

The Housing and Children's Healthy Development Study

HUD Baseline Report



PD&R



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**The Housing and
Children's Healthy Development Study**

HUD Baseline Report

Prepared for
U.S. Department of Housing and Urban Development
Office of Policy Development and Research

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November 2021

Foreword

The Housing and Children's Healthy Development Study: Final HUD Baseline Report documents the research questions, methods, and baseline findings of a remarkable and unique research project—the first-ever (and, as of this writing, the only) rigorous investigation of the impact of the Housing Choice Voucher (HCV) program on children's health and development. Previous research has not shown the causality of safe, quality housing on childhood development, and provides a limited understanding of the location decisions and tradeoffs of lower-income parents. This study aims to address and overcome limitations that have traditionally made this type of analysis difficult. A more sophisticated understanding of how safe, quality affordable housing affects childhood development will enable HUD to target and use its resources more effectively.

The HCV program is HUD's largest housing assistance program. To test the impact of receiving housing assistance, families in the Housing and Children's Healthy Development Study were randomly assigned to a treatment group who were offered HCV and to a control group of families who were not. The study was conducted in two cities: Cleveland, Ohio, and Dallas, Texas. The study introduces innovative methods to measure physical health, cognitive skill, emotional development, and parent-child interactions in the treatment and control group families. The study features a probability sample of families that included low- middle-, and high-income families who did not apply for a HCV. The random assignment component of the study will provide strong evidence of impacts if any are observed; the probability sample provides a unique way to contextualize the outcomes of HCV families.

This report presents baseline findings by summarizing the demographic and economic characteristics of the sample (both treatment and control families). The report poses questions and describes methods but gives no answers. Thus, we must await further analyses for answers to the critical questions presented in the report. The documentation of the study's motivations, methodology, samples, and data collection efforts is essential to understanding future impact analyses. The baseline data comprise a systematic collection of data on the housing, neighborhood, family, health, and developmental characteristics of children on HCV waiting lists. To my knowledge, this dataset is the only one of its kind in existence.

The Housing and Children's Healthy Development (HCHD) study was conceived and developed by the MacArthur Foundation's Research Network on How Housing Matters for Children and Families, originally chaired by Tom Cook of Northwestern University. Sandra J. Newman of Johns Hopkins University and Tama Leventhal of Tufts University are the principal and co-principal investigators, respectively. The University of Michigan's Survey Research Center implemented the complicated data collection protocols under challenging conditions in Cleveland and Dallas. The MacArthur Foundation, the National Institute of Child Health and Human Development, and the U.S. Department of Housing and Urban Development funded the study. I'd like to thank our partners and the participants of the study, and I hope this study will

become a valuable resource for researchers seeking to understand the Housing Choice Voucher program and its impacts on families and children.

A handwritten signature in black ink, appearing to read "Solomon Greene". The signature is fluid and cursive, with a large initial "S" and "G".

Solomon Greene
Principal Deputy Assistant Secretary for Policy Development and Research
U.S. Department of Housing and Urban Development

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Motivations and Objectives

The goal of the Housing and Children’s Healthy Development (HCHD) Study is to close longstanding gaps in our understanding of how children’s residential context—home, neighborhood, school, and family—affects their healthy development. One major impediment to knowledge building has been the absence of a longitudinal database with rich measurement of the residential context: children’s development and family background. Even when researchers use creative approaches to analyze existing data, a second obstacle is the inability to confidently infer causal relationships. HCHD addresses both deficiencies. It is creating a unique longitudinal database consisting of a panel survey with approximately 1,800 families and collecting multiple detailed measures of the home, neighborhood, schools, family background, and child development.

The centerpiece of HCHD is a randomized controlled trial (RCT): families who applied for a housing voucher were randomly sorted into voucher winners and losers. The housing voucher program¹ allows recipients to rent housing in the private market as long as the dwelling meets minimum quality standards and the landlord agrees to participate in the program.² The RCT design produces random variation in families who received significant support worth approximately \$8,000 (2017\$) to move to better housing, neighborhoods, and schools. HCHD is the only RCT ever to investigate the impact of the housing voucher program, as implemented by public housing authorities (PHAs) across the nation, on children’s healthy development.³ Data collected from RCT primary caregivers and children include baseline biomarkers of stress and inflammation and assessments of children’s cognitive achievement, their self-regulation, and parent-child interactions. The voucher experiment surveys will be linked to a range of federal, state, and local administrative records.

HCHD is designed to address four policy research questions:

(1) What are the effects of housing on children net of the other important influences on children’s lives, including their families, neighborhoods, and schools? Until solid evidence demonstrates that children’s well-being is (or is not) affected by housing per se, distinct from the effects of other aspects of children’s physical and social world, researchers are not equipped to debate the value of housing policies from a child perspective. As noted earlier, despite the best efforts of researchers, existing databases cannot be used to tease out the separate effects of housing because these databases do not measure the different domains in children’s lives, and

¹ Based on https://www.hud.gov/program_offices/public_indian_housing/programs/hcv/about/fact_sheet.

² The housing voucher program is administered by public housing authorities (PHAs), which are funded by the U.S. Department of Housing and Urban Development to administer the program. The PHA pays the subsidy to the landlord, and the voucher recipient pays the difference between the actual rent and the subsidy, usually around 30 percent of income.

³ The HCHD study emanates from a multiyear research effort of the MacArthur Foundation’s “Research Network on How Housing Matters for Children and Families.” Network members were T. Cook (chair), D. Acevedo-Garcia, S. DeLuca, G. Duncan, K. Edin, T. Leventhal, J. Lubell, J. Ludwig, S. Newman, M. Pattillo, and S. Raudenbush. Project officers E. Poethig and I. Kachoris, and Vice-President for Housing M. Stegman, played a major role in the initiation and success of the Network.

“housing” measurement is scant, superficial, and not designed from the vantage point of child well-being. Moreover, existing data sources do not allow the identification of housing as a *cause* (as opposed to a *correlate*) of child well-being. Policy requires a clear understanding of cause and effect.

(2) What features of housing matter most? If housing has an effect on children, sound policy requires explicit targets specifying what aspects of housing are key. HCHD is collecting a comprehensive set of housing measures that pertain to children’s development. These measures will isolate the aspects of housing that make a difference in children’s outcomes.

(3) For whom and in what circumstances does housing matter? Policy also needs population targets, primarily the demographic and socioeconomic groups who are most affected by housing or could benefit most from policy intervention. Families with young children and low incomes, the focus of HCHD, are highly heterogeneous along multiple dimensions ranging from family structure to neighborhood attributes. Housing is unlikely to affect all subgroups in the same way. HCHD should help clarify how the effects of housing differ across the diverse characteristics of this population.

(4) How do families with young children make housing, neighborhood, and school choices; what are the effects of these choices; and how would these effects change if their choices changed? It is difficult to design effective policies without understanding how families make decisions about housing, neighborhoods, and schools. One puzzling fact about the voucher program highlights our lack of insight: why do roughly 20 percent of voucher recipients relinquish their vouchers (currently worth roughly \$10,000) even though they are still income-eligible for this substantial subsidy? HCHD supports the analysis of why families make the choices they do and the effects of these choices. This evidence can be used to estimate the benefit of allocating resources to promote healthy child development.

Background

By and large, the policy questions driving HCHD cannot be answered with existing data. With the exception of the direct effects of environmental toxins, allergens, and safety hazards on children’s health, evidence on the effects of housing features on children’s well-being is weak at best (Leventhal and Newman, 2010). Such causal links are plausible. Crowding, for example, may be related to child development because lack of personal space and privacy and the presence of noise may impede the healthy functioning of children and their families (Evans, 2003; Gove, Hughes, and Galle, 1979). Physically inadequate housing could pose risks of physical injury and might also contribute to psychological stress (for example, Sandel and Wright, 2007).

Qualitative work suggests the financial strain from unaffordable housing may be a source of stress and residential instability for low-income families with children (Edin and Lein, 1997).

Other work suggests that housing deprivation may be linked to economic well-being in later life (Conley, 2001).

Housing vouchers present several possible pathways to effects on children's well-being. By definition, a housing voucher makes standard, decent housing affordable. The family's disposable income increases, and the physical conditions of the housing unit and the quality of the neighborhood (for example, safety, upkeep, peers, role models) may also improve. Each of these potential pathways—greater disposable income, better quality housing, better quality neighborhoods—could directly affect young children's well-being, including their cognitive achievement, socioemotional functioning, and health (Akee et al., 2010; Brooks-Gunn and Duncan, 1997; Leventhal and Brooks-Gunn, 2000; Leventhal and Newman, 2010). Parents' health also may benefit from voucher-induced changes in housing, neighborhood, and family economic conditions (Akee et al., 2010; Ludwig et al., 2011). Given the primacy of the family context in early childhood, benefits for parents could indirectly benefit children, such as by reducing family stress or by exposing families to models of healthy lifestyles, such as regular mealtime, bedtime, and activity routines (Conger and Donnellan, 2007).

Low-income parents' decisionmaking about where to live is also not well understood, even though it determines children's residential environment. Low-income parents face serious constraints when searching for housing, which may undermine their children's healthy development. Scarce resources tend to constrain not only the size and physical quality of the dwelling units in which children grow up but also the quality of their neighborhoods and schools. As a result, low-income parents face tradeoffs among the quality of the dwelling, the neighborhood, and the school, with money spent on one aspect of quality leaving less to spend on other aspects, which can result in difficult choices. For example, if parents prize quality schools and low crime rates, they may opt to spend significantly more than 30 percent of their income on rent, requiring that they work additional hours, thereby being less available to their children. This financial drain, in turn, may stress the parents to the point of becoming harsh and punitive with their children (Conger, Conger, and Martin, 2010). It may even prompt another move in search of more affordable housing. Such effects of the parents' tradeoffs—increased work hours, harsh parenting, and moving—could have deleterious consequences on children's development.

Insights into low-income parents' location decisions and tradeoffs; what effects these decisions have on children's cognitive, social, emotional, and health outcomes; and what facilitates these effects hold promise for developing more effective policies to foster healthy child development. The scientific literature provides little guidance on how housing attributes that matter for children are priced in the market. Federal policy, including the housing voucher program, is designed to improve parents' housing options, but its success depends strongly on how parents understand their housing options and how they make housing choices. Very little is known about the information parents have regarding their options and how they use this information to make choices. These gaps in the literature about tradeoffs parents make in finding a place to live and the effects of the resultant residential context on children's healthy development are central for designing policy. HCHD aims to fill these gaps.

Objectives of the Baseline Report

The remainder of this report describes HCHD’s study design, reviews the baseline data, and highlights key points in a final discussion section. The description of the study design includes an overview of the study sites, sampling plan, randomization of treatment and control groups in the voucher experiment, response rates in Waves 1 and 2, data collection procedures, topics covered and measurement, and innovations. The report then establishes the profile of the Wave 1 voucher experiment, including the characteristics of families and children and their housing and neighborhoods.

Study Design

HCHD is a longitudinal study of families with children 3 to 10 years of age at the study’s inception. It has two components: an RCT of the U.S. Department of Housing and Urban Development (HUD) Housing Choice Voucher program (the “voucher” sample) and a supplementary income-stratified probability sample drawn from block groups in the same sites with a high proportion of households earning less than \$35,000 annually (the “population” sample; see below for more details on sampling). The voucher sample consists of randomly selected families who applied for a housing voucher, some of whom received one (“treatment” group) and the remainder who did not (“control” group). Families in both the voucher and population samples have been followed in two waves of data collection. Wave 1 interviews were conducted in person in 2017–2018, before families in the voucher treatment group received a voucher.⁴ Wave 1 data are critical for establishing the integrity of the RCT at baseline. Because Wave 2 occurred in 2020–2021 in the midst of the COVID-19 pandemic, interviews were conducted by telephone.⁵ Wave 2 is important for examining differences in early outcomes (1–2 years from voucher receipt) between treatment and control families. The focus of this report is Wave 1 and the voucher sample.

Wave 1 data were collected from 1,788 primary caregivers (voucher and population samples), most often mothers (89 percent), and up to two randomly chosen age-eligible children in the household. The final Wave 1 child sample size was 2,473. The response rate was 79 percent for Wave 1 and 85 percent for Wave 2.⁶ In addition to conducting personal interviews, Wave 1 also collected data through self-administered questionnaires and interviewer assessments, including several innovative elements described below.

⁴ Nine families were housed using a voucher before their Wave 1 interview. When including or excluding the nine families, there were no differences in demographic, family, housing, neighborhood, or health characteristics of the voucher treatment group baseline characteristics.

⁵ HCHD offers the opportunity to study the effects of receiving a housing choice voucher on child and family well-being during the COVID-19 pandemic.

⁶ Response rates were calculated in accordance with the American Association for Public Opinion Research’s guidelines and are based on the number of completed interviews proportional to the number of eligible cases, which includes completed cases, incomplete cases, and nonrespondents. They assume that a portion of nonrespondents would be deemed ineligible for study participation.

Study Sites

HCHD is being conducted in the Cleveland and Dallas metropolitan areas, two geographically and ethnically diverse sites. Budget constraints limited HCHD to two sites. To select study sites, we began by reviewing the characteristics of all PHAs where the offer of a voucher relied on randomization. Both the Cuyahoga Metropolitan Housing Authority (CMHA) and the Dallas Housing Authority (DHA) met this criterion. Beyond this randomization requirement, we used three additional selection criteria: (1) variation in geographic location, housing market characteristics, and the racial and ethnic mix of the population in the metropolitan area; (2) “high performance” based on HUD’s assessment of PHA management and reputation in the field;⁷ and (3) commitment to participating in HCHD.

Context

Cleveland is an old, once industrial city in the Midwest, and Dallas is a newer city in the southwest Sun Belt. Consistent with these divergent histories, these cities have followed roughly opposite population size trajectories for decades.⁸ Referring to the population trajectory, the Census Bureau has characterized Cleveland as one of the nation’s cities that are the “biggest losers” and Dallas as one of the nation’s largest cities (*New York Times*, 1991). Between 1980 and 2019, Cleveland lost roughly one-third of its population, with a 2019 population size of about 385,000. By contrast, Dallas’ population grew by more than 40 percent over the same period, with a 2019 population estimated at more than 1.3 million residents.

The disparity in the financial profile of residents in these two cities also is dramatic. In Cleveland, the 2019 median gross rent was \$719, median household income was roughly \$30,000, and nearly one-third of residents had incomes below the poverty line. In Dallas, median gross rent was 50 percent higher than in Cleveland, at more than \$1,000, median household income was \$53,000, and about 19 percent of residents were below the poverty line.

Because both CMHA and DHA operate in most of their metropolitan areas,⁹ these larger geographies provide the appropriate context for the HCHD voucher experiment. These metro areas encompass suburban jurisdictions outside the central city that, unsurprisingly, have an economically more robust profile. Although disparities between the areas persist, they are generally less dramatic than comparisons of their central cities. For example, 2019 poverty rates are much smaller in the metro area than the central city (Cleveland = 13.5 percent; Dallas = 10.5 percent) and median incomes are considerably higher (Cleveland = \$53,359; Dallas = \$66,220).¹⁰ Demographically, the most striking difference between the Cleveland and Dallas

⁷ Based on interviews with knowledgeable observers.

⁸ All city statistics are based on Census Quick Facts at <https://www.census.gov/quickfacts/clevelandcityohio> and <https://www.census.gov/quickfacts/fact/table/dallascitytexas/PST045221>.

⁹ CMHA operates in roughly 60 percent of the Cleveland metropolitan area, and DHA operates in about 93 percent of the Dallas metro area. (In both cases, this report defines the metro area by OMB’s definition of *Core-Based Statistical Area*.)

¹⁰ Metro area statistics are based on the 2019 American Housing Survey metropolitan area files. Persons in poverty based on <https://censusreporter.org/profiles/31000US19100-dallas-fort-worth-arlington-tx-metro-area/>.

metros is ethnicity. Hispanics constitute nearly 23 percent of the Dallas metro compared with roughly 6 percent in Cleveland. The share of residents who identify as Black differs by only about 4 percentage points (Cleveland = 21.3 percent; Dallas = 17.3 percent). The differential between these metros in the fraction identifying as White only is considerable: nearly 70 percent in the Cleveland metro versus 52 percent in the Dallas metro.

Not surprisingly, the age of the rental housing stock differs significantly between these two metro areas. In Dallas, nearly one-half of dwelling units (46.8 percent) were built after 1980. The rate in Cleveland is only about 10 percent, with nearly 90 percent having been built in 1980 or earlier. Nonetheless, the difference in structure type is modest, with the fraction of apartments at about 62 percent of all rentals in the Cleveland metro and 71 percent in the Dallas metro.

Because housing vouchers are used to rent a dwelling, the status of the rental market is the best barometer of what voucher holders are likely to confront when searching for a place to live. We further focus this market description on units renting below the metro area median rent in an attempt to target housing units eligible for a voucher, which must have first-year rents \leq the 40th percentile of rentals in the metro area.¹¹

As shown in exhibit 1, both metros have relatively high vacancy rates among below-median-rent units: 9.4 percent in Cleveland and 11.8 percent in Dallas. These statistics signify relatively loose rental markets below the median rent.

¹¹ All data in this section are based on the metro files of the 2019 American Housing Survey.

Exhibit 1. Cleveland and Dallas Metropolitan Area Housing Market Characteristics, Below-Median-Rent Units

| | Below-Median-Rent Units | |
|---------------------------------|--------------------------------|---------------|
| | Cleveland | Dallas |
| % vacant | 9.4 | 11.8 |
| Mean rent | \$471 | \$721 |
| Median rent | \$530 | \$800 |
| % inadequate | 8.4 | 6.6 |
| % 3+ upkeep problems | 1.6 | 3.2 |
| % Rodents | 19.0 | 5.3 |
| % Petty crime in neighborhood | 38.8 | 26.4 |
| % Serious crime in neighborhood | 22.1 | 11.1 |
| % Good school in neighborhood | 81.6 | 89.8 |
| Number of observations | 283 | 425 |

Notes: Standardized weights; (unweighted N). Includes occupied and unoccupied units for rent. Vacancy rate based on “01” For Rent Only; “02” For Rent or For Sale; and “04” Rented but Not Yet Occupied. “Inadequate” units are severely or moderately inadequate units as defined by HUD. “Severely inadequate” applies to units with plumbing, heating, electrical, or wiring issues or at least five maintenance (upkeep) issues. “Moderately inadequate” applies to units with three or four maintenance (upkeep) problems or in which all flush toilets were broken at the same time three or more times in the past 3 months; have unvented gas, oil, or kerosene heaters as the main heating equipment; or lack a kitchen sink, working refrigerator, stove/oven or share a kitchen with nonhousehold members. Upkeep problems include outside water leaks, inside water leaks, holes in floors, and holes/cracks in walls or ceiling. “% rodents” indicates that resident has seen rodents at least a few times in the past 12 months. Median rents for these metro areas (2019\$) are \$700 in Cleveland and \$1,000 in Dallas.

Source: 2019 Metropolitan AHS

The structural and physical adequacy of below-median-rent units presents a mixed picture. Using HUD’s updated measure of adequacy, the fraction of units with problems is similar: 8.4 percent in Cleveland versus 6.6 percent in Dallas. Units in the Dallas metro are twice as likely as those in the Cleveland metro to have upkeep problems, although the rates are low: 3.2 percent and 1.6 percent, respectively. Nearly one-fifth (19 percent) of Cleveland metro units with rents below the median have rodents compared with 5 percent of units in the Dallas metro.

Neighborhood problems also paint a mixed picture. In both metros, the schools in the vicinity of below-median-rent units are likely to be described as good (Cleveland = 82 percent; Dallas = 90 percent). In the Cleveland metro, residents of below-median rentals are twice as likely as Dallas metro residents to report that there is serious crime in the neighborhood (22.1 percent and 11.1 percent, respectively). A disparity also exists for reports of petty crime in the neighborhood, but it is smaller (Cleveland = 38.8 percent; Dallas = 26.4 percent).

Cuyahoga Metropolitan Housing Authority

CMHA serves all of Cuyahoga County, including the city of Cleveland, Ohio, and its inner suburbs. At the study's inception, CMHA's portfolio included 25,729 assisted housing units comprising 9,284 public housing units, 15,269 Section 8 vouchers, and 1,176 multifamily units that represent several different HUD project-based (or multifamily) assisted housing programs. CMHA's tenant population included 33.4 percent who were part of family households with one or more children younger than 18; 27.4 percent who were in households headed by a person 62 years of age or older; and 36.2 percent who were disabled either physically or mentally.¹² The large majority of tenants were Black (89.2 percent), 8.4 percent were White, and 2.4 percent were another race. Roughly 7 percent were Hispanic, and 93 percent were not Hispanic.

Dallas Housing Authority

DHA serves the city of Dallas and seven counties across North Texas: Collin, Dallas, Denton, Ellis, Kaufman, Rockwall, and Tarrant. At the study's outset, DHA's portfolio included nearly 22,000 assisted housing units, with 7,000 in which the tenant was using a housing choice voucher; 1,800 multifamily units; and 3,000 public housing units. Roughly 50 percent of households were families with one or more children younger than 18 years old, 21 percent were headed by someone 62 years of age or older, and about 24 percent were headed by a non-senior person with a disability. The large majority of tenants were Black (85.3 percent), 8.6 percent were White, and the remaining 6.1 percent were other races (including 2 percent who were Asian). In addition, 6.2 percent reported being Hispanic, and 92.3 percent reported being non-Hispanic (1.5 percent declined to report ethnicity). The disparity between the 23 percent of residents reporting being Hispanic in the 2019 Census data presented earlier and the 6 percent receiving housing assistance from DHA is noteworthy. Undocumented status and ineligibility for housing assistance may explain part of this disparity.

Public Housing Authority Liaison

Quadel Consulting & Training, LLC, a well-known assisted housing consulting firm that has worked with numerous PHAs, was a liaison between the research team and both CMHA and DHA. Quadel maintained regular communications with each PHA, assisted with developing the Memorandum of Agreement covering the PHAs' participation in the study and data sharing, helped develop a protocol to track voucher recipients using administrative data, and assisted with general troubleshooting.

Sample

The study's two samples, the voucher sample and the population sample, shared three main eligibility criteria: (1) the household had at least one child between the ages of 3 and 10; (2) the child spent at least three nights per week, on average, in this household; and (3) the interview

¹² Categories are not mutually exclusive.

could be conducted in English or Spanish. All data collection procedures were the same across samples except for blood samples, described later.

Voucher Experiment Sample

The voucher sample consists of applicants for housing vouchers who were either randomly assigned to the active voucher waiting list or not assigned to the active waiting list by CMHA and DHA. Both housing authorities provided applicants with a brief description of HCHD. Applicants who did not want to participate in the study checked an “opt out” box and were not contacted. A brief description of the randomization procedure used by each PHA follows.

Cuyahoga Metropolitan Housing Authority Randomization

CMHA used its 2015 waiting list for the HCHD voucher experiment. CMHA relied on a contractor to handle all aspects of this waiting list, including randomization. The announcement about the opening of the 2015 waiting list generated more than 50,000 applicants. After eliminating duplicate cases, the contractor randomized the remaining list. CMHA placed the top 10,000 applicants on the active waiting list. In March 2017, during the preparations for the study, 9,429 cases remained on this waiting list. Applicants were sent information about HCHD and offered the option of participating in the study if they had at least one child 3 to 10 years old. Of the 9,429 remaining waitlist cases, 2,894 met the child criterion. Roughly 29 percent of these applicants opted out of participating in the study.¹³ We selected the treatment group from the remaining 2,041 cases.

The control group was selected from cases that were not put on the active waiting list. This non-waitlist group was also randomized. Of the full non-waitlist group, 8,138 had a child 3 to 10 years old and did not opt out of HCHD. These cases constituted the CMHA control group for the voucher experiment.

Dallas Housing Authority Randomization

DHA established a new waiting list for the HCHD voucher experiment, designating families with one or more children between ages 3 and 10 as a preference group. This waiting list was advertised from April 6–18, 2017, with roughly 14,000 applications received during the open enrollment period, April 18–24, 2017. After using its newly adopted Yardi software to remove duplicate cases and those with no child 3 to 10 years old in the household, the waiting list contained 8,436 cases.¹⁴ These cases were randomized using Yardi. DHA then created an active waiting list containing 5,000 cases, assigning numbers 1–5,000 to the randomly sorted cases. Of these 5,000 cases, roughly 35 percent (1,737 cases) opted out of the study. The treatment group was selected in order from the remaining 3,263 applicants on the list.

The cases not selected for the active waiting list numbered from 5,001 to 8,436. Once again, roughly 35 percent (1,215 cases) opted out of the study, leaving 3,435 applicants in the non-

¹³ Proportion is rounded.

¹⁴ Yardi is a software product that has been widely adopted by PHAs.

waitlist group. DHA used the Yardi software to randomize this non-waitlist group. These cases constituted the control group for the voucher experiment.

The randomization was successful, as displayed in exhibit 2 (omnibus F tests are insignificant; see last table entries). The opt-in rates are also noteworthy: 71 percent for CMHA and 62 percent for DHA. Both are dramatically higher than opt-in rates for the Moving to Opportunity experiment, in which only 25 percent volunteered for the study. Chyn (2017) demonstrated the negative selectivity of volunteers, which seriously undermines external validity. At this writing, voucher takeup rates are 59.1 percent for CMHA and 60.3 percent for DHA.

Exhibit 2. Randomization of Voucher Sample, HCHD

| | Treatment | Control |
|--|------------------|----------------|
| Primary Caregiver | | |
| Age at baseline, years | 32.1 (8.7) | 32.6 (8.3) |
| Race/ethnicity, % | | |
| White non-Hispanic/Latino only | 3.6 (18.7) | 4.7 (21.3) |
| Black non-Hispanic/Latino only | 74.2 (43.8) | 67.4 (46.9) |
| Other non-Hispanic/Latino race/ethnicity | 11.9 (32.4) | 12.8 (33.5) |
| Hispanic/Latino | 10.4 (30.5) | 15.1 (35.9) |
| Education, % | | |
| GED or below | 16.0 (36.7) | 17.7 (38.2) |
| HS graduate | 35.3 (47.8) | 34.6 (47.6) |
| Some college or degree | 48.7 (50.0) | 47.6 (50.0) |
| Two-parent household, % | 17.5 (38.1) | 20.3 (40.3) |
| Mean annual income, 1,000s | 23.2 (19.0) | 24.4 (21.4) |
| Children | | |
| Mean child age at baseline, years | 6.2 (2.4) | 6.4 (2.4) |
| Number of places child lived, <i>n</i> | 2.7 (1.2) | 2.7 (1.2) |
| <i>Parent total N</i> | 461 | 434 |
| <i>F(8, 778) = 0.64, p = .745</i> | | |
| <i>Child total N</i> | 634 | 597 |
| <i>F(2, 1,147) = 1.73, p = .177</i> | | |

GED = general equivalency diploma. HS = high school.

Mean differences: * $p < .05$. ** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. Other non-Hispanic/Latino race/ethnicity includes those who were non-Hispanic/Latino and reported American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, “something else,” or multiple race/ethnicities.

We aimed for equal sample sizes in the two sites and approximately an equal number of treatment and control cases. The goal was to interview 848 households and 1,170 children (424 households in each site comprising 212 treatment and 212 control households). As shown in exhibit 3, we exceeded this goal, interviewing 895 households and 1,231 children. The response rate specifically for the voucher sample was 82 percent.

Exhibit 3. Voucher Sample, Completed Wave 1 Interviews

| | Cleveland | Dallas | Total |
|----------------------|-----------|--------|-------|
| Primary Caregiver | | | |
| Voucher—Treatment | 226 | 235 | 461 |
| Voucher—Control | 211 | 223 | 434 |
| Total Voucher Sample | 437 | 458 | 895 |
| Children | | | |
| Voucher—Treatment | 305 | 329 | 634 |
| Voucher—Control | 282 | 315 | 597 |
| Total Voucher Sample | 587 | 644 | 1,231 |

Population Sample

The population sample design was developed in collaboration with the sampling division of the Survey Research Center (SRC) at the University of Michigan and under the direction of T. Raghunathan, then-director of SRC. It is a stratified random sample of households in the Cleveland and Dallas metropolitan areas. The population sample was generated through a multistage procedure using several commercial databases. At the first stage, all U.S. Census block groups in each site were stratified into three income groups (low, medium, and high) on the basis of their metropolitan area’s median family income according to the 2015 American Community Survey. Next, block groups were sampled, with the goal of oversampling low-income block groups, using a ratio of 3:2:1 for low-income, middle-income, and high-income¹⁵ block groups, respectively. Within the selected block groups, households were then randomly sampled and screened at the doorstep for the same eligibility criteria as the voucher sample. The target sample sizes were also similar to the voucher sample: 868 households divided evenly across the two sites. Exhibit 4 shows the sample size targets. Exhibit 5 indicates that, as with the voucher sample, we also exceeded the target size with the population sample, interviewing 894 households and 1,194 children. The response rate specifically for the population sample was 72 percent.

The population sample allows a description of the range of housing and other contextual features that may affect children’s development. By design, the weighted estimates generated from the population sample are representative of each of the geographic sites from which they were drawn. To complement the voucher sample, low- and moderate-income families were

¹⁵ In Dallas, the proportions were as follows: low-income block groups = 51 percent or more of households had incomes <\$35,000; middle-income block groups = 27–51 percent of households had incomes <\$35,000; and high-income block groups = <27 percent of households had incomes <\$35,000. The average annual income for each group was as follows: low income = \$21,282; middle income = \$45,585; and high income = \$93,592. In Cleveland, the proportions were as follows: low-income block groups = 61 percent or more of households had incomes <\$35,000; middle-income block groups = 38–62 percent of households had incomes <\$35,000; and high-income block groups = <38 percent of households had incomes <\$35,000. The average annual income for each group was as follows: low income = \$14,682; middle income = \$37,498; high income = \$73,396.

oversampled. Higher-income families were sampled to supplement the voucher sample. Doing so provided a broader range of families and potential housing and other contextual conditions. We also included these families because housing challenges affect families across much of the income distribution.

Exhibit 4. Population Sample Design, Targeted

| Primary Block Group Strata | Sampling Rate | Number of Households | | |
|----------------------------|---------------|----------------------|--------|-------|
| | | Cleveland | Dallas | Total |
| Low-income | 0.50 | 217 | 217 | 434 |
| Middle-income | 0.33 | 145 | 145 | 289 |
| High-income | 0.17 | 72 | 72 | 145 |
| Total | 1.0 | 434 | 434 | 868 |

Exhibit 5. Population Sample, Completed Wave 1 Interviews

| Primary Block Group Strata | Sampling Rate | Number of Households | | |
|----------------------------|---------------|----------------------|--------|-------|
| | | Cleveland | Dallas | Total |
| Low-income | 0.50 | 291 | 270 | 561 |
| Middle-income | 0.33 | 116 | 136 | 252 |
| High-income | 0.17 | 39 | 41 | 80 |
| Total | 1.0 | 446 | 447 | 893 |

Data Collection Procedures

SRC, the survey contractor, deployed trained interviewers to conduct Wave 1 interviews, typically in the primary caregiver’s home. The average interview lasted about 2 hours. In the case of a two-child household, two home visits were often required to complete the data collection.

The data collection included multiple protocols. Personal interviews were conducted with primary caregivers using computer-assisted personal interviewing (CAPI), the primary caregiver completed a short, self-administered questionnaire, and interviewers also collected physical measures from primary caregivers and children (for example, height and weight) and, for the voucher sample, dried blood spots for blood biomarkers. In addition, children were administered standardized tests of reading and math achievement and a computerized task evaluating executive functioning, a key component of self-regulation. Interviewers also collected systematic observations of the home environment using established subscales of the Home Observation for Measurement of the Environment, better known as HOME (Caldwell and Bradley, 1984); the neighborhood environment, defined as the eight-block faces surrounding the households’ housing units; and parent-child interactions.

Instruments and Protocols

Data collection instruments include a combination of established, tested questions (for example, cognitive achievement, Patient-Reported Outcomes Measurement Information System [PROMIS®] measures of health¹⁶) and newly developed questions that address the key issues motivating the study (for example, preferences and tradeoffs, child-relevant housing features, biomarker measures of healthy child development). Exhibit 6 summarizes the topics covered in the Wave 1 survey. Primary caregivers and children were compensated for their participation (for example, primary caregivers received \$50 for the main interview, children received \$25 for the main assessments, and caregivers received \$25 for the daily diary described later). Exhibit 7 describes the key measures in the Wave 1 data collection.

Exhibit 6. Topics Covered in HCHD Study Protocols, Wave 1

| Adult Interview and Assessments | Child Interview and Assessments | Additional Assessments and Observations |
|--|---|--|
| <ul style="list-style-type: none"> - Residential mobility, crowding, privacy, and space - Housing quality - Other housing features - Housing costs - PHA applicant questions - Preferences and tradeoffs - Neighborhood - Neighborhood vignettes - Respondent general info - Employment information - Spouse/partner/other parent information - Household income, assets, and debts - Mental health - Health - Physical measures (height, weight, blood pressure) - Blood spot collection - Challenges to parenting - Family environment and routines - HOME - Discipline of child - Child demographics | <ul style="list-style-type: none"> - Hearts and flowers executive function task - Preschool self-regulation assessment - Woodcock-Johnson (Applied Problems) - Woodcock-Johnson (Letter-Word identification) - Physical measurements (height, weight, waist, hips) - Blood spot collection - Thin-slice observation of cognitive sensitivity/Lego activity | <ul style="list-style-type: none"> - Neighborhood observations - Physical environment of home - Square footage of living space in the dwelling (measured by laser tape) |

¹⁶ Patient Reported Outcomes Measurement Information System (PROMIS) measures were developed by a National Institutes of Health (NIH) committee as part of the NIH Roadmap. (<https://commonfund.nih.gov/promis/index>).

| Adult Interview and Assessments | Child Interview and Assessments | Additional Assessments and Observations |
|---|--|--|
| - Child's room - Child's residential background - Childcare and preschool - School - Child's behavior - Child health | | |

HOME = Home Observation for Measurement of the Environment. PHA = Public Housing Authority.

Exhibit 7. Key HCHD Measures in Wave 1

| Domain | Measures | Description |
|------------------------------------|---|--|
| Child Outcomes | | |
| <i>Cognitive</i> | Woodcock-Johnson Letter-Word (reading) Woodcock-Johnson Applied Problems (math) | Widely used tests of achievement |
| <i>Socioemotional</i> | Behavior problems (Behavior Problems Index) | Widely used, validated instrument assessing socioemotional behavior problems |
| | Executive functioning (Hearts & Flowers) | Children must respond quickly to images of hearts and flowers in different ways; tests inhibitory control, working memory, and cognitive flexibility |
| | Self-Regulation | PSRA |
| <i>Health</i> | Biomarkers: height, weight, waist-to-hip ratio | Used to assess child obesity, a key indicator of a child's health |
| | PCG overall assessment of child's health | Widely used health measure |
| | Physical limitations | Used to assess severity of any physical or mental health issues that limit play or school |
| | Specific health issues (asthma, allergies [respiratory, skin], headaches, diabetes) | PCG asked if a doctor ever said child had each specific illness/health issue |
| | Child's sleep patterns/problems | CSHQ: used to determine if a child is likely to have a sleep disorder |
| | Dried blood spots: HbA1c, IL-6, CRP | Collected ONLY for the voucher sample—measures of glucose, inflammation, and stress |
| Housing Size & Crowding | # bedrooms, # bathrooms, # other rooms | Used as objective measures of physical space |

| <i>Domain</i> | <i>Measures</i> | <i>Description</i> |
|--------------------|--|---|
| | Place for child to read, work, do homework? | Measure of child's privacy |
| | Identify room where respondent child sleeps | Measure of child's privacy |
| | Place for child to play outdoors? | Measure of personal space |
| | Interviewer laser tape measure of rooms in unit | Objective measure of unit size |
| | PCG: Do you have enough space? | Subjective report of personal space and crowding |
| <i>Costs</i> | Tenure (own or rent) | Required to assess housing costs for the population sample |
| | Monthly payments (rent or mortgage) | Primary housing cost |
| | Other costs (for example, taxes, insurance, gas, electricity, water) | Additional housing costs sometimes included with rent |
| <i>Quality</i> | Broken windows, cracks/holes in walls, peeling paint; rats/mice/roaches; kitchen sink, refrigerator, stove; heat working; mold | Standard measures of housing quality used in the American Housing Survey |
| <i>Safety</i> | PCG: How safe do you feel in your neighborhood? | Asked in both the PCG interview and SAQ |
| | PCG: How safe do you feel in the immediate area right outside your home? | Asked in PCG interview |
| <i>Preferences</i> | <p>“What do you consider the most important features of a nice apartment or house?”</p> <p>“What do you consider the most important features of a good neighborhood?”</p> <p>PCG ratings: “What do you like most about the place where you live now for your child?”</p> <p>“What do you like least about the place where you live now for your child?”</p> <p>“Which features are most/least important?” (nice home, good neighborhood, good schools)</p> <p>Questions that assess how much the PCG would be willing to pay for each feature. Vignettes that ask about the importance (how much they are willing to pay in rent) of physical condition, neighborhood safety, and schools.</p> | PCG & SAQ questions designed to elicit information about the types of tradeoffs households say they consider when deciding where to live, which can be compared with the characteristics of the housing units and neighborhoods where households choose to live |
| <i>Mobility</i> | # years in current home | SAQ measure of tenure |
| | Reason(s) for moving | SAQ measure |

| <i>Domain</i> | <i>Measures</i> | <i>Description</i> |
|--|---|---|
| Neighborhood Measures | | |
| <i>Interviewer Observations</i> | 8 block faces—physical condition of buildings, roads; physical disorder (garbage, graffiti, abandoned cars, drug/alcohol/cigarette litter); social disorder (drugs, alcohol, litter); land uses | Questions modified from MTO study |
| <i>PCG Rating</i> | How would you rate your neighborhood as a place to live? | Scale of 1 “Very Satisfied” to 4 “Very Dissatisfied” |
| School | | |
| <i>Preferences</i> | “What do you consider the most important features of a good school?” | Options include— 1. Children are getting a good education 2. Children are well-behaved 3. High test scores 4. Teachers care about the children 5. School is safe |
| <i>Location</i> | Name, address of child’s school | Allows us to link CCD and EDEN/EDFacts data for specific schools |
| <i>School Features</i> | CCD measures: # of students, teacher/student ratio, percentage of students receiving free or reduced-price lunch | CCD provides administrative data about schools |
| | EDEN/EDFacts: Student achievement | EDEN/EDFacts provides performance data about school systems and individual schools |
| Covariates/Mediators/Moderators | | |
| <i>Child’s Background</i> | Child’s gender, age, race, ethnicity | Child-level covariates used to remove bias in outcome models |
| <i>PCG’s Background</i> | PCG gender, age, race, ethnicity | PCG-level covariates used to remove bias in outcome models |
| | PCG’s education, occupation, employment earnings, debts and assets, marital status | |
| <i>Household Composition</i> | Household composition: number of people and their relationships to the PCG and to the child | |
| <i>PCG Socioemotional</i> | PCG’s mental health | PROMIS: measures PCG’s signs of anxiety and depression |
| | Parenting stress | Challenges to Parenting |
| <i>PCG Health</i> | PCG self-report of overall health | Widely used health measure |
| | Specific health issues (asthma, diabetes, hypertension, heart condition) | Has doctor ever told PCG that he/she had each specific illness/health issue? |

| <i>Domain</i> | <i>Measures</i> | <i>Description</i> |
|-------------------------------|---|--|
| | Physical limitations (for example, walking, climbing stairs, 2 hours of physical activity) | Used to assess severity of any physical or mental health issues that limit play or school |
| | PCG's sleep pattern/problems | PROMIS |
| | PCG dried blood spots: HbA1c, IL-6, CRP | Collected ONLY for the voucher sample—Measures of glucose, inflammation, and stress |
| | PCG's cigarette and alcohol use | |
| | PCG blood pressure | |
| <i>Family Processes</i> | Family routine | The Family Routine Inventory measures how much parents organize children's daily life |
| | Parent provision of stimulation and support | HOME |
| | Cognitive sensitivity (Thin slice)\Lego activity | Recently developed measure of how PCG identifies, interprets, and responds to child's cognitive needs when engaged in a joint task |
| | Parent discipline | Parent-Child Conflict Tactics Scale-Short Form: measures maltreatment and neglect of children by PCG |
| <i>Household Expenditures</i> | Household expenditures on children (for example, how much spent last month on medical & dental; childcare & schooling; clothes & shoes; toys, games, & presents; camps & lessons) General household expenditures (for example, how much spent last month on food and transportation) | SAQ questions |

CCD = Common Core of Data. CRP = c-reactive protein. CSHQ = Children's Sleep Habits Questionnaire. EDEN = Education Data Exchange Network. HbA1c = hemoglobin A1C. HOME = Home Observation for Measurement of the Environment. IL-6 = interleukin 6. MTO = Moving to Opportunity. PCG = primary caregiver. PROMIS = Patient-Reported Outcomes Measurement Information System. PSRA = Preschool Self-Regulation Assessment-Assessor Report. SAQ = self-administered questionnaire.

Innovations

Wave 1 included the following innovative protocols:

(1) **Biomarker collection from primary caregivers and children.** Interviewers collected blood spots from primary caregivers and children in the voucher sample to test for interleukin 6, a biomarker for infection and inflammation; C-reactive protein, a biomarker for stress; and glycosylated hemoglobin, a biomarker for blood sugar levels. To our knowledge, no study has collected blood from children in a home-based setting. Response rates were high: 99.4 percent for caregivers and 83 percent for children.

(2) **Child time diary.** A time diary was developed for HCHD to assess how families' use of space in the home promotes or inhibits children's healthy development through daily routines, interactions, and parenting. Primary caregivers completed the diary over two randomly selected days (one weekday and one weekend day). The response rate for the diary was only 35 percent.¹⁷

(3) **Interviewer assessments of parenting.** To assess the sensitivity of the primary caregiver's parenting, interviewers observed caregivers—almost always mothers—and children participating in a Lego activity and coded the quality of the parent-child interaction using a “thin slice” approach (Prime et al., 2015). This innovative method of measuring parent-child interactions provides an alternative to the more labor-intensive behavior coding systems typically used. It relies on a short observation period of approximately 5 minutes and has minimal coding demands of approximately 7 minutes per interaction. To ensure reliability, all interviewers underwent special training and certification. The research team worked closely with the developers of this assessment to adapt the training and application for a large-scale field study.

(4) **Objective measurement of interior square footage.** Interviewers measured the square footage of living space in the home using an electronic laser tape measure. This approach provides an objective measurement of space in the dwelling and will be helpful when analyzing subjective assessments of crowding, privacy, and clutter. Interviewers collected laser tape data from 88 percent of respondents.

Profile of HCHD Wave 1 Voucher Sample

This section describes the voucher sample's characteristics across demographic and socioeconomic backgrounds, housing and neighborhood features and preferences, health, and parenting. As can be gleaned from even a glance at the exhibits in this section, there are very few, if any, differences between treatment and controls. As with any analysis involving multiple comparisons, we would expect some statistically significant differences simply by chance. Almost none of the differences in these tables apply to both sites, and none are so large that they would be significant after accounting for the multiple comparisons. Therefore, these differences are not discussed.

¹⁷Although the response rate was relatively low, the daily diary should provide important exploratory information on families' use of space pertaining to parenting.

Background Characteristics

Exhibits 8–10 provide summary statistics on the background characteristics of primary caregivers, households, and children in the voucher sample. The exhibits present results for the full sample and the two study sites by treatment condition. According to exhibit 8, primary caregivers were, on average, 32 years of age at Wave 1, and almost all were female. The sample reflects the racial and ethnic diversity of the study sites. Approximately 70 percent of primary caregivers self-identified as Black, 13 percent as Hispanic, 12 percent as another race or ethnicity, and 4 percent as White.¹⁸

More than three-fourths of primary caregivers had at least a high school degree, with nearly 50 percent having some college education. Ten percent of primary caregivers were married.

¹⁸ These estimates use mutually exclusive categories.

Exhibit 8. Baseline PCG Summary Statistics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|----------------------------|-----------------|----------------|----------------|-----------------|----------------|----------------|-----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Mean age at baseline (yrs) | 33.4 (9.5) | 33.8 (8.5) | 33.6 (9.0) | 30.9 (7.8) | 31.6 (8.0) | 31.2 (7.9) | 32.1 (8.7) | 32.6 (8.3) | 32.4 (8.5) |
| Female, % | 97.9* (14.5) | 93.2 (25.2) | 95.6 (20.5) | 94.5 (22.8) | 94.1 (23.7) | 94.3 (23.2) | 96.2 (19.2) | 93.7 (24.4) | 94.9 (21.9) |
| Race/Ethnicity, % | | | | | | | | | |
| White non-Hispanic only | 3.9 (19.4) | 5.0 (21.8) | 4.4 (20.6) | 3.3 (18.0) | 4.5 (20.8) | 3.9 (19.4) | 3.6 (18.7) | 4.7 (21.3) | 4.2 (20.0) |
| Black non-Hispanic only | 73.2 (44.4) | 63.5 (48.3) | 68.5 (46.5) | 75.1 (43.3) | 71.1 (45.4) | 73.1 (44.4) | 74.2 (43.8) | 67.4 (46.9) | 70.9 (45.5) |
| Other race/ethnicity | 13.3 (34.1) | 15.8 (36.6) | 14.6 (35.3) | 10.6 (30.8) | 10.0 (30.1) | 10.3 (30.4) | 11.9 (32.4) | 12.8 (33.5) | 12.4 (32.9) |
| Hispanic/Latino | 9.6 (29.6) | 15.9 (36.7) | 12.7 (33.3) | 11.1 (31.4) | 14.4 (35.2) | 12.7 (33.3) | 10.4 (30.5) | 15.1 (35.9) | 12.7 (33.3) |
| Education, % | | | | | | | | | |
| GED or below | 19.0 (39.3) | 19.0 (39.3) | 19.0 (39.3) | 13.2 (34.0) | 16.5 (37.2) | 14.8 (35.6) | 16.0 (36.7) | 17.7 (38.2) | 16.9 (37.5) |
| HS graduate | 29.5 (45.7) | 29.7 (45.8) | 29.6 (45.7) | 40.7 (49.2) | 39.4 (49.0) | 40.1 (49.1) | 35.3 (47.8) | 34.6 (47.6) | 35.0 (47.7) |
| Some college or degree | 51.6 (50.1) | 51.3 (50.1) | 51.4 (50.0) | 46.0 (49.9) | 44.1 (49.8) | 45.1 (49.8) | 48.7 (50.0) | 47.6 (50.0) | 48.2 (50.0) |
| Married, % | 5.8* (23.3) | 13.4 (34.1) | 9.4 (29.3) | 5.5** (22.9) | 14.6 (35.4) | 9.9 (30.0) | 5.6** (23.1) | 14.0 (34.8) | 9.7 (29.6) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

GED = General Educational Development. HCHD = Housing and Children’s Healthy Development. HS = high school. PCG = primary caregiver. Tx = Treatment.

* $p < .05$, ** $p < .01$.

Notes: Within-site differences Means (SD) reflect site- and condition-adjusted sample weightings. Other non-Hispanic/Latino race/ethnicity includes those who were non-Hispanic/Latino and reported American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, “something else,” or multiple races/ethnicities. Hispanic/Latino includes those who reported any race/ethnicity.

Exhibit 9. Baseline Household Summary Statistics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|-----------------------------|----------------|----------------|----------------|-----------------|----------------|----------------|-----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| HH total members | 3.7 (1.4) | 3.9 (1.6) | 3.8 (1.5) | 4.3 (1.8) | 4.5 (1.8) | 4.4 (1.8) | 4.0 (1.6) | 4.2 (1.8) | 4.1 (1.7) |
| HH adult members | 1.6 (0.8) | 1.7 (0.9) | 1.6 (0.8) | 2.0 (1.1) | 2.0 (1.2) | 2.0 (1.2) | 1.8 (1.0) | 1.9 (1.1) | 1.8 (1.0) |
| HH child members | 2.1 (1.0) | 2.3 (1.3) | 2.2 (1.1) | 2.3 (1.4) | 2.5 (1.3) | 2.4 (1.4) | 2.2 (1.2) | 2.4 (1.3) | 2.3 (1.3) |
| Two-parent HH, % | 20.5 (40.4) | 25.9 (43.9) | 23.1 (42.2) | 14.7 (35.5) | 15.1 (35.9) | 14.9 (35.6) | 17.5 (38.1) | 20.3 (40.3) | 18.9 (39.2) |
| Multigenerational HH, % | 16.9 (37.6) | 20.5 (40.5) | 18.6 (39.0) | 34.1 (47.5) | 34.3 (47.6) | 34.2 (47.5) | 25.7 (43.7) | 27.6 (44.7) | 26.6 (44.2) |
| Head HH disability, % | 6.8 (25.2) | 10.2 (30.3) | 8.4 (27.8) | 6.6 (24.9) | 5.5 (22.9) | 6.1 (23.9) | 6.7 (25.0) | 7.8 (26.8) | 7.2 (25.9) |
| Mean annual income, 1,000\$ | 22.6 (17.1) | 23.7 (20.0) | 23.1 (18.6) | 23.8 (20.7) | 25.2 (22.7) | 24.5 (21.7) | 23.2 (19.0) | 24.4 (21.4) | 23.8 (20.2) |
| Income assistance, % | 71.7 (45.2) | 78.1 (41.5) | 74.8 (43.5) | 77.1* (42.1) | 86.5 (34.3) | 81.7 (38.7) | 74.5* (43.7) | 82.4 (38.1) | 78.3 (41.2) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

Disability = permanent or temporary disability. HCHD = Housing and Children’s Healthy Development. HH = household. Multigenerational HH = 3+ generation household. Tx = Treatment .

Within-site differences: * $p < .05$, ** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. Except where noted, results represent percentages. Income assistance indicates receipt of any government assistance (for example, TANF, SNAP, WIC, unemployment benefits, Supplemental Security Income).

Exhibit 10. Baseline Child Summary Statistics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Mean age at baseline (years) | 6.1 (2.4) | 6.5 (2.5) | 6.3 (2.5) | 6.3 (2.3) | 6.3 (2.2) | 6.3 (2.3) | 6.2 (2.4) | 6.4 (2.4) | 6.3 (2.4) |
| Female, % | 45.5 (49.9) | 51.8 (50.1) | 48.5 (50.0) | 48.8 (50.1) | 46.5 (50.0) | 48.8 (50.1) | 47.2 (50.0) | 48.9 (50.0) | 48.0 (50.0) |
| Mobility impairment, % | 8.1 (27.4) | 11.1 (31.4) | 9.5 (29.4) | 9.7 (29.6) | 8.2 (27.5) | 9.0 (28.6) | 9.0 (28.6) | 9.5 (29.4) | 9.2 (29.0) |
| Number places lived since birth | 2.4 (1.2) | 2.6 (1.2) | 2.5 (1.2) | 3.0 (1.2) | 2.8 (1.2) | 3.0 (1.2) | 2.7 (1.2) | 2.7 (1.2) | 2.7 (1.2) |
| <i>N</i> | 305 | 282 | 587 | 329 | 315 | 329 | 634 | 597 | 1231 |

HCHD = Housing and Children’s Healthy Development. Mobility impairment = parent-reported impairment or health problem limiting child mobility. Tx = Treatment .

Within-site differences: * $p < .05$, ** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings.

As shown in exhibit 9, the average household size was four, with roughly two children and two adults. The mean household income was almost \$24,000, slightly below the 2017 poverty line for a family of four in 2017.¹⁹ Not surprising, more than 75 percent of households received income assistance. As shown in exhibit 10, children’s mean age was 6 years. Roughly one-half were boys and one-half were girls. Since birth, children had lived in 2.5 places, on average.

In sum, as expected with randomization, there were very few significant treatment group differences in background characteristics of primary caregivers, households, and children. These findings reinforce the success of the randomization in creating comparable treatment and control groups.

Housing and Neighborhood Characteristics and Perceptions

Exhibit 11 presents three basic housing characteristics of the Wave 1 sample: housing tenure, the type of structure the sample household lived in, and length of residence at the start of HCHD. Again, there are very few differences between treatment and control groups in either site. Differences are limited to the larger share of owners in Cleveland and the greater share of “neither own nor rent” in Dallas, with a 5-percentage-point differential in each case. Differences in structure type between the two sites reflect their different housing stocks. As a result, more than one-half of Cleveland households live in single-family homes, whereas about one-half of Dallas households live in multiunit structures. Cleveland households also lived in their housing units for roughly 2 years longer compared with Dallas households.

Respondents were asked which of three basic residential features—the housing unit, the neighborhood, and the schools—they prioritized. The results are shown in exhibit 12. The large majority of treatment and control groups in both sites placed their highest priority on schools and neighborhoods, with a slight edge to schools over neighborhoods in Dallas.

To better understand respondents’ conception of a “nice” dwelling, interviewers asked respondents to identify the most important features of a “nice apartment or house.” This open-ended question generated seven different individual features.²⁰ The second panel of exhibit 12 shows the four housing dimensions that were selected most often. In descending order based on the overall total column, these were (1) enough space inside the home (93.4 percent); (2) safe and secure (91.7 percent); (3) in good physical condition (91.3 percent); and (4) good heating and plumbing (84.1 percent).²¹ In both sites, at least 80 percent of respondents and typically more than 90 percent mentioned each of these features.

The next segment of the table offers mixed evidence supporting respondents’ high priority on “enough space inside the home.” On average, roughly one-half indicated they did not have

¹⁹ Data from the Assistant Secretary for Planning and Evaluation (ASPE) *U.S. Federal Poverty Guidelines Used to Determine Financial Eligibility for Certain Federal Programs*: <https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/prior-hhs-poverty-guidelines-federal-register-references/2017-poverty-guidelines>.

²⁰ A small share of respondents identified other features, which were combined into an “other” category.

²¹ The denominator for these calculations is the total number of mentions, not respondents.

enough space in their home (the overall average was 49.9 percent). On the other hand, the large majority (84.7 percent), on average, report that their home has a place where their child can read or work without distractions.

Which of these assessments reflect the objective facts about the home? The next panel of data in exhibit 13 suggests that respondents' housing units have roughly six rooms, on average, a person/room ratio of less than one, and an average persons/bedroom that approaches two (1.61). None of these measures provide clear insights into crowding in the home: holding household size constant, a dwelling with many small rooms can be more crowded than one with fewer large rooms. It is also not unusual for young siblings to share a bedroom, but other combinations are potentially problematic.

Exhibit 11. Baseline Residential Characteristics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|-----------------------------|-----------|---------|--------|--------|---------|--------|--------|---------|--------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Own home, % | 9.3* | 14.3 | 11.8 | 10.7 | 13.3 | 12.0 | 9.8* | 14.0 | 11.9 |
| | (29.2) | (35.0) | (32.3) | (31.1) | (34.1) | (32.5) | (29.7) | (34.7) | (32.3) |
| Rent, % | 85.2 | 80.8 | 83.0 | 80.9 | 83.2 | 82.0 | 83.9 | 81.5 | 82.7 |
| | (35.5) | (39.5) | (37.6) | (39.5) | (37.6) | (38.5) | (36.8) | (38.9) | (37.8) |
| Neither own nor rent, % | 5.4 | 4.9 | 5.2 | 8.4* | 3.5 | 6.0 | 6.3 | 4.5 | 5.4 |
| | (22.7) | (21.7) | (22.2) | (27.8) | (18.5) | (23.9) | (24.4) | (20.8) | (22.7) |
| Detached single family, % | 41.6 | 47.3 | 44.4 | 29.3 | 28.1 | 28.7 | 37.9 | 41.5 | 39.7 |
| | (49.4) | (50.0) | (49.7) | (45.7) | (45.1) | (45.3) | (48.6) | (49.3) | (48.9) |
| Attached single family, % | 7.5 | 4.5 | 6.0 | 4.7 | 4.8 | 4.8 | 6.7 | 4.6 | 5.6 |
| | (26.4) | (20.7) | (23.8) | (21.3) | (21.5) | (21.3) | (24.9) | (20.9) | (23.1) |
| 2–4 unit structure, % | 24.6 | 20.7 | 22.7 | 2.7 | 3.4 | 3.0 | 17.9 | 15.5 | 16.7 |
| | (43.1) | (40.6) | (41.9) | (16.2) | (18.3) | (17.2) | (38.3) | (36.3) | (37.3) |
| Single apt. building, % | 6.9 | 6.9 | 6.9 | 24.8 | 32.3 | 28.5 | 12.4 | 14.5 | 13.4 |
| | (25.4) | (25.4) | (25.4) | (43.4) | (47.0) | (45.2) | (33.0) | (35.2) | (34.1) |
| Housing complex, % | 18.3 | 20.1 | 19.2 | 31.2 | 23.5 | 27.5 | 22.3 | 21.1 | 21.7 |
| | (38.7) | (40.1) | (39.4) | (46.5) | (42.6) | (44.7) | (41.6) | (40.8) | (41.2) |
| Shelter/homeless, % | .4 | 0 | .2 | 1.6 | 1.1 | 1.3 | .7 | .3 | .5 |
| | (6.2) | (0) | (4.4) | (12.5) | (10.4) | (11.5) | (8.4) | (5.7) | (7.3) |
| Other, % | .7 | .6 | .6 | 5.7 | 6.7 | 6.2 | 2.2 | 2.4 | 2.3 |
| | (8.1) | (7.9) | (8.0) | (23.3) | (25.1) | (24.1) | (14.7) | (15.4) | (15.1) |
| Length of residence (years) | 5.07 | 4.98 | 5.03 | 3.37 | 2.90 | 3.14 | 4.54 | 4.34 | 4.44 |
| | (6.17) | (6.85) | (6.50) | (5.36) | (3.89) | (4.69) | (5.97) | (6.16) | (6.06) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

HCHD = Housing and Children’s Healthy Development. Tx = Treatment .

Within-site differences: * $p < .1$, ** $p < .05$, *** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. Cases reporting less than 1 year in home set to .5 years.

Exhibit 12. Baseline Preferences of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|--|----------------|----------------|----------------|-----------------|----------------|----------------|-----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Most important feature, % | | | | | | | | | |
| Nice home | 14.9 (35.6) | 13.6 (34.4) | 14.3 (35.0) | 18.7 (39.1) | 19.9 (40.1) | 19.3 (39.5) | 16.1 (36.7) | 15.5 (36.2) | 15.8 (36.5) |
| Good neighborhood | 41.7 (49.4) | 42.1 (49.4) | 41.9 (49.4) | 33.3 (47.3) | 37.5 (48.9) | 35.3 (47.9) | 39.1 (48.9) | 40.7 (49.2) | 39.9 (49.0) |
| Good schools | 43.4 (49.6) | 44.3 (49.8) | 43.9 (49.7) | 48.0 (50.1) | 42.6 (49.6) | 45.4 (49.9) | 44.8 (49.8) | 43.8 (49.7) | 44.3 (49.7) |
| Most important features of a “nice apt or house,” % | | | | | | | | | |
| Enough space inside home | 95.1 (21.7) | 93.0 (25.6) | 94.0 (23.7) | 89.6 (30.7) | 94.3 (23.3) | 91.8 (27.4) | 93.4 (24.9) | 93.4 (24.9) | 93.4 (24.9) |
| Safe & secure | 90.6 (29.2) | 93.9 (23.9) | 92.2 (26.8) | 92.5 (26.5) | 88.0 (32.6) | 90.3 (29.6) | 91.2 (28.4) | 92.2 (26.9) | 91.7 (27.7) |
| Good physical condition (fresh paint, no holes, etc.) | 93.7 (24.3) | 91.8 (27.4) | 92.8 (25.9) | 89.7 (30.5) | 86.0 (34.8) | 87.9 (32.7) | 92.5 (26.4) | 90.1 (29.9) | 91.3 (28.2) |
| Good heating & plumbing | 87.2 (33.4) | 84.0 (36.7) | 85.7 (35.1) | 84.4* (36.4) | 76.1 (42.8) | 80.4 (39.8) | 86.3* (34.4) | 81.7 (38.7) | 84.1 (36.6) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

HCHD = Housing and Children’s Healthy Development. Tx = Treatment.

Within-site differences: * $p < .1$, ** $p < .05$, *** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. “Most Important Features” lists the top four responses (multiple responses allowed).

Exhibit 13. Baseline Space and Crowding of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Have enough space, % | | | | | | | | | |
| More than enough | 20.4** (40.4) | 13.5 (34.2) | 17.0 (37.6) | 12.2 (32.8) | 7.9 (27.1) | 10.1 (30.2) | 17.9** (38.4) | 11.8 (32.3) | 14.9 (35.6) |
| Just enough | 34.0 (47.5) | 39.3 (48.9) | 36.6 (48.2) | 32.3 (46.9) | 31.7 (46.7) | 32.1 (46.7) | 33.5 (47.3) | 37.0 (48.3) | 35.2 (47.8) |
| Not enough | 45.5 (49.9) | 47.3 (50.0) | 46.4 (49.9) | 55.5 (49.9) | 60.3 (49.1) | 57.8 (49.5) | 48.6 (50.0) | 51.2 (50.0) | 49.9 (50.0) |
| Have place where child can read, work w/o distractions, % | 86.5 (34.3) | 87.5 (33.1) | 87.0 (33.7) | 78.3 (41.4) | 80.4 (39.9) | 79.3 (40.6) | 84.0 (36.7) | 85.4 (35.4) | 84.7 (36.1) |
| # rooms | 6.02** (1.69) | 6.40 (1.98) | 6.21 (1.85) | 5.33 (1.67) | 5.32 (1.58) | 5.33 (1.62) | 5.81** (1.71) | 6.08 (1.93) | 5.94 (1.83) |
| # bedrooms | 2.78** (.86) | 2.97 (.95) | 2.87 (.91) | 2.32 (.91) | 2.37 (.86) | 2.34 (.88) | 2.64 (.90) | 2.79 (.97) | 2.71 (.94) |
| Persons per room | .66 (.33) | .65 (.60) | .66 (.30) | .88 (.47) | .88 (.38) | .88 (.43) | .73 (.39) | .72 (.32) | .72 (.36) |
| Persons per bedroom | 1.41 (.57) | 1.41 (.61) | 1.41 (.59) | 2.08 (1.11) | 2.07 (1.06) | 2.08 (1.08) | 1.62 (.84) | 1.61 (.83) | 1.61 (.83) |
| Total square footage | 910.6 (355.1) | 905.9 (343.4) | 908.3 (349.0) | 747.0 (313.3) | 774.9 (310.1) | 760.5 (311.4) | 862.8 (351.0) | 868.9 (339.1) | 865.0 (345.) |
| Square feet/person | 262.9 (114.3) | 256.9 (124.3) | 259.9 (119.4) | 200.6 (94.3) | 202.1 (94.0) | 201.3 (93.9) | 244.7 (112.4) | 241.5 (119.1) | 243.1 (115.7) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

Avg # rooms = bedrooms + other rooms (excludes bathrooms). Avg # persons per bedroom = total number of persons in household/total number of bedrooms.
 Avg # persons per room = total number of persons in household/total number of rooms (excluding bathrooms). HCHD = Housing and Children’s Healthy Development. Tx = Treatment .

Notes: Within-site differences * p < .1, ** p < .05, *** p < .01. Means (SD) reflect site- and condition-adjusted sample weightings.

A more objective measure of space is the dwelling's square footage, and a more precise measure of crowding in the dwelling is square footage/person. These data are shown in the last two entries in the exhibit and provide stronger evidence for respondents' perceptions of inadequate space in the home. On average, the voucher sample's housing units are relatively small at 865 square feet.²² As a crude approximation, this translates into 144 square feet/room in the average dwelling (865 total square feet divided by 5.94 rooms). Units in Cleveland are 150 square feet larger than those in Dallas, consistent with the large fraction of respondents in Cleveland who live in single-family homes, whereas Dallas respondents are much more likely to live in a multiunit apartment.

Beyond limited square footage, dwellings were also likely to feel crowded. The average square footage per person was about 245, roughly 100 square feet less than in assisted housing units, according to the 2017 American Housing Survey (Newman and Holupka, 2021).

As shown in exhibit 14, roughly 65 percent of the voucher sample indicated that they were "very satisfied" or "satisfied" with their neighborhood. Similar to the question about what features define a "nice apartment or house," we also asked an open-ended question about what the respondent viewed as the most important features of a good neighborhood. Again, the question generated seven individual features plus an "other" category. The most frequently mentioned attributes, shown in descending order by the total column, are (1) safety (97.1 percent); (2) good schools (91.1 percent); (3) good neighbors (81.1 percent); and (4) not a lot of noise (61 percent).

²² A recent analysis of the 2015 and 2017 American Housing Surveys reports that assisted housing units across the United States average more than 1,000 square feet.

Exhibit 14. Baseline Neighborhood Characteristics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|--|------------------|----------------|----------------|----------------|----------------|----------------|------------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Satisfied w/neighborhood, % | | | | | | | | | |
| Very satisfied | 15.1 (35.9) | 12.3 (32.9) | 13.7 (34.4) | 18.3 (38.8) | 15.5 (36.3) | 16.9 (37.6) | 16.1 (36.8) | 13.2 (33.9) | 14.7 (35.4) |
| Satisfied | 47.6 (50.0) | 49.8 (50.1) | 48.7 (50.0) | 52.0 (50.1) | 55.7 (49.9) | 53.4 (49.9) | 49.0 (50.0) | 51.5 (50.0) | 50.2 (50.0) |
| Dissatisfied | 25.3 (43.4) | 24.2 (42.9) | 24.8 (43.2) | 22.4 (41.9) | 20.7 (40.6) | 21.5 (41.2) | 24.4 (43.0) | 23.1 (42.2) | 23.8 (42.6) |
| Very dissatisfied | 11.9 (32.5) | 13.7 (34.5) | 12.8 (33.5) | 7.3 (26.7) | 8.1 (27.4) | 7.7 (26.7) | 10.5 (30.7) | 12.1 (32.6) | 11.3 (31.7) |
| Most important features of a "good neighborhood," % | | | | | | | | | |
| Safety | 98.6* (11.9) | 96.2 (19.0) | 97.4 (15.9) | 96.5 (18.4) | 96.5 (18.4) | 96.5 (18.4) | 97.9 (14.2) | 96.3 (18.8) | 97.1 (16.6) |
| Good schools | 93.7** (24.4) | 88.8 (31.6) | 91.3 (28.3) | 90.4 (29.6) | 91.2 (28.4) | 90.8 (28.9) | 92.7 (26.1) | 89.5 (30.7) | 91.1 (28.5) |
| Good neighbors | 85.6 (35.2) | 82.8 (37.8) | 84.2 (36.5) | 72.7 (44.7) | 75.5 (43.2) | 74.0 (43.9) | 81.6 (38.8) | 80.6 (39.6) | 81.1 (39.2) |
| Not a lot of noise | 63.3 (48.3) | 57.2 (50.0) | 60.3 (49.0) | 64.4 (48.0) | 60.9 (49.0) | 62.7 (48.5) | 63.7 (48.2) | 58.3 (49.4) | 61.0 (48.2) |
| Feel safe outside home, % | | | | | | | | | |
| Very safe | 22.3 (41.7) | 23.1 (42.2) | 22.7 (21.9) | 26.1 (44.1) | 21.9 (41.5) | 24.1 (42.8) | 23.4 (42.4) | 22.7 (41.9) | 23.1 (42.2) |
| Safe | 58.8 (49.3) | 55.0 (49.8) | 56.9 (49.6) | 61.1 (48.9) | 63.7 (48.3) | 62.4 (48.5) | 59.6 (49.1) | 57.6 (49.5) | 58.6 (49.3) |
| Unsafe | 11.8** (32.3) | 17.5 (38.1) | 14.6 (35.4) | 10.8 (31.1) | 13.9 (34.7) | 12.3 (32.9) | 11.5** (31.9) | 16.4 (37.1) | 13.9 (34.6) |
| Very unsafe | 7.1 (25.8) | 4.4 (20.5) | 5.8 (23.3) | 1.8 (13.4) | .6 (7.8) | 1.2 (11.1) | 5.5 (22.8) | 3.3 (17.8) | 4.4 (20.5) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

Exhibit 14. Baseline Neighborhood Characteristics of Voucher Sample by Site, HCHD (cont'd)

| | Cleveland | | | Dallas | | | Total | | |
|-----------------------------|------------------|----------------|----------------|----------------|----------------|----------------|------------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Feel safe during the day, % | | | | | | | | | |
| Very safe | 20.4 (40.4) | 25.1 (43.4) | 22.6 (41.9) | 26.9 (44.5) | 28.2 (45.2) | 27.6 (49.8) | 22.4 (41.7) | 26.1 (43.9) | 24.1 (42.8) |
| Safe | 54.2 (49.9) | 55.0 (49.8) | 54.6 (49.8) | 57.4 (49.6) | 59.1 (49.4) | 58.3 (49.4) | 55.2 (49.8) | 56.3 (50.0) | 55.7 (49.7) |
| Unsafe | 19.2** (39.5) | 13.0 (33.7) | 16.3 (37.) | 12.1 (32.7) | 11.4 (31.9) | 11.8 (32.3) | 17.1* (37.7) | 12.5 (33.1) | 14.9 (35.6) |
| Very unsafe | 6.1 (24.0) | 6.9 (25.4) | 6.5 (24.7) | 3.5 (18.6) | 1.2 (11.1) | 2.4 (15.4) | 5.4 (22.5) | 5.1 (22.1) | 5.3 (22.3) |
| Feel safe at night, % | | | | | | | | | |
| Very safe | 12.7** (33.4) | 6.9 (25.4) | 10.0 (30.0) | 16.2 (37.0) | 13.5 (34.4) | 14.9 (35.7) | 13.8** (34.5) | 9.0 (28.6) | 11.5 (31.9) |
| Safe | 40.9 (49.3) | 47.5 (50.0) | 44.0 (49.7) | 43.2 (49.7) | 45.3 (50.0) | 44.2 (49.8) | 41.6 (49.3) | 46.8 (50.0) | 44.1 (49.7) |
| Unsafe | 25.8 (43.8) | 24.3 (43.0) | 25.1 (43.4) | 28.7 (45.4) | 27.2 (44.7) | 28.0 (45.0) | 26.7 (44.3) | 25.2 (43.5) | 26.0 (43.9) |
| Very unsafe | 20.5 (40.5) | 21.3 (41.0) | 20.9 (40.7) | 11.9 (32.5) | 13.9 (34.8) | 12.9 (33.6) | 17.9 (38.4) | 19.0 (39.3) | 18.4 (38.8) |
| Bothered by street noise, % | 31.0** (46.3) | 40.9 (49.3) | 35.7 (47.9) | 31.6 (46.7) | 25.6 (43.8) | 28.7 (45.3) | 31.2 (46.4) | 36.1 (48.1) | 33.5 (47.2) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

HCHD = Housing and Children's Healthy Development. Tx = Treatment .

Within-site differences: * $p < .1$. ** $p < .05$. *** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings.

Given the importance to respondents of safety in the neighborhood, it is not surprising that the large majority of the voucher sample consider their most proximate neighborhood—that is, the area immediately surrounding their home—to be very safe or safe (81.7 percent). Nearly the same fraction (79.8 percent) felt very safe or safe during the day when asked to think about the safety of the several blocks or streets in each direction from their home. This rate drops by more than 25 percentage points (55.6 percent) when asked how safe they felt in this several-block neighborhood at night.

As the exhibit shows, “not a lot of noise” was the fourth most often mentioned feature of a good neighborhood. Overall, approximately one-third (33.5 percent) of respondents indicated that they were bothered by street noise in their current neighborhood.

Beyond asking for respondents’ assessments of their housing unit and neighborhood in general, HCHD also explored their perceptions of what they liked most and least about where they lived *for their child*. Those questions were asked as open-ended questions and generated nine response categories plus a 10th “other” code. The results are shown in exhibit 15 and, again, are listed in descending order of frequency. The modal response was having a safe and secure home, with more than two-thirds of respondents (67.9 percent) stating this as a priority. Nearly 60 percent (58.5 percent) mentioned having enough space inside the home where the child could read or do homework. The subsequent three features generated similar rates: having enough inside play space for the child (53.4 percent), liking the school the child attends (52.5 percent), and being in a location that is convenient to family (52.6 percent).

The bottom panel of the exhibit presents the inverse—namely, what parents like least about where they live for their child. Three features had nearly the same rate of mentions: no safe place for children to play outside (37.3 percent), no space inside for children to play (35.6 percent), and not convenient to family (35.3 percent). On average, 28.3 percent of mentions indicated that the home’s safety and security were lacking.

Exhibit 15. Baseline: Voucher Sample Reported Like Most/Least About Where You Live for Your Child(ren) by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|--|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Like MOST about where you live for your child(ren), % | | | | | | | | | |
| Home safe & secure | 69.5 (46.1) | 65.2 (47.7) | 67.5 (46.9) | 69.3 (46.3) | 68.1 (46.8) | 68.7 (46.4) | 69.5 (46.1) | 66.1 (47.3) | 67.9 (46.7) |
| Space inside to work | 63.2 (48.3) | 59.7 (49.1) | 61.5 (48.7) | 56.3 (49.8) | 46.3 (50.1) | 51.5 (50.1) | 61.1 (48.8) | 55.1 (49.8) | 58.5 (49.3) |
| Space inside to play | 60.1 (49.0) | 57.5 (49.5) | 58.9 (49.2) | 44.5 (50.) | 37.2 (48.5) | 40.9 (49.3) | 55.5 (49.8) | 51.1 (50.0) | 53.4 (49.9) |
| Convenient to family | 50.8 (50.1) | 51.2 (50.1) | 51.0 (50.0) | 54.7 (50.0) | 58.3 (49.5) | 56.5 (49.7) | 51.9 (50.0) | 53.4 (49.9) | 52.6 (49.9) |
| Like child's school | 50.4 (50.1) | 52.2 (50.0) | 51.3 (50.) | 59.5 (49.3) | 51.3 (50.2) | 55.5 (49.8) | 53.1 (50.0) | 51.9 (50.0) | 52.5 (50.0) |
| Like LEAST about where you live for your child(ren), % | | | | | | | | | |
| No safe place outside to play | 32.2 (46.8) | 35.6 (48.0) | 33.8 (47.3) | 43.1 (49.7) | 47.5 (50.1) | 45.2 (49.9) | 35.5 (47.9) | 39.3 (48.9) | 37.3 (48.4) |
| No space inside to play | 32.3 (46.8) | 31.9 (46.7) | 32.1 (46.7) | 40.7 (49.3) | 46.5 (50.1) | 43.5 (49.7) | 34.8 (47.7) | 36.5 (49.2) | 35.6 (47.9) |
| Not convenient to family | 40.7 (49.2) | 38.1 (48.7) | 39.5 (48.9) | 25.8 (43.9) | 25.8 (43.9) | 25.8 (43.8) | 36.3 (48.1) | 34.3 (47.5) | 35.3 (47.8) |
| Home not safe & secure | 26.7* (44.3) | 33.6 (47.3) | 29.9 (45.8) | 25.8 (43.9) | 23.5 (42.5) | 24.7 (43.2) | 26.4 (44.1) | 30.4 (46.1) | 28.3 (45.1) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

HCHD = Housing and Children's Healthy Development. Tx = Treatment .

Within-site differences * $p < .1$. ** $p < .05$. *** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. All questions from self-administered questionnaire.

Health

Exhibits 16 and 17 present summary statistics on adults' (that is, primary caregivers') and children's health, respectively. Primary caregivers, on average, reported "good" overall health, with results based on binary measures similar (for example, more than 70 percent of caregivers reported "good" health or better).

By contrast with generally favorable reports of overall health, the majority of caregivers—60 percent—were obese based on measurements of their height and weight during the home visit. Their average blood pressure, as measured by interviewers during the home visit, was within the normal range. The most prevalent health conditions reported by caregivers were hypertension (18 percent) and asthma (16 percent).

More than three-fourths of caregivers had health insurance through either private or public sources. Insurance coverage varied somewhat by site; 94 percent of Cleveland caregivers had insurance, whereas the rate was only 63 percent in Dallas.

Concerning mental health, caregivers reported relatively infrequent signs of both anxiety and depression on the Patient-Reported Outcomes Measurement Information System (PROMIS) measures. They also reported moderate levels of overall stress.

Exhibit 16. Baseline PCG Health Summary Statistics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Overall health (1–5) | 3.3 (1.1) | 3.1 (1.2) | 3.2 (1.1) | 3.2 (1.1) | 3.1 (1.1) | 3.1 (1.1) | 3.2 (1.1) | 3.1 (1.1) | 3.2 (1.1) |
| Binary health cut-offs, % | | | | | | | | | |
| Very good health or better | 39.8 (49.1) | 34.7 (47.7) | 37.3 (48.4) | 39.5 (49.0) | 34.6 (47.7) | 37.1 (48.4) | 39.7 (49.0) | 34.6 (47.6) | 37.2 (48.4) |
| Good health or better | 73.6 (44.2) | 66.8 (47.2) | 70.3 (45.7) | 67.9 (46.8) | 73.0 (44.5) | 70.4 (45.7) | 70.7 (45.6) | 70.0 (45.9) | 70.4 (45.7) |
| Fair health or better | 97.4* (16.0) | 92.2 (26.9) | 94.9 (22.1) | 95.8 (20.0) | 92.0 (27.2) | 94.0 (23.8) | 96.6* (18.2) | 92.1 (27.0) | 94.4 (23.0) |
| BMI, kg/m2 | 33.7 (9.5) | 33.9 (7.7) | 33.8 (8.7) | 32.5 (9.2) | 33.4 (9.6) | 32.5 (9.2) | 33.1 (9.4) | 33.6 (8.7) | 33.4 (9.0) |
| Underweight, % | 0.7 (8.4) | 0.4 (6.0) | 0.5 (7.3) | 2.8 (16.5) | 1.2 (10.9) | 2.0 (14.0) | 1.8 (13.2) | 0.8 (8.9) | 1.3 (11.3) |
| Normal weight, % | 12.2 (32.8) | 11.3 (31.7) | 11.8 (32.3) | 20.6 (40.5) | 20.8 (40.6) | 20.7 (40.5) | 16.5 (37.1) | 16.2 (36.9) | 16.3 (37.0) |
| Overweight, % | 28.2 (45.1) | 22.3 (41.7) | 25.4 (43.6) | 19.1 (39.4) | 19.7 (39.9) | 19.4 (39.6) | 23.6 (42.5) | 21.0 (40.8) | 22.3 (41.7) |
| Obese, % | 58.9 (49.3) | 66.0 (47.5) | 62.3 (48.5) | 57.5 (49.5) | 58.3 (49.4) | 57.9 (49.4) | 58.2 (49.4) | 62.1 (48.6) | 60.1 (49.0) |
| Class 1 obese | 18.0 (38.5) | 28.5 (45.3) | 23.1 (42.2) | 23.1 (42.3) | 18.6 (39.0) | 20.9 (40.7) | 20.6 (40.5) | 23.4 (42.4) | 22.0 (41.4) |
| Class 2 obese | 19.0 (39.3) | 15.0 (35.8) | 17.1 (37.7) | 12.7 (33.4) | 14.0 (34.7) | 13.3 (34.0) | 15.8 (36.5) | 14.5 (35.2) | 15.2 (35.9) |
| Class 3 obese | 21.8 (41.4) | 22.5 (41.8) | 22.1 (41.6) | 21.6 (41.3) | 25.8 (43.8) | 23.7 (42.5) | 21.7 (41.3) | 24.2 (42.9) | 22.9 (42.1) |
| Avg. diastolic pressure, mmHg | 80.4 (11.7) | 81.8 (14.1) | 81.0 (12.9) | 80.4 (12.2) | 81.0 (12.4) | 80.7 (12.3) | 80.4 (11.9) | 81.4 (13.2) | 80.9 (12.6) |
| Avg. systolic pressure, mmHg | 119.6 (18.6) | 119.9 (19.8) | 119.8 (19.2) | 116.8 (16.0) | 117.5 (17.7) | 117.2 (16.8) | 118.2 (17.4) | 118.7 (18.8) | 118.4 (18.1) |
| Health conditions, % | | | | | | | | | |

| | Cleveland | | | Dallas | | | Total | | |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Asthma | 21.0 (40.8) | 19.3 (39.5) | 20.1 (40.2) | 14.5 (35.2) | 10.2 (30.3) | 12.4 (33.0) | 17.6 (38.2) | 14.6 (35.4) | 16.2 (36.8) |
| Diabetes | 6.0 (23.8) | 9.5 (29.4) | 7.7 (26.7) | 4.8 (21.4) | 3.5 (18.5) | 4.2 (20.0) | 5.4 (22.6) | 6.4 (24.6) | 5.9 (23.6) |
| Hypertension | 16.1 (36.8) | 17.9 (38.4) | 16.9 (37.5) | 19.0 (39.3) | 20.4 (40.4) | 19.7 (39.8) | 17.5 (38.1) | 19.1 (39.4) | 18.3 (38.7) |
| Heart disease | 4.9 (21.5) | 4.2 (20.0) | 4.5 (20.8) | 3.5 (18.4) | 7.8 (26.8) | 5.6 (23.0) | 4.2 (20.0) | 6.0 (23.8) | 5.1 (21.9) |
| Have health insurance, % | 94.7 (22.4) | 93.4 (24.8) | 94.1 (23.6) | 58.8 (49.3) | 67.1 (47.1) | 62.9 (48.4) | 76.5 (42.5) | 79.9 (40.1) | 78.1 (41.4) |
| Heavy exercise, days/week | 1.4 (2.4) | 1.5 (2.3) | 1.4 (2.4) | 1.3 (1.8) | 1.5 (1.9) | 1.4 (1.8) | 1.3 (2.1) | 1.5 (2.1) | 1.4 (2.1) |
| Light exercise, days/week | 3.2 (3.2) | 2.9 (3.2) | 3.0 (3.2) | 3.0* (3.1) | 2.4 (2.4) | 2.7 (2.8) | 3.1* (3.2) | 2.7 (2.8) | 2.9 (3.0) |
| Emotional distress | | | | | | | | | |
| Anxiety (1–5) | 2.1 (1.0) | 2.1 (0.9) | 2.1 (1.0) | 2.2 (0.9) | 2.2 (0.9) | 2.2 (0.9) | 2.2 (1.0) | 2.2 (0.9) | 2.2 (0.9) |
| Depression (1–5) | 1.8 (1.0) | 1.8 (0.9) | 1.8 (0.9) | 1.9 (1.0) | 1.9 (1.0) | 1.9 (1.0) | 1.9 (1.0) | 1.9 (0.9) | 1.9 (0.9) |
| Global stress (1–5) | 2.5 (0.9) | 2.5 (0.8) | 2.5 (0.8) | 2.6 (0.9) | 2.6 (0.8) | 2.6 (0.8) | 2.5 (0.9) | 2.5 (0.8) | 2.5 (0.8) |
| <i>N</i> | 226 | 211 | 437 | 235 | 223 | 458 | 461 | 434 | 895 |

BMI = body mass index. HCHD = Housing and Children’s Healthy Development. PCG = primary caregiver. Tx = Treatment .

Within-site differences * $p < .05$, ** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. BMI categories based on CDC clinical guidelines (<https://www.cdc.gov/obesity/adult/defining.html>). Obesity categorized into three classes of severity. Blood pressure ranges assessed on the basis of American Heart Association guidelines, with diastolic < 80 and systolic < 120 considered normal (<https://www.heart.org/en/health-topics/high-blood-pressure/understanding-blood-pressure-readings>). Heavy and light exercise measured parent-reported weekly leisure-time physical activity. Health insurance includes private insurance through an employer, Medicaid, private insurance through Ohio/Texas Health Insurance Marketplace, the Affordable Care Act (or Obamacare), or other. Emotional distress measured adults’ feelings or emotions over the past 7 days, with subscales for average anxiety and depression (four

items each: 1 “never” to 5 “always”); similar results were found using anxiety and depression t-scores obtained from the PROMIS online scoring system (Cella et al., 2007; Pilkonis et al., 2011, 2014). Global stress (four items: 1 “never” to 5 “very often”) measured average perceived stress (Cohen and Williamson, 1988).

Exhibit 17. Baseline Child Health Summary Statistics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|----------------------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Overall health (1–5) | 4.2** (0.9) | 4 (1.0) | 4.1 (1.0) | 4.2 (1.0) | 4.2 (0.9) | 4.2 (1.0) | 4.2* (1.0) | 4.1 (1.0) | 4.2 (1.0) |
| Binary health cut-offs, % | | | | | | | | | |
| Very good health or better | 78.7** (41.0) | 68.7 (46.4) | 73.9 (43.9) | 72.8 (44.6) | 77.6 (41.8) | 75.1 (43.3) | 75.6 (43.0) | 73.5 (44.1) | 74.6 (43.6) |
| Good health or better | 93.6 (24.6) | 92.1 (27.0) | 92.9 (25.8) | 92.3 (26.7) | 94.3 (23.2) | 93.3 (25.0) | 92.9 (25.7) | 93.3 (25.0) | 93.1 (25.4) |
| Fair health or better | 99.0 (10.1) | 98.0 (14.1) | 98.5 (12.2) | 99.4 (7.9) | 99.8 (4.4) | 99.6 (6.4) | 99.2 (9.0) | 99.0 (10.1) | 99.1 (9.5) |
| Health conditions, % | | | | | | | | | |
| Severe allergies | 0.9 (9.7) | 2.2 (14.6) | 1.5 (12.3) | 2.0 (14.0) | 2.8 (16.6) | 2.0 (14.0) | 1.5 (12.2) | 2.5 (15.7) | 2.0 (14.0) |
| Asthma | 28.1 (45.0) | 27.1 (44.5) | 27.6 (44.8) | 30.4 (46.1) | 25.8 (43.8) | 30.4 (46.1) | 29.3 (45.6) | 26.4 (44.1) | 27.9 (44.9) |
| Nighttime coughing | 10.1 (30.2) | 12.6 (33.2) | 11.3 (31.7) | 22.4 (41.8) | 20.3 (40.3) | 22.4 (41.8) | 16.6 (37.2) | 16.8 (37.4) | 16.7 (37.3) |
| Diabetes | 0.4 (6.1) | 0.2 (4.5) | 0.3 (5.3) | 0.6 (7.8) | 0.0 (0.0) | 0.6 (7.8) | 0.5 (7.1) | 0.1 (3.0) | 0.3 (5.5) |
| BPI total (0–56) | 14.6 (8.8) | 15.5 (8.6) | 15.0 (8.7) | 14.3 (10.0) | 14.2 (8.8) | 14.3 (9.4) | 14.5 (9.4) | 14.8 (8.7) | 14.6 (9.1) |
| Externalizing (0–36) | 11.4 (6.8) | 11.5 (6.6) | 11.4 (6.7) | 10.8 (7.5) | 10.7 (6.7) | 10.7 (7.1) | 11.1 (7.2) | 11.1 (6.7) | 11.1 (6.9) |
| Internalizing (0–20) | 3.3** (2.7) | 4.0 (3.0) | 3.6 (2.9) | 3.6 (3.1) | 3.6 (2.7) | 3.6 (3.0) | 3.4 (2.9) | 3.8 (2.9) | 3.6 (2.9) |
| Anxious/depressed (0–10) | 1.9** (1.5) | 2.4 (1.8) | 2.1 (1.7) | 2.0 (1.8) | 2.1 (1.8) | 2.1 (1.8) | 2.0** (1.7) | 2.3 (1.8) | 2.1 (1.7) |
| Headstrong (0–10) | 3.5 (2.5) | 3.7 (2.3) | 3.6 (2.4) | 3.4 (2.6) | 3.2 (2.3) | 3.3 (2.5) | 3.5 (2.5) | 3.5 (2.3) | 3.5 (2.4) |
| Antisocial (0–12) | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 |

| | Cleveland | | | Dallas | | | Total | | |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Hyperactive (0–10) | (2.1) 3.4 | (2.2) 3.3 | (2.2) 3.3 | (2.3) 3.1 | (2.1) 3.3 | (2.2) 3.2 | (2.2) 3.2 | (2.1) 3.3 | (2.2) 3.3 |
| Peer problems (0–6) | (2.4) 0.6 | (2.5) 0.7 | (2.4) 0.6 | (2.8) 0.6 | (2.5) 0.5 | (2.6) 0.6 | (2.6) 0.6 | (2.5) 0.6 | (2.5) 0.6 |
| <i>N</i> | (0.9) 304 | (1.1) 282 | (1.0) 586 | (1.1) 329 | (1.0) 314 | (1.0) 643 | (1.0) 633 | (1.1) 596 | (1.0) 1229 |

BPI = Behavior Problems Index. HCHD = Housing and Children’s Healthy Development. Tx = Treatment .

Within-site differences * $p < .05$, ** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. BPI (28 items: 0 “not true” to 2 “often true”) measures parent-reported incidence and severity of child behavior problems; all scale scores are sums. Externalizing: BPI subscale (18 items: for example, argues too much, high strung). Internalizing: BPI subscale (10 items: for example, fearful or anxious, easily confused). Anxious/depressed: BPI subproblem score (5 items: for example, unhappy, sad, or depressed). Headstrong: BPI subproblem score (5 items: for example, argues a lot, strong/hot temper). Antisocial: BPI subproblem score (6 items: for example, lies and cheats, teases others a lot or is cruel/mean to others). Hyperactive: BPI subproblem score (5 items: for example, impulsive, difficulty concentrating). Peer problems: BPI subproblem score (3 items: for example, difficulty getting along with others, withdrawn).

Primary caregivers reported that children, on average, had “very good” overall health, with more than three-fourths reporting their children’s overall health as “very good” or better. In terms of health conditions, more than one-fourth of children had asthma, and one-sixth had nighttime coughing, which is related to asthma and other upper respiratory conditions.

Average scores on primary caregiver-reported child behavior problems were generally low; the average score was about 15 out of a possible range of 0–56. Primary caregivers reported that children had more externalizing (for example, aggression, acting out) than internalizing (for example, depression, withdrawn) problems, with scores of 11 and 4, respectively.

In short, primary caregivers and children both reported overall good health and few signs of mental health problems; however, rates of adult obesity and child asthma are high.

Parenting

Exhibit 18 provides summary statistics on parent-child interactions. Primary caregivers reported moderate levels of parenting stress, with scores at the midpoint of the scale. The mean number of overall family routines (bedtime, breakfast, and dinner time) was two. Approximately three-fourths of families reported having regular bedtimes for children and family dinners at least three days per week or more. Interviewer observations of parental warmth, lack of hostility, and verbal skills were moderate to high.

Exhibit 18. Baseline Parent-Child Interaction Summary Statistics of Voucher Sample by Site, HCHD

| | Cleveland | | | Dallas | | | Total | | |
|----------------------------------|----------------|----------------|----------------|-----------------|----------------|----------------|------------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Parenting stress score 1–5)) | 2.2 (0.6) | 2.2 (0.6) | 2.2 (0.6) | 2.1 (0.6) | 2.2 (50.6) | 2.2 (0.6) | 2.2 (0.6) | 2.2 (0.6) | 2.2 (0.6) |
| Mean family routines score (0–3) | 2.00 (0.62) | 1.97 (0.57) | 1.99 (0.60) | 2.05 (0.55) | 1.98 (0.61) | 2.01 (0.58) | 2.03 (0.58) | 1.97 (0.59) | 2.00 (0.59) |
| Same bedtime, % | | | | | | | | | |
| Almost never | 18.8 (39.1) | 11.1 (31.5) | 15.1 (35.9) | 12.2 (32.8) | 14.1 (34.9) | 13.1 (33.8) | 15.3 (36.0) | 12.8 (33.4) | 14.1 (34.8) |
| 1–2 times a week | 8.5 (28.0) | 15.4 (36.2) | 11.8 (32.3) | 10.0 (30.0) | 12.6 (33.3) | 11.3 (31.7) | 9.3* (29.1) | 13.9 (34.6) | 11.5 (32.0) |
| 3–5 times a week | 32.0 (46.7) | 32.5 (46.9) | 32.2 (46.8) | 30.9 (46.3) | 39.4 (48.9) | 35.1 (47.8) | 31.4 (46.5) | 36.2 (48.1) | 33.8 (47.3) |
| Always or every day | 40.7 (49.2) | 40.9 (49.3) | 40.8 (49.2) | 46.9 (50.0) | 33.8 (47.4) | 40.5 (49.1) | 44.0* (49.7) | 37.1 (48.3) | 40.6 (49.1) |
| Breakfast together, % | | | | | | | | | |
| Almost never | 20.7 (40.6) | 19.1 (39.4) | 19.9 (40.0) | 26.5 (44.2) | 23.4 (42.4) | 25.0 (43.3) | 23.8 (42.6) | 21.5 (41.1) | 22.6 (41.9) |
| 1–2 times a week | 44.0 (49.7) | 47.7 (50.0) | 45.8 (49.9) | 42.2 (49.5) | 39.9 (49.1) | 41.1 (49.2) | 43.1 (49.6) | 43.5 (49.6) | 43.3 (49.6) |
| 3–5 times a week | 17.5 (38.0) | 17.0 (37.7) | 17.3 (37.8) | 18.8 (39.1) | 19.7 (39.8) | 19.3 (39.5) | 18.2 (38.6) | 18.5 (38.8) | 18.3 (38.7) |
| Always or every day | 17.8 (38.3) | 16.2 (36.9) | 17.0 (37.6) | 12.5 (33.1) | 16.9 (37.6) | 14.7 (35.4) | 15.0 (35.7) | 16.6 (37.2) | 15.8 (36.5) |
| Dinner together, % | | | | | | | | | |
| Almost never | 5.4 (22.6) | 5.9 (23.7) | 5.6 (23.1) | 4.6 (20.9) | 5.7 (23.2) | 5.1 (22.1) | 4.9 (21.7) | 5.8 (23.4) | 5.4 (22.5) |
| 1–2 times a week | 10.0 (30.1) | 17.1 (37.7) | 13.4 (34.1) | 12.2 (32.8) | 17.6 (38.2) | 14.9 (35.6) | 11.2** (31.5) | 17.4 (37.9) | 14.2 (34.9) |
| 3–5 times a week | 27.9 (44.9) | 36.6 (48.3) | 32.1 (46.7) | 29.4* (45.6) | 20.4 (40.3) | 24.9 (43.3) | 28.7 (45.3) | 27.8 (44.8) | 28.2 (45.0) |

| | Cleveland | | | Dallas | | | Total | | |
|--|------------------|----------------|----------------|------------------|----------------|----------------|----------------|----------------|----------------|
| | Tx | Control | Total | Tx | Control | Total | Tx | Control | Total |
| Always or every day | 56.7** (49.6) | 40.4 (49.2) | 48.9 (50.0) | 53.8 (49.9) | 56.3 (49.7) | 55.1 (49.8) | 55.2 (49.8) | 49.0 (50.0) | 52.2 (50.0) |
| HOME subscales | | | | | | | | | |
| Parental warmth (0–7) | 4.7 (2.1) | 4.4 (2.2) | 4.5 (2.1) | 5.2 (2.1) | 5.1 (2.2) | 5.1 (2.1) | 5.0 (2.1) | 4.8 (2.2) | 4.9 (2.1) |
| Parental lack of hostility (0–6) | 4.2 (1.0) | 4.1 (1.1) | 4.1 (1.0) | 4.1 (1.1) | 4.1 (1.2) | 4.1 (1.1) | 4.1 (1.0) | 4.1 (1.1) | 4.1 (1.1) |
| Parental verbal skills (0–3) | 1.8 (0.9) | 1.8 (0.9) | 1.8 (0.9) | 2.2 (0.9) | 2.1 (1.0) | 2.2 (1.0) | 2.0 (0.9) | 2.0 (1.0) | 2.0 (0.9) |
| CTS subscales (frequency in past year) | | | | | | | | | |
| Nonviolent discipline | 12.0 (3.3) | 11.5 (3.4) | 11.7 (3.4) | 11.1 (3.4) | 10.7 (3.4) | 10.9 (3.4) | 11.5 (3.4) | 11.1 (3.4) | 11.3 (3.4) |
| Psychological aggression | 6.8 (3.3) | 7.0 (3.5) | 6.9 (3.4) | 5.6 (3.3) | 5.4 (3.4) | 5.5 (3.3) | 6.2 (3.4) | 6.1 (3.5) | 6.1 (3.4) |
| Any corporal punishment | 62.4 (48.5) | 67.9 (46.8) | 65.0 (47.7) | 75.3** (43.2) | 62.7 (48.4) | 69.1 (46.3) | 69.2 (46.2) | 65.1 (47.7) | 67.2 (47.0) |
| <i>N</i> | 305 | 282 | 587 | 329 | 315 | 644 | 634 | 597 | 1231 |

CTS = Conflict Tactics Scale. HOME = Home Observation for Measurement of the Environment. Tx = Treatment .

Within-site differences * $p < .05$, ** $p < .01$.

Notes: Means (SD) reflect site- and condition-adjusted sample weightings. Parenting stress score measures parent-reported feelings regarding challenges to parenting (9 items: 1 “strongly disagree” to 5 “strongly agree”); scale scores are means, with higher scores indicating higher levels of perceived parenting stress. Family routines score (Jensen et al., 1983) measures weekly frequency of certain family routines (4 items: 0 “almost never,” 1 “1–2 times a week,” 2 “3–5 times a week,” and 3 “always or every day”). HOME (13 yes/no items) measures the quality of a child’s home environment. Subscales include parental warmth (7 items), lack of hostility (6 items), and verbal skills (3 items); scale scores are sums, with higher scores indicating a greater degree for each subscale. CTS (6 items) measures annual frequency of primary caregivers’ methods of conflict resolution with their children in the past year (items scale: 1 “never,” 2 “not in last year,” 3 “once,” 4 “twice,” 5 “3–5 times,” 6 “6–10 times,” 7 “11–20 times,” and 8 “more than 20 times”). Subscales include nonviolent discipline (sum of 2 items), psychological aggression (sum of 2 items), and corporal punishment (sum of 2 items then dichotomized: “ever spank your child on the bottom with your bare hand” or “ever hit your child on the bottom with something like a belt, hairbrush, stick, or some other hard object”).

Finally, primary caregivers reported using nonviolent discipline more often in the past year than psychological aggression. More than two-thirds of primary caregivers reported using some form of corporal punishment (for example, spanking or hitting) in the past year.

Overall, parenting stress was moderate. Most families reported having daily or almost daily routines and were observed by interviewers to have parent-child interactions characterized by warmth and the absence of hostility.

Discussion

Synopsis of the HCHD Study

HCHD addresses two longstanding obstacles to elucidating the role of the residential context in children's healthy development. The rich longitudinal survey addresses the lack of measurement of the home, neighborhood, school, family, and children's development in one survey over time. The randomized controlled trial (RCT) design of the housing voucher experiment supports causal inference in the analysis of the voucher sample. Beyond these two achievements, the income-stratified population sample provides a strong foundation for generating hypotheses about the contextual features that may affect children's development.

To date, HCHD has completed two waves of data collection, with plans underway for a third wave. The Wave 1 combined voucher and population sample size is 1,788 primary caregivers and their 2,473 children ages 3–10. Response rates are 79 percent in Wave 1 and 85 percent in Wave 2.

All sample members were living in the Cleveland and Dallas metropolitan areas at Wave 1. These two sites were selected because their public housing authorities (PHAs) randomize voucher allocation and because they met additional criteria indicating strong performance. The metro area contexts provide population growth and geographic and ethnic diversity. Omnibus F tests demonstrate that the randomization of the voucher treatment and control samples was successful. Participation rates (that is, not opting out of the study) were high, at 71 percent for Cuyahoga Metropolitan Housing Authority (CMHA) and 62 percent for Dallas Housing Authority (DHA). At this writing, voucher takeup rates are 59.1 percent for CMHA and 60.3 percent for DHA.

Wave 1 interviews were conducted in person. Because of the pandemic, Wave 2 survey data were collected by telephone. Innovative features in Wave 1 include (1) collecting blood spots from primary caregivers and children in the voucher sample to test for biomarkers of stress, inflammation, and diabetes; (2) a child time diary covering two randomly selected days of the week; (3) interviewer assessments of parenting; and (4) interviewer use of a laser tape measure to record the square footage of living space in the home. The plan is to repeat most of these innovative measurements in Wave 3.

The Voucher Sample at Baseline

Primary caregivers reported good overall health, but approximately 60 percent were obese, and almost 20 percent reported suffering from hypertension and asthma. Likewise, primary caregivers reported their children had very good overall reported health. Rates of asthma were also high among children, at more than 25 percent. Reports of mental health problems were low for both primary caregivers and children.

Most primary caregivers reported having regular routines for children's bedtime and family dinners. Interviewers observed that primary caregivers had warm and nonhostile interactions with their children. Conversely, a majority of parents reported using some form of corporal punishment with their children in the past year.

Voucher sample respondents in the two sites have remarkably consistent responses across a range of housing and neighborhood features. We find only two striking differences between Cleveland and Dallas respondents in these domains. An important note is that these differences have the same effect on both the treatment and control groups in each site. The first is the length of residence. Cleveland households lived in their homes for about 2 years longer than their counterparts in Dallas. A second sizable disparity is the square footage of living space inside the home. Cleveland households lived in housing units roughly 150 square feet larger than housing units in Dallas. This disparity is consistent with the somewhat greater likelihood that Cleveland households lived in single-family homes compared with Dallas households, who were more likely to live in apartments. Nonetheless, households in both sites prioritized "enough space inside the dwelling" when asked to characterize the features of a "nice dwelling." Other priority features were safety and security, good physical condition, and good heating and plumbing.

Nearly two-thirds of respondents across the two sites reported being "satisfied" or "very satisfied" with their neighborhood. The four features that best capture the definition of a "good neighborhood" for the sample are safety, good schools, good neighbors, and not a lot of noise. The large majority, four-fifths, of respondents felt safe in the area immediately surrounding their home, and roughly the same fraction felt safe during the day in the several-block area around their home. This proportion drops by nearly 25 percentage points when asked the same question about their sense of safety at night.

In thinking about what features respondents like most about where the family lives from the perspective of the child's well-being, the modal response (68 percent) was a safe and secure home. The next most important feature (58 percent) was having space in the home where the child could do homework or read.

Data and Documentation Availability

The HCHD survey data will be available as a public use dataset in 2022. A detailed, annotated codebook for each wave will also be available. This access will allow researchers from multiple disciplines to enhance knowledge on the contribution of the residential context to child and family health and well-being, thereby providing a stronger evidentiary foundation for policy and practice.

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U.S. Department of Housing and Urban Development
Office of Policy Development and Research
Washington, DC 20410-6000



February 2023