Education and Well-Being of Children in Assisted Housing Programs
Findings from Washington State

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Assisted housing programs serve many families with school-aged children, but relatively little is known about the impact housing assistance has on education and other measures of youth well-being. This report describes the educational outcomes of youth in assisted housing in Washington State and examines other important factors such as residential and school stability, neighborhood quality, social service utilization, child welfare involvement, and health; and among older youth, employment, college enrollment, births, substance use treatment need, and criminal justice involvement. The study examines two groups of students, in the third and seventh grades, and compares those who recently entered assisted housing to a statistically matched comparison group of peers. The analysis follows these students for five years. All analyses utilize RDA's INVEST database which contains merged administrative data from multiple agencies including the Department of Social and Health Services, the Washington State Education Research and Data Center (ERDC) in the Office of Financial Management (OFM) and the Department of Housing and Urban Development (HUD).

This project, supported by a grant from the Bill & Melinda Gates Foundation, was in collaboration with the University of Pennsylvania's Actionable Intelligence for Social Policy (AISP). Similar analyses were undertaken in Philadelphia, Allegheny County, South Carolina, Milwaukee, and New York, NY. A comprehensive report of findings from all sites is being completed by AISP staff.

Key Findings

1. **HUD assisted housing led to increased residential stability.** When compared to a statistically matched comparison group, youth in families that moved into assisted housing in 3rd or 7th grade were less likely to experience homelessness or a residential move during the follow-up period.

2. **HUD assisted housing did not appear to impact educational outcomes.** Youth who moved into assisted housing performed no differently on state achievement tests than a statistically matched comparison group of youth who did not receive housing assistance. Youth moving into assisted housing were equally likely to miss school and graduate when compared to their matched peers.

3. **HUD assisted housing kept youth connected to social services.** Youth who entered assisted housing were more likely to receive Basic Food and Medicaid during the follow-up period when compared to similar youth who did not receive housing assistance. This finding is consistent with models suggesting assisted housing is a platform for vulnerable families to access necessary services.

Study Design

To assess the impact of HUD housing assistance on the education and well-being of youth, we identified 3rd and 7th graders who moved into HUD assisted housing and received Basic Food or Temporary Assistance to Needy Families (TANF). We then used a statistical matching algorithm to identify comparable youth in the same grades who were also receiving Basic Food or TANF, but did not receive housing assistance. Because moving into public housing was a relatively rare event, we included multiple years of 3rd and 7th graders: from Academic Year 2006 to Academic Year 2011. To account for geographic variability, we matched youth who received assisted housing to similar youth who did not receive housing but attended school in the same school district. The matching algorithm included a comprehensive set of student and household level variables (see Technical Notes).

Once we identified the matched set of HUD-assisted youth and their comparators, we measured outcomes in the follow-up period, beginning in the year after the youth entered housing through Academic Year 2012. The oldest cohorts of youth—those who were in 3rd or 7th grade in 2006—were in 9th grade and one year beyond projected high school graduation by the end of the follow-up period, respectively. Outcomes were measured using RDA's INVEST database, which contains integrated social service, housing, and education data. Outcomes of interest included educational and well-being outcomes, broadly defined. We used panel regressions fitted with generalized estimating equations to examine the impact of housing assistance and whether that impact varied over time.

Study Cohorts

Because of missing outcome data on certain measures, we created four separate cohort groups of 3rd and 7th graders, each with their own matched comparison group.

- For child well-being outcomes we included all youth who did not move out of state in the follow-up period.
- For attendance outcomes, we limited the cohort to include those youth from districts without missing attendance data and who stayed enrolled in school throughout the follow-up period.[1]
- The achievement test score group included youth with valid reading and math test scores in the follow-up period.
- The graduation cohort only included 7th graders from Academic Year 2006 or 2007 because only those youth would have been old enough to graduate by the end of the study period.

TABLE 1

Sample Size for Treatment and Matched Comparison Groups[2]

	3rd grade cohort	7th grade cohort
Child well-being outcomes	N = 2,004	N = 1,521
Attendance	N = 1,887	n/a
Achievement test scores	N = 1,153	n/a
Graduation	n/a	N = 575

SOURCE: INVEST 2012

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[1] We also only examine attendance outcomes for youth in the 3rd grade cohort because high school attendance data is less consistent than attendance data from the middle and elementary school level.

[2] In each cohort, there are equal numbers of treatment and comparison cases. For total sample size, each cell should be multiplied by 2.
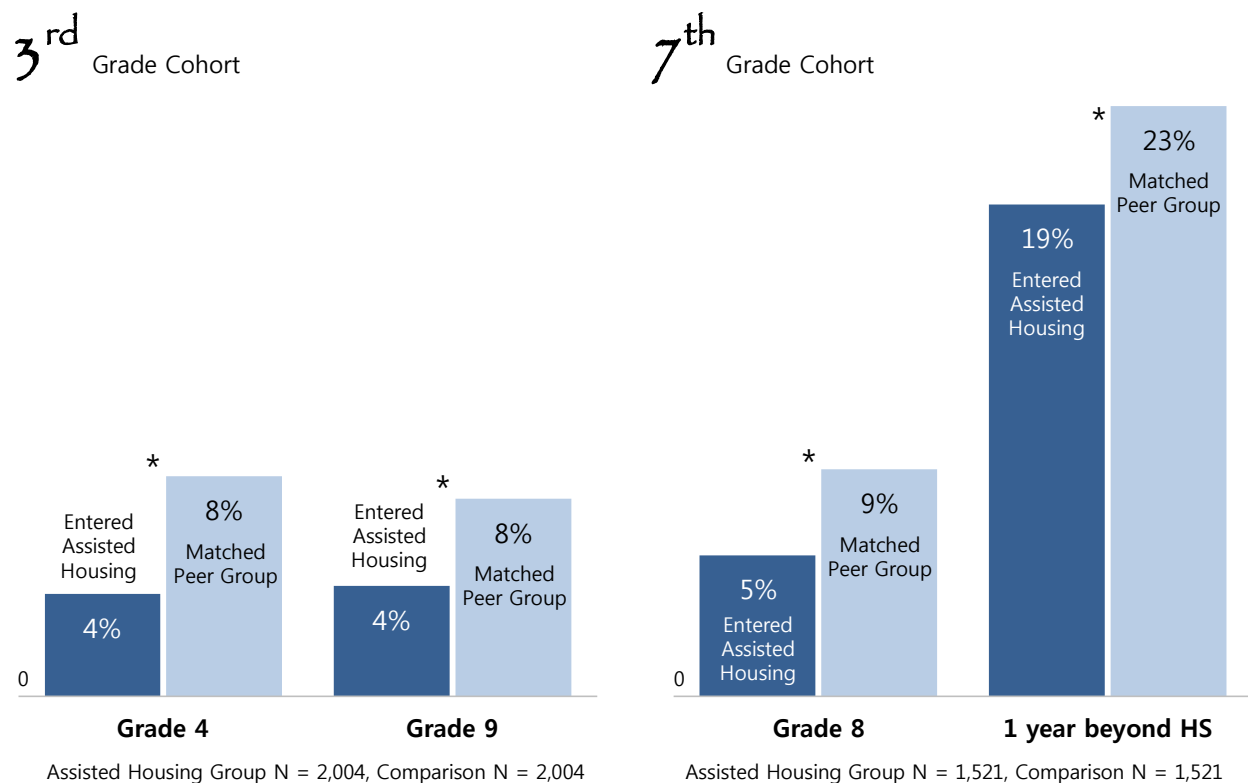
Residential Stability Outcomes

Homelessness and Housing Instability

To assess the impact of assisted housing on residential stability, we identified housing assisted youth and comparison group youth who experienced homelessness or housing instability each year of the follow-up period. Housing status data came from the Automated Client Eligibility System (ACES), which is the data system for determining public benefits eligibility. Our definition of homelessness includes both youth who were literally homeless (e.g. on the street, in a homeless shelter) and those who were experiencing housing instability (e.g. doubled-up or 'couch-surfing').

Figure 1 displays homelessness outcomes for the first and last year of the follow-up period for the 3rd and 7th grade cohorts. Moving into assisted housing significantly reduced the likelihood that a young person experienced homelessness. The reduced likelihood of homelessness was found for both the 3rd and 7th grade cohorts, and in both cases the impact remained through the end of the follow-up period.

In the case of the 7th grade cohort, it is notable that by the end of the follow-up period, rates of homelessness had increased greatly for both assisted and non-assisted housing groups, though the rate was still significantly lower among the young who received assisted housing: 19 percent for the assisted housing group and 23 percent for the comparison youth.

FIGURE 1

Homelessness in the Follow-Up Period
Regression-adjusted probability of homelessness

3rd Grade Cohort

7th Grade Cohort

Assisted Housing Group N = 2,004, Comparison N = 2,004

Assisted Housing Group N = 1,521, Comparison N = 1,521

*Difference is statistically significant.
SOURCE: INVEST 2012

RDA

Residential Moves

We also examined residential moves as a measure of residential stability. Using address data from service records, we measured whether the youth in our study experienced a cross-neighborhood move (as indicated by a change in census tract) in each year of the follow-up study.
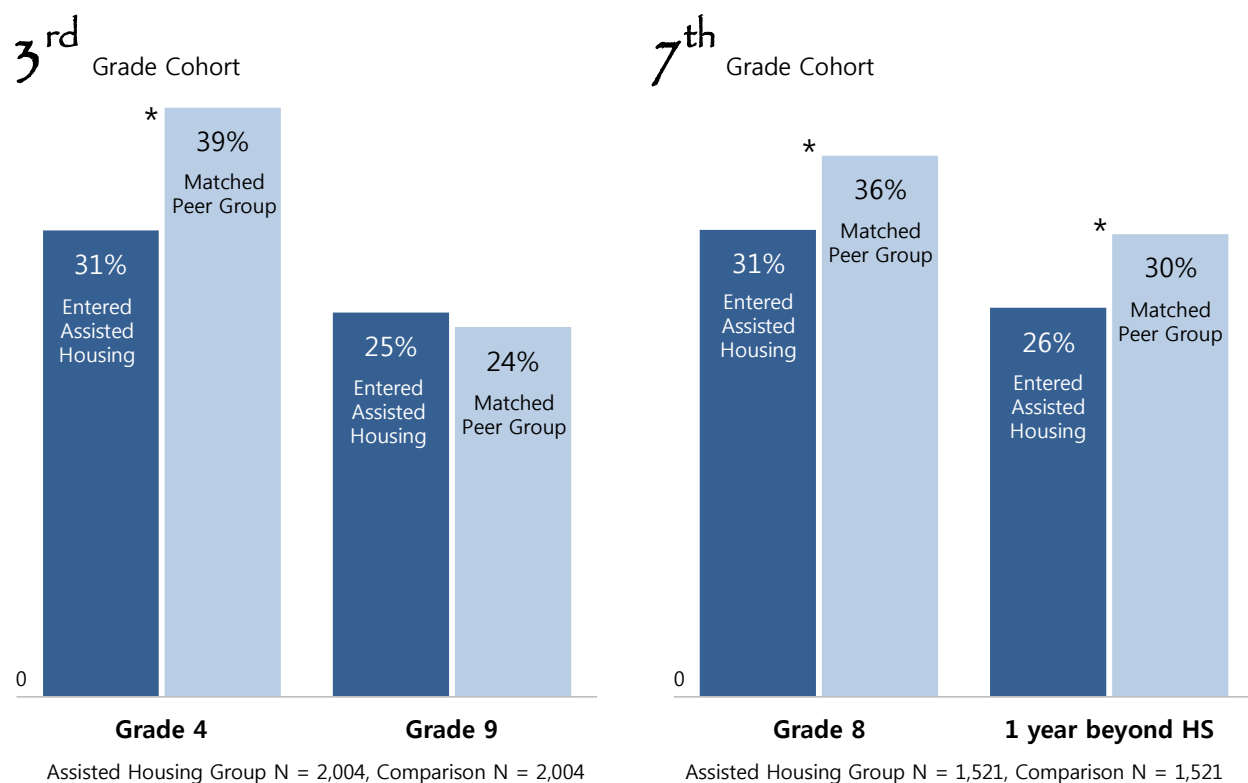

Moving into assisted housing was associated with a reduction in residential moves during the follow-up period.

For the 3rd grade cohort, this effect fades out by the time the youth reach 9th grade. For the 7th grade cohort, the reduction was maintained throughout the follow-up period.

FIGURE 2

Residential Moves in the Follow-Up Period
Regression-adjusted probability of a cross-census tract move

3rd Grade Cohort

Assisted Housing Group N = 2,004, Comparison N = 2,004

7th Grade Cohort

Assisted Housing Group N = 1,521, Comparison N = 1,521

*Difference is statistically significant.
SOURCE: INVEST 2012

Homelessness and residential instability are both associated with poor academic outcomes (Shah, Black, and Felver 2015; Estee et al. 2014). Receiving public housing reduces homelessness and residential mobility for youth, which can set them on a better path for educational achievement.

Education Outcomes

Achievement Test Scores

To assess the impact of assisted housing on test score achievement, we calculated each student's z-scores on state reading and math exams based on published statewide means and standard deviations of each exam in the given grade, subject, and year.[3]
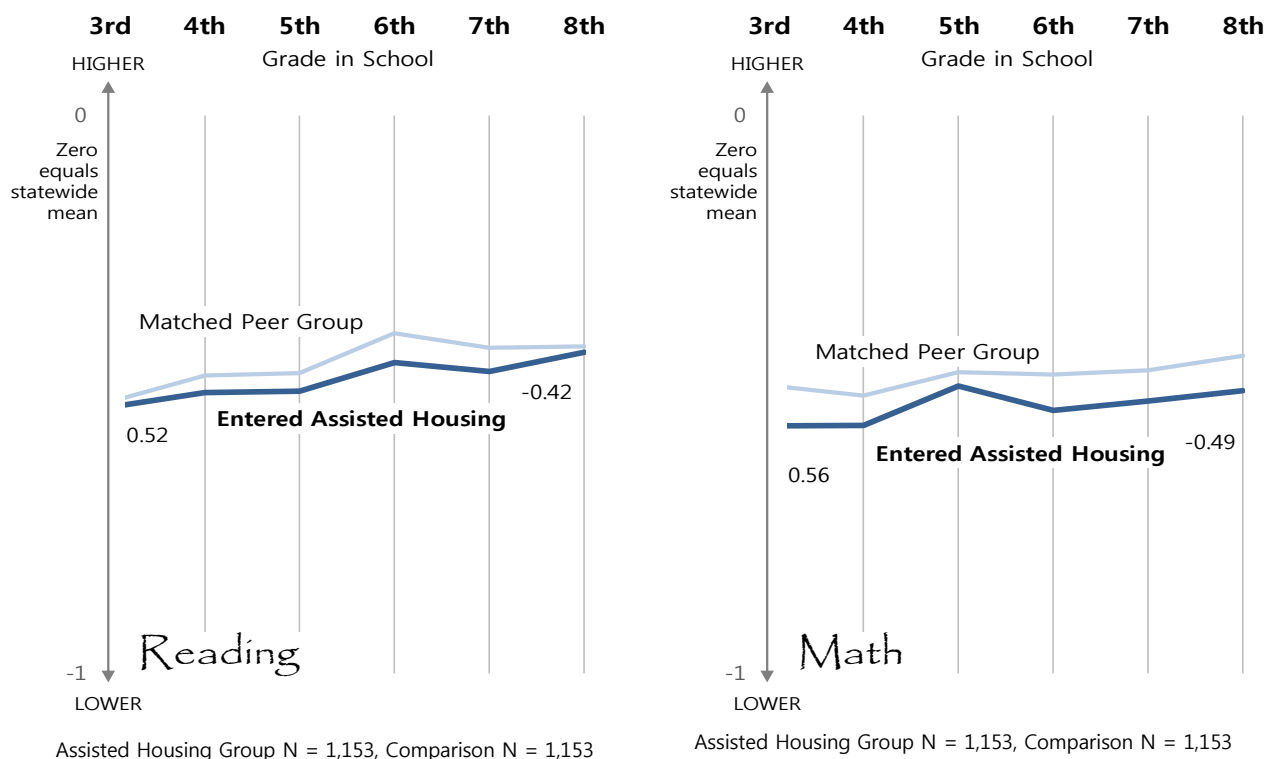
Reading and math exams are given each year in grades 3 through 8 and once in high school, so we focused the test score analysis on the 3rd grade cohort. Because we had multiple years of test scores, we were also able to examine student test score trajectories over the follow-up period.

Our analyses indicated that both the assisted housing and matched peer group scored about half a standard deviation below the statewide mean on state reading and math exams, and that there was not a significant difference between the groups.

Further, reading and math achievement of both the assisted housing and comparison group changed little over time.

FIGURE 3

Reading and Math State Test Scores in the Follow-Up Period   3rd Grade Cohort

Regression-adjusted reading and math z-scores

Assisted Housing Group N = 1,153, Comparison N = 1,153

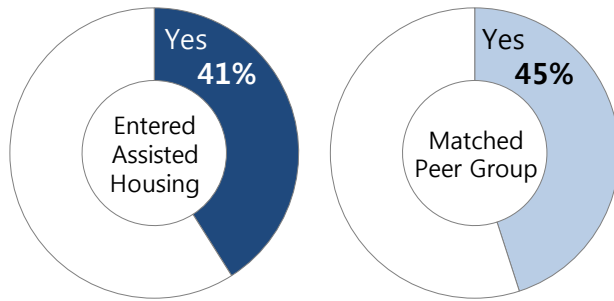Assisted Housing Group N = 1,153, Comparison N = 1,153

SOURCE: INVEST 2012

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[3] We reported z-scores because of ease of comparison to the other AISP partner sites' studies of this topic. However, due to properties of the scale score, a change of the same magnitude at different points of the distribution may not be consistent. Therefore, we also conducted the analyses using scale scores. The substantive findings did not change.

High School Graduation

Graduate in Four Years
Regression-adjusted probability

7th Grade Cohort

Assisted Housing Group N = 575, Comparison N = 575

SOURCE: INVEST 2012

To assess the impact of assisted housing on high school graduation we examined high school exit codes for the oldest cohorts of 7th grade youth: those who started 7th grade in Academic Year 2006 or 2007. As before, we compared outcomes for those who moved into assisted housing to those who did not receive assisted housing.
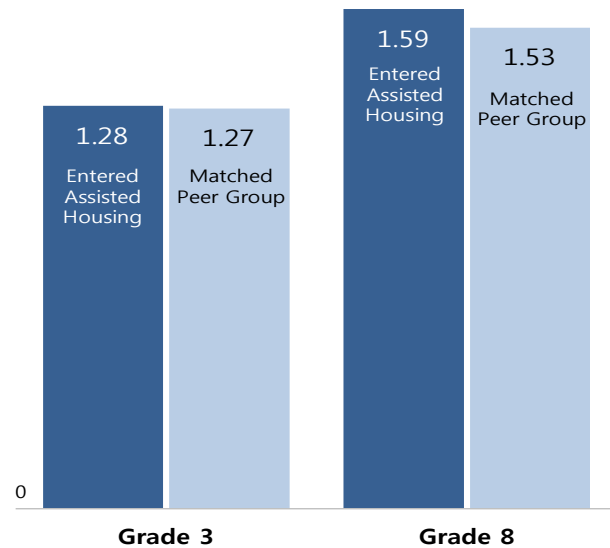
We found no significant differences in high school graduation between the assisted housing group and the comparison group.

In both groups, fewer than one-half of the students graduated four years after entering high school.

School Absence Rate

School Absence Rate
Regression-adjusted

3rd Grade Cohort

Assisted Housing Group N = 1,887, Comparison N = 1,887

SOURCE: INVEST 2012

To assess the impact of assisted housing on school absence rates we examined the number of unexcused absences for each youth as a percentage of the number of total days in the school year. We compared absence rates for those who moved into assisted housing to those who did not receive assisted housing.

Moving into assisted housing was not associated with changes in attendance when compared to the matched peer group. Both the assisted and comparison group missed about the same percentage of the school year, and this pattern persisted into the 8th grade.

The reliability of OSPI absence data during the study period could not be validated against aggregate reports provided by districts. Therefore, the percentages reported here may be subject to measurement error.

Well-Being Outcomes
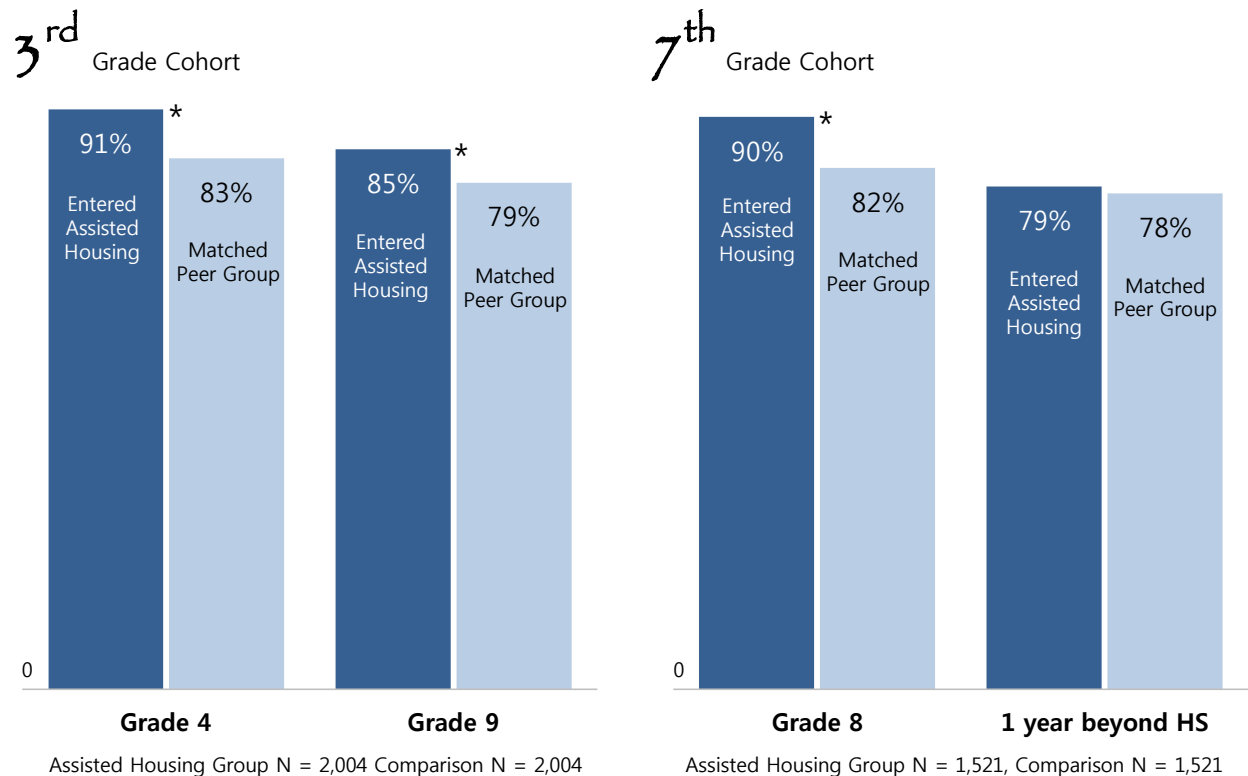
Social Service Connections

We assessed whether receiving assisted housing impacted connections to social services, since public housing authority staff may refer clients to needed services. We examined two components of social service connection: Basic Food receipt and medical coverage. In both cases, we measured whether the youth received the service in each of the follow-up years.

Youth who moved into housing were more likely to stay connected to Basic Food coverage in the follow-up period.

The 3rd grade cohort maintained an increased connection to Basic Food, while the increased connection among the 7th grade cohort was eliminated by the end of the study period.

Youth who moved into housing were also more likely to maintain their connection to medical coverage, at least for the 3rd grade cohort, but levels of coverage were nearly universal for both the assisted housing and comparison groups.

FIGURE 6

Basic Food Receipt in the Follow-Up Period
Regression-adjusted probability of receiving Basic Food

3rd Grade Cohort

91% Entered Assisted Housing *	83% Matched Peer Group
85% Entered Assisted Housing *	79% Matched Peer Group

Grade 4 — Grade 9

Assisted Housing Group N = 2,004 Comparison N = 2,004

7th Grade Cohort

90% Entered Assisted Housing *	82% Matched Peer Group
79% Entered Assisted Housing	78% Matched Peer Group

Grade 8 — 1 year beyond HS

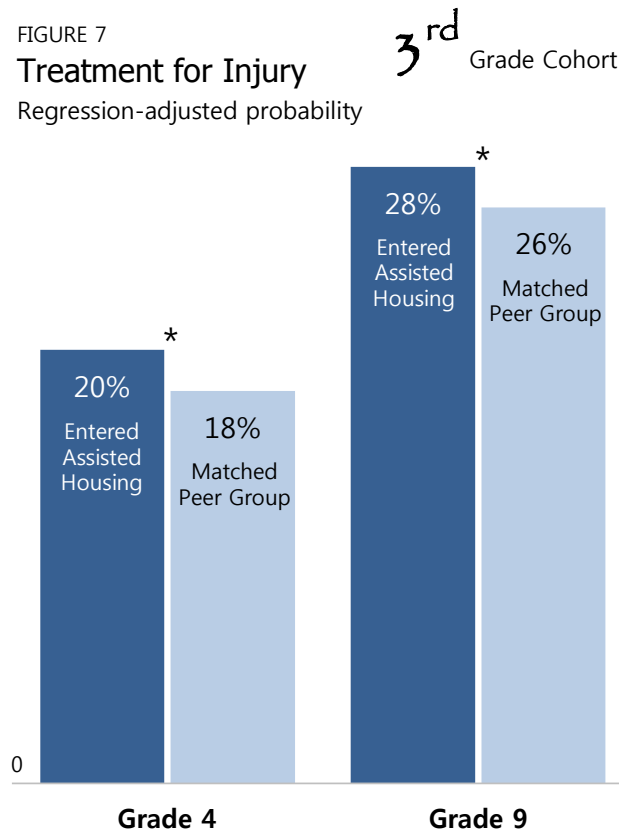Assisted Housing Group N = 1,521, Comparison N = 1,521

SOURCE: INVEST 2012

Treatment for Injury

Treatment for Injury
Regression-adjusted probability

3rd Grade Cohort

Assisted Housing Group N = 2,004 Comparison N = 2,004

SOURCE: INVEST 2012

Assisted housing provides affordable housing that is decent and safe. Therefore, moving into housing may have an impact on health outcomes. We examined the prevalence of injury treatment among the assisted housing group and the comparison group in the follow-up period, using medical claims and encounters data.

Among the 3rd grade cohort, youth who moved into assisted housing were more likely to receive injury treatment. While the difference was statistically significant, it was not large in terms of percentage.

Non-Significant Well-Being Outcomes

The stability offered by assisted housing may affect youth's well-being more broadly. Thus, we examined a number of other well-being related measures. However, we found no differences between youth who received assisted housing and those who did not on these measures. Measures included child welfare involvement, asthma diagnosis, out-of-home placement, as well as employment, college enrollment, births, substance use treatment need, and criminal justice involvement among the older cohort.

Discussion

In this analysis, we compared education and well-being outcomes among youth who received assisted housing and a statistically matched group of youth who did not receive assisted housing. We found that youth who received assisted housing were less likely to experience homelessness and residential moves in the follow-up period, relative to youth who did not enter assisted housing. The results indicate that moving into assisted housing helps stabilize children's lives.

Since moving into assisted housing leads to greater residential stability, we also conducted analyses to see if assisted housing improved educational outcomes for youth. We found that moving into assisted housing had no impact on the education outcomes examined, including test scores, attendance, and high school graduation. Youth who moved into assisted housing performed similarly on these measures when compared to a statistically matched cohort of youth who did not receive assisted housing.

Finally, we examined other well-being outcomes to see if they were impacted by assisted housing. We found that receiving assisted housing increased connections to important social services including Basic Food and medical coverage. However, we found no impacts on other areas of well-being such as child welfare involvement, asthma diagnosis, out-of-home placement, employment, college enrollment, births, substance use treatment need, or criminal justice involvement.

Study Limitations

There were two main limitations for this study. First, we did not limit our assisted-housing group to youth that remained in assisted housing for a specified period of time; instead, we included all youth who entered into assisted housing in a given year regardless of how long they remained. About one-third of the assisted housing group left assisted housing during the follow up period. Findings may change if a minimum threshold of time in assisted housing is used. Second, youth in the comparison group may have received alternative forms of housing assistance. Unfortunately, we did not have data on individuals using other housing assistance, such as developments funded through the Housing Trust Fund. The impacts found in this report could change if those receiving alternative housing assistance were removed from the comparison pool, so that the analysis compared youth in assisted housing to similar youth with no forms of housing assistance.

Directions for Future Research

This research study examined the impacts of assisted housing on child well-being. We found that housing assistance significantly improved residential stability and connections to social services, but we did not find direct impacts on educational outcomes. Housing is incredibly important for stabilizing student's lives, but assisted housing alone may not be sufficient to improve other outcomes for children. Our findings align with the current research literature (see Newman & Harkness (2000); Currie & Yelowitz (2000); Jacob (2004); and Jacob et al. (2015)). However, we believe that questions remain about how public housing may influence the lives and well-being of youth that have not been sufficiently answered in the research literature.

- **The impact of housing-linked services for youth.** Housing increases residential stability and keeps kids connected to social services they need. This finding supports the idea of housing as a platform that can be used to connect families and youth to other important services. As more housing authorities are considering how housing can be used as a platform for educational and social services, effects on well-being outcomes may be found in the future. Studies of programs that intentionally pair housing with educational or other services are needed to understand more about this important connection.

- **Neighborhood poverty and assisted housing.** In additional analyses not included here, we found that youth moving into assisted housing were more likely to reside in neighborhoods with concentrated poverty—where more than 40 percent of their neighbors were also living in poverty—than comparison children. Deeper analysis of the neighborhoods and schools youth in assisted housing access, and how these factors may mediate effects could be a fruitful direction for future research.

- **Early childhood and the impact of assisted housing.** Our analysis focused on youth who moved into housing during 3rd or 7th grade. Developmental research points to the importance of early intervention in changing young people's life trajectories. Therefore, future studies should investigate whether the timing of entry into housing moderates the impacts of housing by examining children who enter housing at younger ages.

- **Longer-term longitudinal follow-up.** This report examined outcomes over a six year follow-up period. However, impacts may take more years to emerge. The 3rd grade cohort was followed through 9th grade. Following this group through high school graduation and into young adulthood could also be a fruitful analysis, as more years of data become available.

STUDY DESIGN AND OVERVIEW

We used a quasi-experimental longitudinal design to examine outcomes over time for children who entered HUD assisted housing and compare them to the outcomes for children with similar risk factors who did not receive HUD assisted housing. Our design focused on two groups, identified between the 2005/2006 school year and 2010/2011 school year:

HUD ASSISTED 'TREATMENT' GROUP	COMPARISON POOL
1. Enrolled in 3rd or 7th grade in Washington state public school.	1. Enrolled in 3rd or 7th grade in Washington state public school.
2. Received TANF or Basic Food in the year.	2. Received TANF or Basic Food in the year.
3. Newly entered HUD assisted housing in the year.[4]	3. Did not receive any HUD housing assistance in the year.

For example, a student who entered 3rd grade in a Washington state public school in 2005/2006, received TANF or Basic Food that year, and entered into HUD assistance in that year for the first time would be classified as a member of the 3rd grade 'treatment' group.

Propensity score matching. Since the HUD assisted 'treatment' group and the comparison group may differ on important characteristics, we employed a statistical technique called propensity score matching to select individuals from the comparison group pool who are similar to the 'treatment' group. Propensity score matching uses a statistical algorithm to select the individuals from the comparison pool who are similar to the 'treatment' group in terms of measured risk factors and demographics, with one comparison case selected for each 'treatment' case.

Analytical approach. We assessed whether housing assistance improved outcomes by conducting a series of panel regressions on the one-to-one propensity score matched data. We follow the oldest 3rd grade cohort through 9th grade and the oldest 7th grade cohort through one year beyond their scheduled graduation year.

DATA SOURCES AND MEASURES

Data used for this analysis was taken from the INVEST database which combines de-identified client data from the DSHS Integrated Client Database with de-identified education data from the Education Research and Data Center at the WA State Office of Financial Management.

Matching variables

- **Demographic characteristics:** Race and gender information comes from compiled client records in the ICDB.

- **School program participation:** Indicators for whether the youth participated in English language learner programs, special education, or free or reduced price lunch were taken from school enrollment records from the baseline year.

- **Social service use history:** Months of participation in TANF and Basic food were measured based on client records in the ICDB.

- **Residential history:** Homelessness history and residential move history were measured over 4 years prior to the baseline year. Homelessness was identified using housing status information from the ACES eligibility system. Residential move history was based on identifying address changes in client records in the ICDB.

- **Parent characteristics:** We identified a young person's parent or household head by using household information from ACES, the data system that tracks benefits for public services. For each parent/household head we identified the following:

  – **Age:** The age of the parent/household was calculated based on client date of birth found in the ICDB.

  – **Earnings and employment history:** We used Employment Security Department wage data to measure parent/householder employment and earnings over 4 years prior to the baseline year.

  – **Incarceration:** Department of Corrections data was used to measure time spent incarcerated in Washington state prisons.

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[4] A new entry is defined as at least one month of housing assistance in the focal year preceded by at least 6 months without HUD housing.
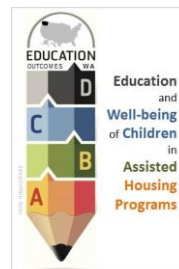
- **Chronic illness risk score:** The chronic illness risk score is calculated based on prescriptions and diagnoses from medical records, with higher scores associated higher likelihood of a chronic illness.
- **Primary language other than English:** Parents/householders whose primary language was not English were identified using their primary language as entered in the ACES eligibility system.
- **Education level:** Parent/householder education level was identified using self-reported education attainment information from ACES.
- **Criminal justice involvement:** Criminal justice involvement was measure using separate variables for convictions, felony charges, and misdemeanor charges for the parent/householder in the baseline year.
- **Behavioral health:** Mental health treatment need is measured using diagnoses and prescriptions from medical records, while substance use treatment need includes diagnoses and prescriptions related to substance use, as well as substance use related arrests.

- **Baseline school characteristics:** We identify the school each youth attended during the baseline year. Using publically available information about school composition we include the following matching variables: percent free/reduced price lunch, percent met reading standard, percent met math standard, and the school district in which the school was located.

Outcome variables

- **Homelessness:** Homelessness data came from the Automated Client Eligibility System (ACES), which is the data system for public benefits eligibility. We included in our measure those who were homeless, with or without housing. Homelessness was measured each year of the follow-up period.
- **Residential moves:** Using address data from service records contained in the ICDB, we measured whether the youth in our study experienced a cross-neighborhood move in each year of the follow-up.
- **Achievement test scores:** We calculated each student's z-scores on state reading and math exams based on published statewide means and standard deviations of each exam in the given grade, subject, and year. We reported z-scores because of ease of comparison to the other AISP partner sites' studies of this topic. However, due to properties of the scale score, a change of the same magnitude at different points of the distribution may not be consistent.
- **Attendance:** Using K-12 enrollment data from OSPI, we calculated each student's yearly attendance rate. The reliability of the OSPI absence data collected prior to the 2012-13 school year could not be validated against aggregate absence reports provided by school districts.
- **High school graduation:** We used exit codes from K-12 enrollment data to identify students who graduated.
- **Social service utilization:** Basic Food and TANF participation during the follow-up period was identified using service data from ICDB.
- **Injury treatment:** Treatment for injuries was identified using diagnosis codes in medical records.
- **Child welfare involvement:** Child welfare involvement was measured as the receipt of any service from Children's Administration. The indicator was measured yearly during the follow-up period.
- **Asthma diagnosis:** We used diagnoses found in medical records to identify youth with asthma.
- **Out-of-home placement:** Out-of-home placement was identified using child welfare placement records contained in the ICDB.
- **Employment:** Youth employment in the follow-up period was identified using Employment Security Wage data.
- **College enrollment:** College enrollment was identified in higher education records from WA State community and technical colleges and four-year universities.
- **Births:** Births to the youth cohort were identified using birth records, parent visitation records from state prisons, and child support enforcement records.
- **Substance use treatment need:** Substance use treatment need was identified using treatment records, diagnoses and prescriptions, as well as drug- and alcohol-related arrests from Washington State patrol.
- **Criminal justice involvement:** Criminal justice involvement was identified based on the presence of any of the follow in ICDB: arrests, convictions, juvenile rehabilitation stays, or state prison stays.

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