence implies for reforms across a broad range of policies aimed at housing and communities. We consider housing subsidy programs, housing and

building codes, local land use regulations, and the targeting and design of community development and public safety programs.

Finally, we identify critical gaps in knowledge—about both how and why neighborhoods affect children's wellbeing, and about which policies can effectively create healthier local environments.

Mechanisms: How Policies May Improve Health

Housing policies in the United States typically have multiple, sometimes conflicting goals. Policy makers and researchers often quote the Housing Act of 1949, which set out ambitiously to provide "a decent home and a suitable living environment" for every American family.³ This goal sounds simple, but its interpretation is ambiguous, depending on your view of what constitutes a decent home and a suitable living environment. Further, families must be able to pay for these things and still have funds to meet other critical needs.

Housing policies generally have at least four key goals: to improve housing quality, to improve neighborhoods, to reduce housing costs, and to stabilize families' living situations. Many considerations motivate these four goals, but achieving any of them could improve children's health.

Housing policies to improve quality operate through regulations and subsidies. Governments—especially local governments—impose regulations aimed at reducing the likelihood that children will be injured in their homes. Specifically, local housing codes prohibit such deficiencies as broken windows, missing bannisters, and exposed wiring, with an eye to reducing

the prevalence of falls and other accidents. At the federal level, housing programs that subsidize new construction, or rehabilitation of existing structures, require that funds are used to produce housing that meets certain safety standards. Similarly, federal programs that provide subsidies for rent require that rental homes meet certain quality and safety standards.

More recently, housing policies have aimed to improve the indoor environment as well, through reducing exposure to various toxins, such as lead paint or radon, or reducing exposure to allergens like mold. Proponents of green building standards assert that those standards not only reduce energy use but also improve indoor environmental quality and thereby occupants' health. Most states now include some green building attributes in their qualified allocation plans, which outline priorities for allocating Low Income Housing Tax Credits to developments. Many states also offer tax credits to owners of buildings that meet energy and indoor air quality standards (New York enacted the first green building tax credit in 2000). Though these policies aim primarily to conserve energy, proponents often mention enhancing residents' health as well.

Our housing policies also aim to improve the quality of housing by increasing its size or reducing the number of people living in homes of a certain size. For example, local housing codes typically dictate both a minimum size of housing (say, 350 square feet) and a maximum number of people who can live in each room in a home. Born of the Progressive Era, these regulations are designed to minimize crowding and thereby limit the spread of infectious diseases.

The second key goal of housing policy is to ensure "a suitable living environment" for

families. This goal recognizes that because housing is fixed in space, it brings with it not only a bundle of structural characteristics (for example, plumbing, stairwells, and roofs), but also a bundle of neighborhood characteristics, such as institutions, physical conditions, and social networks and norms.⁴ All of these neighborhood features could affect health. With respect to neighborhood institutions and resources, neighborhoods differ most obviously in the quality and presence of doctors and health clinics. Some neighborhoods have poor transportation networks that make it difficult for residents to reach health-care providers. Further, some neighborhoods may lack features that encourage healthy behaviors (such as parks, playgrounds, gyms, and grocery stores with fresh produce), while they are saturated with features that encourage unhealthy behaviors (such as liquor stores).

A neighborhood's physical characteristics may affect health, too. At the extreme, polluting factories and toxic waste sites may lead to ill health, both immediately and by increasing children's chances of contracting certain diseases in the long term. Nearby highways may elevate asthma rates. Other aspects of the physical environment, such as broken streetlights, crumbling sidewalks, poorly maintained playgrounds, and litter-strewn streets with broken glass and other hazards may increase the risk of injury and discourage outdoor activity.⁵ Urban planners also argue that the density, design, and mix of uses in a neighborhood can affect how much people walk and thereby their health.

Finally, neighborhood social environments, which include such factors as noise and violent crime, racial segregation, and the level of poverty and unemployment, may heighten children's stress levels and exacerbate

stress-related disorders.⁶ Violence can threaten children's physical wellbeing directly (and perhaps even through their mothers' exposure during pregnancy). Violent and stressful living environments may also affect mental wellbeing, and drive older children and teens to engage in unhealthy behaviors, such as smoking and drinking. Exposure to such environments may even weaken the immune system.⁷

In 1940, about 45 percent of housing units lacked complete plumbing—that is, hot and cold piped water, a bathtub or shower, and a flush toilet. By 1985, that share had fallen below 1 percent.

Neighborhoods also offer families a set of social networks, which may both give them critical information about doctors and health care and communicate norms about accepted behaviors. For example, children's views on smoking are likely to be strongly shaped by how many people they see smoking around them. Some neighborhoods offer children richer social and support networks than others do, and these richer networks have been shown to be associated with better physical and mental health.

The third key goal of housing policy is to reduce housing costs. Making housing more affordable may improve health through an income effect, by freeing up resources for nutritious food and preventive health care. Reducing housing costs may also reduce family stress, and thereby improve children's

mental health and reduce the incidence of stress-related disorders.

The fourth key goal is to stabilize living situations. Without housing subsidies, low-income families may have to struggle to pay rent, or rely on shelters and the couches and floors of a series of family members and friends. Such families are continually at risk of having to move. High levels of mobility—and housing insecurity more generally—can heighten stress and undermine physical and mental health. Lee Rainwater, in his classic article, "Fear and the House-as-Haven in the Lower Class," highlights the psychological benefits of having a secure and stable home.⁸

Evidence on Housing, Neighborhoods, and Health

Though only a few studies directly assess how housing and neighborhood policies affect health, many researchers have examined the relationships between various aspects of housing and neighborhood conditions and children's health. Below we discuss this evidence, and consider it in the context of changes in the quality and safety of housing and neighborhoods in the United States over the past few decades.

Housing Conditions and Health

Over the years, we have improved the quality of housing in the United States considerably and reduced the incidence of physical deficiencies. Consider that in 1940, about 45 percent of housing units lacked complete plumbing—that is, hot and cold piped water, a bathtub or shower, and a flush toilet. By 1985, that share had fallen below 1 percent. In the mid 1970s, to track more nuanced changes in housing quality, the Census Bureau came up with a set of new questions. The American Housing Survey now

Table 1. Housing Conditions of Households with Children

Housing Conditions	1975	1993	2005	2011
Physically Inadequate				
Percentage of all households	9.1	7.2	6.2	5.9
Percentage of all poor households	24.0	15.7	12.8	11.0
Percentage of all near poor households	13.3	9.1	9.0	7.1
Crowded				
Percentage of all households	10.7	6.3	6.4	7.1
Percentage of all poor households	27.2	15.0	14.5	17.9
Percentage of all near poor households	17.7	9.9	10.7	9.0
Square Footage of Unit per Person				
Average of all households	–	472.9	541.2	545.0
Average of poor households	–	361.8	426.9	415.5
Average of near poor households	–	388.7	418.5	446.8
Total Square Feet				
Average of all households	–	1,775.7	2,034.4	2,064.6
Average of poor households	–	1,326.9	1,551.7	1,578.4
Average of near poor households	–	1,506.9	1,599.1	1,700.5
Rent/Income >0.30				
Percentage of all households	28.5	42.8	52.9	59.0
Percentage of all poor households	67.9	68.9	85.9	87.8
Percentage of all near poor households	27.2	45.2	59.5	67.0
Rent/Income >0.50				
Percentage of all households	11.8	20.2	27.2	30.6
Percentage of all poor households	40.0	45.7	65.8	67.8
Percentage of all near poor households	2.9	11.4	15.6	19.4
Weighted number of households with children (under 18)	32,316,190	35,454,815	38,447,275	37,564,648

Source: American Housing Survey, 1975, 1993, 2005, and 2011.

Notes: 1. Crowding is defined as more than one person per room (excluding bathrooms, halls, and balconies); 2. Rent/income ratios are calculated for all renters by dividing annual gross rent costs by family income; 3. "Poor" is defined as family income at or below the federal poverty line; 4. "Near Poor" is defined as family income between 101% and 200% of the federal poverty line.

queries households about structural deficiencies; breakdowns in plumbing, heating, and electrical systems; and the presence of rodents. The Census Bureau combines these measurements into a summary index that identifies units that fail to meet a standard

of adequacy. The share of units that were deemed severely inadequate was 1.9 percent in 2011, down from approximately 5 percent in 1975.⁹ The proportion is slightly higher in rural communities.¹⁰ Looking at specific questions, the share of occupied units with

holes in their floors fell from 1.7 percent in 1985 to 1 percent in 2011, the share with exposed wiring fell from 2.3 percent to 1.6 percent, and the share with cracks or holes in interior walls fell from 6.3 percent to 4.3 percent.

More directly relevant to this article are the conditions of homes where children live. Table 1 summarizes how housing quality measures have changed for families with children from 1975 to 2011. In 2011, 5.9 percent of families with children lived in homes deemed severely or moderately inadequate, down from 9.1 percent in 1975. Poor children are far more likely to live in inadequate housing than other children; a full 11 percent of poor families with children lived in housing deemed inadequate in 2011, but that share had declined sharply from 1975, when it was 24 percent.¹¹

These standard measures of quality capture physical deficiencies reasonably well, but they fail to capture the presence of toxins and allergens. The share of children exposed to lead-based paint at home has declined substantially. Unfortunately, some homes built before the ban on lead-based paint in 1978 still have such paint, but much of the risk has been remediated. The American Healthy Homes Survey estimated that 35 percent of U.S. homes, mainly in central cities, had any trace of lead paint in their buildings in 2005–06, down from 83 percent in 1990.¹² Homes with young children were no more or less likely to have lead paint. Further, just 22 percent of homes were deemed to have levels of lead-based paint that posed risks. Of the homes with lead-based paint, 93 percent were built before 1978, suggesting that the problem will continue to subside.¹³ Still, many children continue to face risks, especially lower-income

children living in households that are not receiving housing subsidies.

As for exposure to mold and mildew, a special 2011 supplement to the American Housing Survey offers some insight. In that year, 3.5 percent of households in the U.S. reported seeing mold in their housing unit, while nearly 9 percent reported smelling musty smells at least once per week over the past year. Of course, many households may be unaware of mold in their homes. And because we don't have earlier data, we don't know how these figures have changed over time.

During the past few decades, the size of housing units in the United States has increased. The median newly constructed single-family home in the United States grew by 45 percent from 1973 to 2010—swelling from 1,500 square feet to 2,170 square feet.¹⁴ The share of families with children living in crowded conditions (less than one room per person) shrank accordingly, from 10.7 percent in 1975 to 7.1 percent in 2011 (see table 1). Still, nearly a fifth of poor families with children live in housing that would qualify as crowded.

In summary, the data suggest that the size and quality of homes in which children live have improved over time. Children in the United States are living in larger and less crowded homes with fewer physical deficiencies.

Some of this progress has likely translated into improved health. For example, substantial research has shown a connection between elevated blood lead levels and neurological damage in young children, and less lead paint in housing has clearly led to a decline in elevated blood lead levels.

According to the National Health and Nutritional Examination Survey, a population survey administered by the Centers for Disease Control and Prevention (CDC), the share of children aged one to five with blood lead levels of at least 10 micrograms per deciliter, the level the CDC used until 2012 as its threshold of concern, had fallen from 88 percent in the late 1970s (before the ban on lead paint) to less than 1 percent during the 2007–10 survey waves.¹⁵ Research also shows an association between children’s asthma and exposure to allergens, such as dust mites, mold, and cockroaches, though in this case we aren’t sure if children have become less exposed to these risks over time.¹⁶

The evidence concerning the connection between housing’s structural quality and children’s health is relatively thin, with most of it coming from nonexperimental studies, which compare children living in higher and lower quality housing.¹⁷ These studies generally find an association between poor housing quality and poorer health, but because poor-quality housing is also generally cheaper than better-quality housing, we cannot infer that the poor housing quality actually caused the poor health outcomes. That is, families often live in low-quality housing because they are poor, and poverty leaves children with multiple disadvantages, any of which may undermine their health. Still, remedying obvious risks is likely to make a difference. For example, installing relatively inexpensive window bars on apartment buildings in New York City reduced fall-related deaths among children by an estimated 47 percent.¹⁸

The evidence on how housing affects mental health is also generally associational. One recent study followed families over time and found that children whose housing quality worsened were more likely to exhibit

emotional and behavioral problems.¹⁹ But even following the same families over time does not solve the challenge of sorting out the relationship between quality of housing and other issues families face. Children may move to lower-quality housing precisely because their parents experience a loss of resources or wealth.

Despite Progressive Era reformers’ concerns about the health dangers of crowded housing, there is little research evidence showing a causal link between crowding and health problems. Beyond the problem of sorting out causality—that is, whether families living in crowded housing are in poor health because of their low incomes and limited resources rather than because of the housing itself—cultural norms, such as expectations about whether children of opposite sex can share a bedroom, may modify the relationship between crowding and stress. However, a number of studies that have compared children who live in more and less crowded housing show that crowding is associated with worse health. In a pair of studies, for example, Gary Evans and colleagues found that, among children, crowding is associated both with physical signs of stress (such as elevated blood pressure) and with psychological distress (as reported by children and teachers).²⁰ Using the Panel Study of Income Dynamics (a large data set that follows families over time), Claudia Solari and Robert Mare tested how changes in crowding affect changes in parents’ rating of their children’s health. When they examined changes in crowding within the same families, they found a small, marginally statistically significant association between crowding and physical health: even a substantial increase in crowding between one interview and the next was associated with only a very small

reduction in parents' rating of their children's health. Solari and Mare were able to control for families' fixed attributes, such as parental education and race, as well as for changes in income; however, they were not able to control for many other possible changes in family status and resources, such as increases in debt, job changes, residential moves, or shifts in family composition, that might also have affected parents' assessments of their children's health.²¹ These other factors might well have led both to changes in crowding and to the modest changes in ratings of children's health they found to be associated with increases in crowding.

Neighborhood Conditions and Health

Over the years, changes in children's neighborhood environments have not been as

positive as the changes in children's housing conditions. As table 2 shows, the typical child in a metropolitan area in the United States in 2011 lived in a neighborhood with more poor and unemployed residents and more households headed by single women than did the typical child in a U.S. metropolitan area in 1970. On the other hand, the average metropolitan child in 2010 also had considerably more educated neighbors than did the average metropolitan child in 1970.

One clear pattern seen in table 2 is that poor children consistently live in more disadvantaged environments than do other children, and these neighborhood environments may have a distinct effect on their health. Over the past several years, researchers have made considerable strides toward examining these effects through experimental studies,

Table 2. Average Characteristics of Neighborhoods Where Children Live

Neighborhood Conditions	1970	1980	1990	2000	2010
Poverty Rate					
All children	11%	12%	14%	13%	14%
Poor children	–	–	25%	22%	24%
Unemployment Rate					
All children	4%	7%	7%	6%	9%
Poor children	–	–	11%	10%	11%
High School Dropout Rate					
All children	20%	15%	15%	13%	9%
Poor children	–	–	20%	18%	13%
College Graduation Rate					
All children	11%	16%	18%	22%	26%
Poor children	–	–	12%	15%	17%
Percentage of Female-headed Households					
All children	13%	20%	22%	24%	28%
Poor children	–	–	33%	33%	38%

Source: Neighborhood Change Database (NCBD) tract data, 1970–2010.

Notes: Children are defined as individuals below age 18; unemployment is calculated for the age 16-plus civilian labor force; the college graduation rate is the share of individuals over 25 years old with a four-year college degree.

yet concrete associations remain relatively scarce, and the mechanisms through which health effects occur remain unclear, in part because routinely collected data rarely capture the characteristics of neighborhoods that we think may matter most to children's health, such as pollution, traffic, and crime.

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Pollution undoubtedly harms children's health. When researchers have examined variations in air quality caused by regulations, weather, or changes in local pollution-emitting industries to assess the link between air pollution and infant health, they have found that higher levels of carbon monoxide and particulates increase infant mortality.²² Other studies have found that living in a zip code with a hazardous waste site increases the risk of congenital anomalies in infants and significantly increases the rate of children's hospitalizations for asthma and infectious respiratory diseases.²³ And electronic toll booths on highways that reduce both traffic congestion and vehicle emissions appear to reduce the incidence of low birth weight by 11.8 percent and of premature births by 10.8 percent among mothers who live within about a mile of the toll plaza.²⁴

High neighborhood traffic is associated not only with elevated air pollution; it also brings elevated risks to pedestrians. In this context, speed bumps and other traffic control devices are associated with reduced rates of child pedestrian injuries. For example, an evaluation of the Safe Routes to School Program, a government-funded initiative to increase safe walking and bicycling paths to school, found that child pedestrian injuries decreased significantly in neighborhoods where the program was implemented and increased slightly in neighborhoods where it was not.²⁵

Concerns about childhood obesity have spurred research on the extent to which neighborhood design shapes children's physical activity. One common measure of neighborhood design is the walkability score, which uses several measurements to determine how friendly an area is to walking. Several studies find that children and adolescents who live in more walkable areas report more physical activity.²⁶ However, rural children are somewhat more likely than average to be overweight or obese, even though they are more physically active than urban children.²⁷ Clearly, activity levels are only one of the factors that lead to obesity.

Children's health has been linked to a number of other neighborhood features, including the presence of grocery stores and recreational facilities, the availability and quality of schools, and access to doctors and health clinics.²⁸ One thing families in inner cities and in rural areas have in common is that they are less likely to have easy access to healthy groceries.²⁹ Access to groceries may affect children's health, but like most of the work in this area, it is unclear whether these environmental factors actually cause poor health outcomes, or whether sorting and

selection explain the relationships instead.³⁰ For example, children living in more disadvantaged families are more likely to be in poor health to begin with, and disadvantaged families are also more likely to live in neighborhoods with fewer parks, healthy grocery stores, and health clinics.³¹

As for social conditions, studies consistently show that families care a great deal about safety and think about crime and violence when choosing neighborhoods.³² And there is good reason for families to care about crime. Homicide is a leading cause of death among children, and violence imposes spillover costs, too. Research that examines week-by-week changes in violent crimes shows that exposure to violence can profoundly affect how children perform on cognitive tests. Specifically, children living on the same block or across the street from where a violent crime occurred in the previous week scored lower on tests than those living in similarly violent areas in the same neighborhoods but on blocks in which a violent crime occurred during the following week.³³

A few researchers have studied whether racial segregation affects health, and birth outcomes in particular, as a way to explain racial disparities. This research stems from the notion that minorities in more segregated areas may have access to less health information and may live in communities that have suffered from decades of institutional disinvestment and offer fewer health resources. Most such studies examine the link between neighborhood racial composition and the health of that neighborhood's residents, and their results have been inconclusive. There are two problems with examining the links between a neighborhood's racial composition and individual health. On the one hand, this approach may overstate the effects of

segregation, because the more successful members of minority groups may migrate to more integrated neighborhoods. On the other hand, it may understate the effects of segregation, because the degree of segregation in a metropolitan area may influence all minorities there, even those who live in largely white communities.

One of the authors of this article, Ingrid Gould Ellen, sought to overcome these problems by considering segregation at the level of the city and by using a statistical approach to control for the fact that households may sort themselves into different cities by resources and motivation. She found that black mothers are more likely to deliver low birth weight infants when they live in more segregated metropolitan areas, but the birth weights of white mothers' children are not linked to segregation. The mechanisms behind this effect are unclear, but Ellen shows that the more segregated a city, the more likely black mothers are to live in more central, older areas, which may have more deteriorated housing and inferior neighborhood services.³⁴ Another study found that the percentage of blacks in a city is associated with lower birth weights among infants born to unwed black mothers, even after controlling for neighborhood racial composition.³⁵ In some cases, then, a city's overall environment may affect children's health, in addition to conditions in their own neighborhoods.

Nonexperimental studies consistently find associations between children's health and neighborhood characteristics such as traffic safety and walkability, and a few studies designed to test causality show strong links between children's health and exposure to violence, racial segregation, and pollution. But the experimental Moving to Opportunity study offers more ambiguous

lessons about the effects of neighborhood poverty. This experiment, sponsored by the U.S. Department of Housing and Urban Development, was conducted from 1994 to 1998 in five cities: Baltimore, Boston, Chicago, Los Angeles, and New York. In each city, families with children under 18 who lived in public housing in high-poverty areas were randomly assigned to one of three groups. Families in the first group received a housing voucher that could be used only in low-poverty neighborhoods; those in the second group received a housing voucher that they could use anywhere; and those in the third group received no housing voucher but could remain in their current public housing development.

While researchers found that the offer of a voucher to help families move to a low-poverty neighborhood was associated with significant (though modest) reductions in mothers' obesity and diabetes, it did not appear to generate any detectable, long-term effects on children's overall physical health.³⁶ As for mental health, the effects varied with gender and age.³⁷ Girls who moved to lower-poverty neighborhoods exhibited lowered rates of depression and conduct disorder, but boys exhibited higher rates of depression, posttraumatic stress disorder, and conduct disorder.³⁸ Younger children who moved to lower-poverty neighborhoods were less likely to exhibit an increase in behavioral problems than were older children.³⁹

Housing Affordability and Health

Unfortunately, we have made far less progress in making housing more affordable than we have in improving quality. Table 1 shows that the proportion of renter families with children who pay more than 30 percent of their income for housing (the typical threshold used to measure what's called housing

cost burden) rose from 28.5 percent in 1975 to 59 percent in 2011. The share of poor renters with children who were paying more than 30 percent of their income for rent meanwhile rose from 67.9 percent in 1975 to 87.8 percent in 2011. Further, two-thirds of poor renters with children paid more than half of their income toward rent in 2011, up from 40 percent in 1975.

We have made far less progress in making housing more affordable than we have in improving quality.

Though it seems intuitive that high housing costs might undermine health, few researchers have directly explored this connection. As we've suggested, one way that high housing costs might undermine health is by reducing the amount of money that families have available for other critical expenditures that improve health. According to an analysis of the 2012 Consumer Expenditure Survey, severely cost-burdened renters in the bottom quartile of the income distribution spend about \$200 less each month on food and health care than do renters who are not cost-burdened.⁴⁰ Similarly, households that face higher heating costs (because of colder than expected weather) spend less on food.⁴¹ Spending less on food and health care could translate into worse health in both the short and long term. More generally, other research shows that higher incomes improve children's health, holding other factors constant.⁴² Second, the stresses associated with living in unaffordable housing could also undermine health.

Recent research has come to contradictory conclusions. Some studies have found that unaffordable housing and foreclosures are associated with worse health in children and more emergency room visits and hospitalizations; others have found no such effects.⁴³ Of course, to some degree, families can decide how much they will spend on housing, and it's hard to disentangle the impact of housing affordability from that of other factors.

Housing Stability and Health

As we've said, a final goal of housing policy is to stabilize households' and families' living situations. Without housing subsidies, many low-income families move frequently, and many more worry about having to move. In 2005, for example, 55 percent of U.S. children in poor families had moved in the past two years.⁴⁴ Such housing insecurity might heighten stress and thereby undermine both physical and mental health. But few researchers have explored the health effects of such instability. One study finds weak evidence that public housing is associated with better child health, and that one possible mechanism is the greater residential stability that public housing affords.⁴⁵ But the results might also be explained by the lower rents that public housing residents pay. Other research shows associations between residential mobility and behavioral and adjustment problems in adolescents, but it is difficult to know whether the mobility actually caused the behavioral problems, or whether the behavioral problems were caused by the same conditions that also caused the mobility.⁴⁶

The Role of Policy

Public policy has significantly affected the quality of housing and neighborhoods. Many of the gains in housing quality that we have documented in this article came about

because of changes in housing and building regulations. These improvements have the potential to directly benefit children's health. At the same time, however, improvements in housing quality typically lead to increases in housing costs, and these increases may leave families with fewer resources to invest in other health-enhancing goods and services. As we've shown, over the past few decades, families renting their homes have seen large increases in rents and rent burdens. John Quigley and Steven Raphael argue that a large part of this increase comes from increasing regulatory restrictions on new construction.⁴⁷ Though many of these restrictions aim to reduce the density of development, housing codes also regulate the structural quality of housing itself.

Some regulations, such as the 1978 federal lead paint ban and local rules requiring window guards, have led directly to well-documented improvements in both the quality of housing and children's health. Other regulatory efforts focusing on physical deficiencies are also likely to have benefited children's health in ways that outweigh their costs, though the health gains have not been studied or clearly documented. But policy makers should recognize that building and housing regulations increase housing costs, and they should scrutinize such regulations accordingly. This seems especially true in the case of minimum unit and lot sizes. Most cities in the United States impose minimum unit sizes and govern the number of occupants who can live in a housing unit.⁴⁸ Jurisdictions also typically restrict the number of dwelling units that can be constructed on a lot. These regulations might reduce crowding and neighborhood density, but their impact on health is unclear (especially in an era when infectious disease is controlled primarily through immunization).

Meanwhile, such regulations increase housing costs by increasing size and likely by reducing supply as well.

Many of our housing policies provide subsidies to low-income households to lower their costs. Recent experimental research suggests that these subsidies help increase housing quality, keep families from becoming homeless, and reduce housing costs.⁴⁹ But there is little evidence that our housing subsidy programs move families to better and safer neighborhoods.⁵⁰ Further, the Welfare-to-Work Voucher program, the one experimental study that has directly explored how housing subsidies affect children's wellbeing, found no quantitative evidence that the housing choice voucher program had any short-term impacts. Nonetheless, in qualitative interviews conducted as part of the study, parents reported that their increased disposable income was allowing them to spend more money on their children, which might lead to improvements in the long term.⁵¹ It is also possible that the short-term costs of the residential moves required to receive the subsidy may have outweighed any immediate benefits from more affordable and better quality housing, but that over the long term, as children adjusted to their new homes and communities, they would begin to benefit.

While we can question the magnitude of the benefits that our housing mobility programs deliver, their most serious shortcoming is their lack of coverage: only one in four eligible U.S. households actually receives a housing subsidy. Some research even suggests that our largest housing subsidy program, the Housing Choice Voucher program, actually leads to higher rents for the three-quarters of low-income households who do not receive subsidies.⁵² Thus, a critical

question for policy makers is whether spreading the same amount of subsidy dollars across more households would lead to greater or lesser aggregate benefit.⁵³

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Conclusions

Many recent policies involve strategies to help low-income households use their housing subsidies to reach more affluent neighborhoods with greater opportunities. Others strive both to renovate distressed subsidized housing developments and to improve the neighborhoods surrounding them. Policies have generally achieved their immediate goals. Investments in playgrounds create playgrounds; incentives for healthier food bring fresh fruits to poor neighborhoods; building sidewalks makes environments better for walking. The evidence that these changes improve children's health, however, is thin. The results of the Moving to Opportunity demonstration program suggest that the overall impact of neighborhood quality on child health may not be as strong as expected, though this impression may result partly from the difficulties children and teens faced in transitioning to new communities.

Another issue is that improvements to homes and neighborhoods may make housing less affordable. Policy makers should be careful to consider how improvements in housing and neighborhood quality might affect affordability and neighborhood composition. This calculus is likely to favor policies that generate clear and substantial benefits, directly targeting low-income children. One example comes from the recent research showing that exposure to neighborhood violence significantly undermines children's ability to focus and impulse control.⁵⁴ Judging from the evidence, the most reliable way to make neighborhoods healthier may be making them safer.

Subsidies for housing help offset the increased cost generated by improvements in home and neighborhood quality. Our housing subsidy system, however, provides large subsidies to a minority of poor households and leaves others with no subsidy, and perhaps even higher rents. A better approach might be to expand the number of people who receive subsidies while reducing the size of the subsidy available to each family. Though some advocates worry that such shallower subsidies would be too modest to improve living conditions, we have little hard evidence. At the very least, we should experiment with shallower subsidies to test their impacts.

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