

Long-run Effects of Early Life Public Housing Experience: Evidence from Linked Census Data

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Abstract

Programs that improve access to stable high-quality housing also improve health, although our evidence of this relationship is largely limited to short-term effects. We study the long-term effects of the US public housing program on individual health and economic outcomes six decades later. The public housing program began in 1935 and represented a notable achievement in a well-funded and maintained public investment in stable and high-quality housing. We examine effects of early-life public housing exposure on later life health outcomes using a unique dataset of all public housing residents in the 1940 census, linked at the individual level to the 2000 census long form. We identified 101,482 individuals living in public housing in 1940, including 39,093 children. We compare public housing residents in 1940 to a group of 388,000 individuals living in the same or neighboring census districts, matched on the admission criteria for public housing at the time (household income, employment, family structure etc.). We will link these individuals to the 2000 census long form and compare outcomes on educational attainment, functional disability, and homeownership. Our results will identify long-term economic and health impacts of access to a sustained investment in better housing during the critical period of childhood.

Introduction

Early life exposure to adverse social and environmental conditions can have later life effects on health, well-being, and socioeconomic attainment (Elo and Preston 1992; Hayward and Gorman 2004). Socioeconomic gradients in health and well-being can be observed very early in life (Case et al. 2002), and health problems in childhood predict subsequent disparities in educational attainment, adult earnings, and later life outcomes (Case and Paxson 2009). Drawing on evidence of the relationship between early life conditions and later life outcomes, scholars have identified the signature of early life improvements in conditions through exposure to social policy programs, including food stamps, cash transfer programs, and public employment investments (Aizer et al. 2016; Bitler and Figinski 2019; Hoynes et al. 2016; Modrek et al. 2022).

The benefits of stable, affordable, and high-quality housing for short-term health and well-being are well documented. Housing is a platform of stability that allows families to invest in healthy development, and disruptions to stable housing (e.g. evictions) can have lasting impacts (Graetz et al. 2024; Leifheit et al. 2021). Poor quality housing not only increases unhealthy exposures, such as mold, pests, and poor air quality, but can also increase children's risk of injury (Chu et al. 2024; Northridge et al. 2010; Shenassa et al. 2004). Compounding these effects, the widespread shortage of affordable housing—the US housing affordability crisis—constrains housing choice for millions of families (Airgood-Obrycki et al. 2022), forcing many to opt for unstable or low quality housing in order to remain within budget. Evidence indicates that programs that improve access to stable and high-quality housing at an affordable cost can improve outcomes in the short term. Studies find that public housing improves children's stability of housing, physical and mental health, school attendance and academic achievement,

and reduces ER visits (Boudreaux et al. 2020; Fenelon et al. 2021; Gold 2020; Han and Schwartz 2024; Newman and Holupka 2023). **Access to public housing may also improve long run socioeconomic and health outcomes, although data limitations have precluded comprehensive study.**

We study the long-run effects of early life housing improvements on economic and health outcomes using the case of the U.S. public housing program. The modern US public housing program grew out of the New Deal, seeking to both support families harmed by the Great Depression and aid the resurgence of the housing construction industry (Radford 1996). The program began in 1935 with the completion of the *Techwood Homes* in Atlanta, and built high-quality homes for nearly 30,000 households by 1940. Public housing represented a notable achievement as the first large-scale public investment in stable and high-quality housing at an affordable price.

The theory of the public housing program was built on its purported benefits for other realms of life—it grew out of social reformism positing that individuals’ lives could be improved through better conditions of living (Bauer 1934). Public housing represented a substantial improvement in housing quality for most residents. A large fraction of families, including middle-class families, lived in poor housing in need of substantial repair. In 1934, at least 20% of all urban housing units in the US were considered “unfit for habitation” and required major repairs, and 38% of housing units in the 1940 census were substandard (Flores 1994; Hartman and Hook 1956). Housing-related health concerns, including respiratory conditions from poor ventilation, and chronic illnesses due to overcrowding, were prevalent during this period (Lopez 2012). In contrast to contemporary public housing, the program of the 1930s and 1940s was

targeted to the urban middle and working class, was characterized by modern high-quality construction and maintenance, and was operated by well-funded administrative staff (Radford 1996).

We created a unique dataset of all public housing units in the 1940 full count census, and link individuals in these households prospectively to the 2000 census long form to obtain information on outcomes six decades later. We use knowledge of early public housing admission criteria as well as residential location in 1940 to generate two matched comparison groups, who we also link to the 2000 census. We then examine the relationship between public housing residence in childhood and education, income, and functional disability 60 years later.

Data Sources

Public housing participation

There exists no administrative repository of public housing residents from the early days of the program. Furthermore, contemporary population surveys do not collect information on early life participation in housing programs. To obtain information on early life public housing participation, we used the 1940 full count census to identify the universe of public housing units and their residents (Allen and Riper 2020). We used information on public housing projects constructed and at least partially-occupied by 1940 using data from the National Park Service (US Department of the Interior 2004). We identified the location of these housing projects using Sanborn fire insurance maps (Sanborn Map Company 1983), which provided addresses for public housing units. We merged these addresses to the 1940 full count census data from IPUMS (Ruggles et al. 2024). Members of the household associated with the address were identified as residents of public housing.

Public housing units were desirable, and demand to access them was high. In most cities, there were at least 25 applicants for every available unit (Radford 1996). Although information on non-selected applicants is unavailable, we can use location of residence and observable characteristics to identify similar households not in public housing. In addition to public housing residents, we obtain information on two comparison groups: 1) residents of the same and bordering census enumeration districts of public housing developments (*neighbor*), and 2) residents of the same cities as public housing developments (*citywide*). Although the neighbor comparison group shares similar local context with public housing residents, the citywide comparison group may represent the full population from which

Outcome Data

We link individuals from the 1940 census to the 2000 decennial census long form. The long form was sent to roughly 1 in 6 households in 2000, and collected more detailed information than the short form, including data on educational attainment, income, and measures of functional limitations. The long form was discontinued in the 2010 decennial census as it was replaced by the American Community Survey.

Sample

Our sample includes all individuals under age 18 in 1940 who are either living in public housing or members of one of the comparison groups and who are also linked to the 2000 census long form. In 1940, there are 5.6 million children who fit these criteria, including 39,000 in public housing, 113,000 neighbors, and 5.4 million citywide.

Linkage Procedure

We will link records from the 1940 census at the individual level to the 2000 census in the Federal Statistical Research Data Center (FSRDC). The Census Bureau uses available

individual-level identifiers (including Social Security Number, name, and date of birth) and geographic information to assign individuals in a census data product a unique identifier called a Protected Identification Key (PIK). Individuals assigned PIKs can then be linked to their records in other data system in which they have been assigned PIKs. Because PIK largely relies on Social Security Numbers, only about 40% of 1940 census respondents have been assigned PIKs. However, PIK rates for individuals under 18 in 1940 are substantially higher (70-80%) (Massey et al. 2018). As a result, links between child records in 1940 and their adult records in subsequent data systems are surprisingly intact.

Census Bureau research staff demonstrated the linkage of 1940 census respondents to subsequent data systems. 24.6 million 1940 respondents have been linked to the 2000 census, and 4.3 million to the 2000 census long form (Massey et al. 2018). Previous analyses found that 11% of children with PIKs in 1940 appear in the 2000 long form, reflecting some mortality between 1940 and 2000 (Aaronson et al. 2023). Thus, we expect linked samples of 3,200 public housing residents, 9,300 neighbors, and 450,000 citywide.

Selection into Public Housing

Using our two comparison groups (neighbor, citywide) and knowledge of admission criteria for public housing in the 1930s (Bratt 1989; Radford 1996), we will generate matched comparisons to address selection into public housing. Tenant selection guidelines from the US Housing Authority demonstrated that eligibility for admission was largely determined by household income, though employment and family structure were common criteria for admission. Household income was limited to a narrow band between 5 and 6 times the rent; enough to afford the rent but not so high as to include families without need. Household heads

were expected to be employed, although in some cases families experiencing depression-related unemployment were admitted. Married couple households with children were often preferred.

We will use coarsened exact matching (CEM) to select comparison individuals from the two comparison groups who match public housing residents on income, household head employment, and family structure. CEM is the preferred technique when there are limited and known criteria that select cases into treatment and has the benefit of obtaining exact covariate balance between treatment and control. Additionally, CEM allows for more than one matched control per treated case, but requires a large number of untreated cases from which to select matched individuals.

Preliminary Results

Table 1 presents the sample of public housing residents and comparison groups in the full count 1940 census. These baseline characteristics suggest that public housing households tend to be more likely to have children and have higher employment rates for household heads. Rents in public housing units tend to be slightly higher than in neighboring units and lower than in units citywide.

Table 1: Preliminary Sample Characteristics of Public Housing and Comparison Households in 1940

	Public Housing 1940	Neighbor 1940	Citywide 1940
Total Households	29,407	110,620	6,186,449
Total Individuals	101,482	387,507	21,367,966
% ages <18	39%	29%	26%
% ages 18-30	30%	24%	24%
% head employed	87%	70%	75%
Mean Rent (\$)	\$21	\$18	\$28

Source: Team's calculations from 1940 full count census

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