Healthy Beginnings at Home

HBAH 1.0 evaluation final report

June 2021

Acknowledgments

CelebrateOne contracted with the Health Policy Institute of Ohio (HPIO) to prepare this report, which summarizes the results of research conducted by Nationwide Children's Hospital, CareSource, the University of Delaware and HPIO.

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Glossary

- **Chi-square:** A statistical test used to determine whether there is a statistically significant difference between results
- **Collateral sanctions:** Laws that bar formerly convicted or incarcerated people from accessing certain employment, housing, education and other opportunities, making it harder for people to meet their basic needs
- **Doubling up:** More than one household living in a housing unit
- **Fair-market rent:** Calculations used to determine housing payment standards for the Housing Choice Voucher program and other payment-based housing programs
- **Harm reduction:** Policies, programs and practices that aim to minimize negative health, social and legal impacts associated with drug use, drug policies and drug laws
- **High-opportunity neighborhoods:** Neighborhoods that are well-connected to resources including high-wage jobs and high-quality education
- **Housing First:** An approach to quickly and successfully connect individuals and families experiencing homelessness to permanent housing without preconditions and barriers to entry, such as sobriety, treatment or service participation requirements
- **Housing Stability Specialist (HSS):** Homeless Families Foundation staff member who provides housing stability services for Healthy Beginnings at Home (HBAH) participants in the intervention group
- **Literal homelessness:** An individual or family who lacks a fixed, regular and adequate nighttime residence, including living in a place not meant for human habitation, living in a shelter designated to provide temporary living arrangements or exiting an institution where they have resided for 90 days or less and who resided in an emergency shelter or place not meant for human habitation immediately before entering that institution
- **Low opportunity neighborhoods:** Neighborhoods that lack connections to resources, such as high-wage jobs or high-quality education
- **On-going subsidy:** Housing assistance, such as housing choice vouchers, available to eligible renters – regardless of HBAH participation – and not time-limited. HBAH participants who received an on-going subsidy will continue to receive the subsidy after exiting the HBAH research project
- **Per member, per month (PMPM):** A measure of healthcare spending based on the amount paid for healthcare and related services for a group of people and the number of months that the group is enrolled in services.
- **Step-down:** A 6-month long reduction of HBAH rental assistance during which HBAH participants without an on-going subsidy paid an increased portion of rent until they were paying the full amount for their unit by month 6 of the reduction
- **Time-limited subsidy:** The rental assistance offered through the HBAH research project that ends when a participant finishes step-down
- **Utility arrears:** Unpaid or overdue utility payments, such as for electricity, gas or water
- **Violence Against Women Act housing protections:** Through the Violence Against Women Act (VAWA) reauthorization of 2013, victims of domestic violence are guaranteed housing-related protections (e.g., transfer to another unit without penalization) because they are a victim/survivor of domestic or intimate partner violence

Healthy Beginnings at Home

HBAH 1.0 evaluation final report

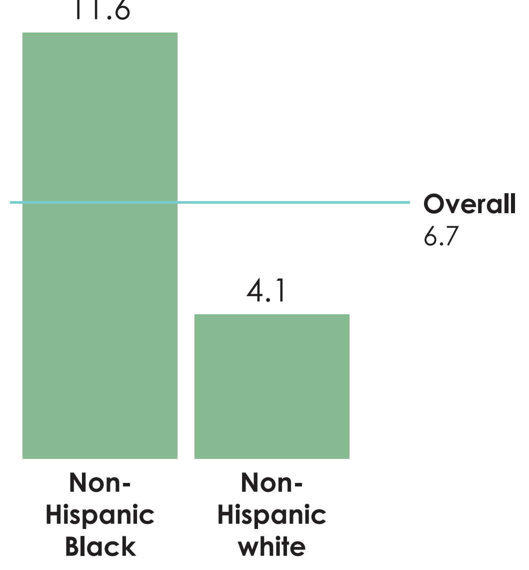
Executive summary

What is Healthy Beginnings at Home?

- Healthy Beginnings at Home (HBAH) is a research project to test the impact of providing rental assistance with housing stabilization services to unstably housed pregnant women at risk of infant mortality
- Responding to large racial disparities in infant mortality (see figure ES 1), HBAH addresses inequities in affordable housing access that contribute to high rates of homelessness, housing instability and poor health outcomes for families of color
- CelebrateOne, an infant mortality prevention collaborative in Columbus, Ohio, led the initial HBAH research project from 2018 to early 2021, enrolling 100 families in the random assignment study with 49 families receiving the housing intervention
- The study was funded by Ohio Housing Finance Agency (OHFA) and several other public and private organizations

Figure ES 1. **Franklin County infant mortality rate, by race, 2020***

Number of deaths of infants under age 1, per 1,000 live births



* Preliminary data

Source: Columbus Public Health

How was HBAH evaluated?

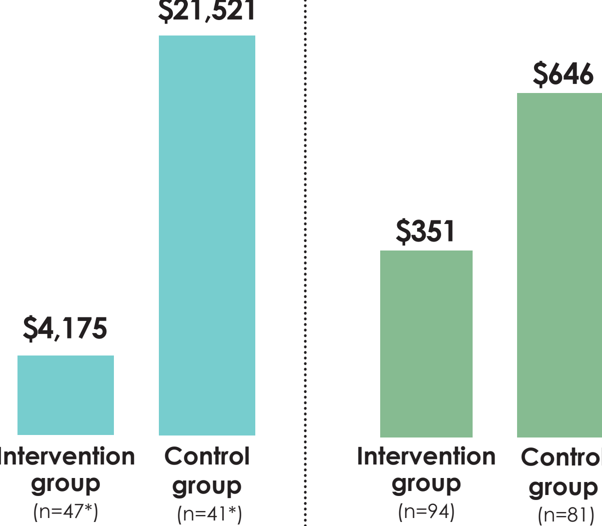
A multi-disciplinary research team conducted a comprehensive evaluation of HBAH, including the following research teams and components:

- Nationwide Children's Hospital: Randomized control trial with interviews and claims data analysis to assess health outcomes
- CareSource (Medicaid managed care organization): Claims data analysis to assess healthcare utilization and spending
- University of Delaware: Evaluation of housing and economic outcomes
- Health Policy Institute of Ohio: Process evaluation

Key findings

The following key findings summarize the most notable evaluation results and considerations for future efforts to improve maternal and infant health through housing interventions.

Figure ES 2. **Medicaid spending for HBAH intervention and control group participants**



* n is based on live births. Does not include fetal deaths.

Source: CareSource

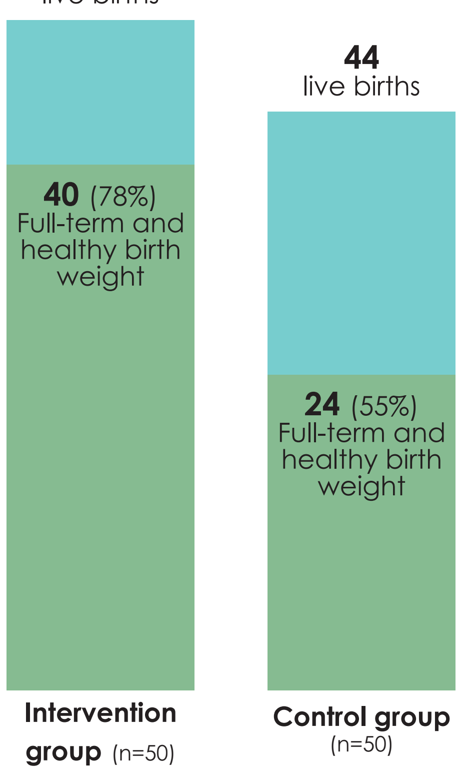
HBAH contributed to large reductions in Medicaid spending, while impacts on health outcomes were more difficult to assess

Medicaid spending. Analysis of Medicaid claims data within the randomized control trial design demonstrated that HBAH participants had far lower healthcare spending than the control group households, who did not receive rental assistance (see figure ES 2). For example, the average paid per claim for infants at the time of delivery was $4,175 for the intervention group compared to $21,521 for the control group, largely driven by lower neonatal intensive care unit utilization among HBAH infants.

Maternal and infant health. Forty of the 51 live births in the intervention group (78%) were infants born full-term at a healthy weight, compared to 24 of 44 in the control group (55%) (see figure ES 3). While these results were promising, they were not statistically significant due to the study size. A study with a larger number of participants is needed to better assess the effectiveness of the HBAH model in improving birth outcomes.

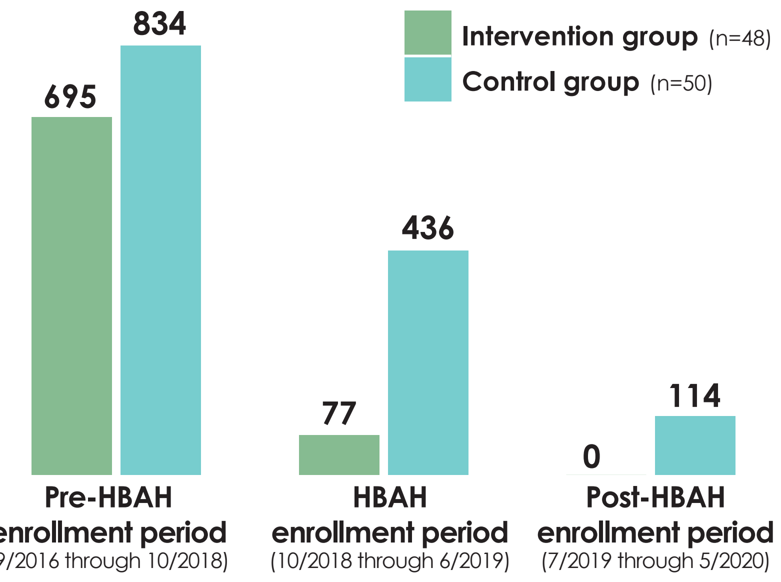
There were no notable differences in self-reported maternal health outcomes.

Figure ES 3. **Birth outcomes for HBAH intervention and control group participants**



Source: Nationwide Children's Hospital analysis of CareSource and self-reported data

Figure ES 4. **Homeless shelter use by HBAH intervention and control group households: Total household-days in shelter**



Source: Homeless Management Information System, collected by Columbus Community Shelter Board, analysis by University of Delaware

2 HBAH improved housing stability

Housing status and shelter use. All HBAH participants lacked stable housing upon being accepted into HBAH, and all obtained affordable, safe apartments which eliminated housing insecurity for the course of their HBAH participation. Once housed, the majority of HBAH intervention group participants maintained their housing with limited documented difficulties. Intervention group participants were much less likely than control group participants to have spent time in a homeless shelter during or after enrollment in the project. For the intervention group, total household days in a shelter declined from 695 prior to HBAH enrollment (9/2016 to 9/2018), to 77 during enrollment to zero within the post-enrollment period; compared to 834, 436 and 114 days, respectively, for the control group (see figure ES 4).

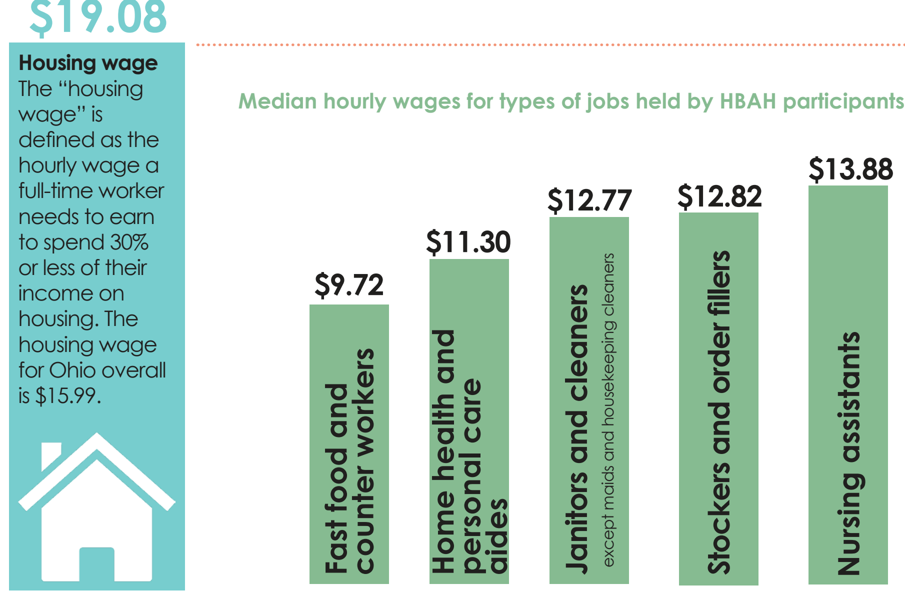
Future housing stability. Over two-thirds of the HBAH households had reasonably good prospects for maintaining their housing as they exited the study. The housing evaluation determined that 35% of the HBAH households were "stably housed" and another 37% were "stably housed with some concerns" at exit. Families with ongoing rental assistance (rather than time-limited assistance that ended at exit) faced a much lower threat of instability when they left the study.

3 Ongoing rental assistance and intensive housing stabilization services are critical for families at high risk for infant mortality

Rental assistance is a critical foundation. At baseline, mothers had many barriers to housing stability, such as having a bad, poor or no credit score (96%), history of criminal justice involvement (48%), no income (46%) and electric bill arrears (60%) (see figure ES 6). The 21-24 months of rental assistance—as well as intensive help to find and maintain housing—provided a critical foundation for the women to care for their newborns and prepare for long-term stability.

Barriers point to depth of need. It took an average of 62 days to secure housing for families after enrollment, reflecting the extreme difficulty of finding affordable housing in Franklin County. Even with the extensive support provided through HBAH, 35% of

Figure ES 5. **How much does a renter need to earn per hour to afford a 2-bedroom apartment in Franklin County, Ohio?**

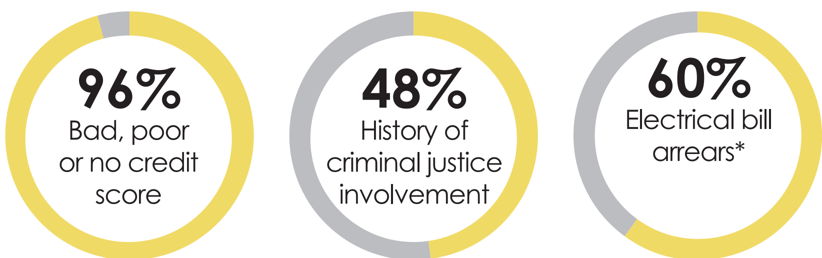


Source: National Low Income Housing Coalition, "Out of Reach 2020: Ohio."

intervention group families moved at least once during the study, and 45% had at least one lease violation. Domestic violence was a contributing factor in 41% of the moves.

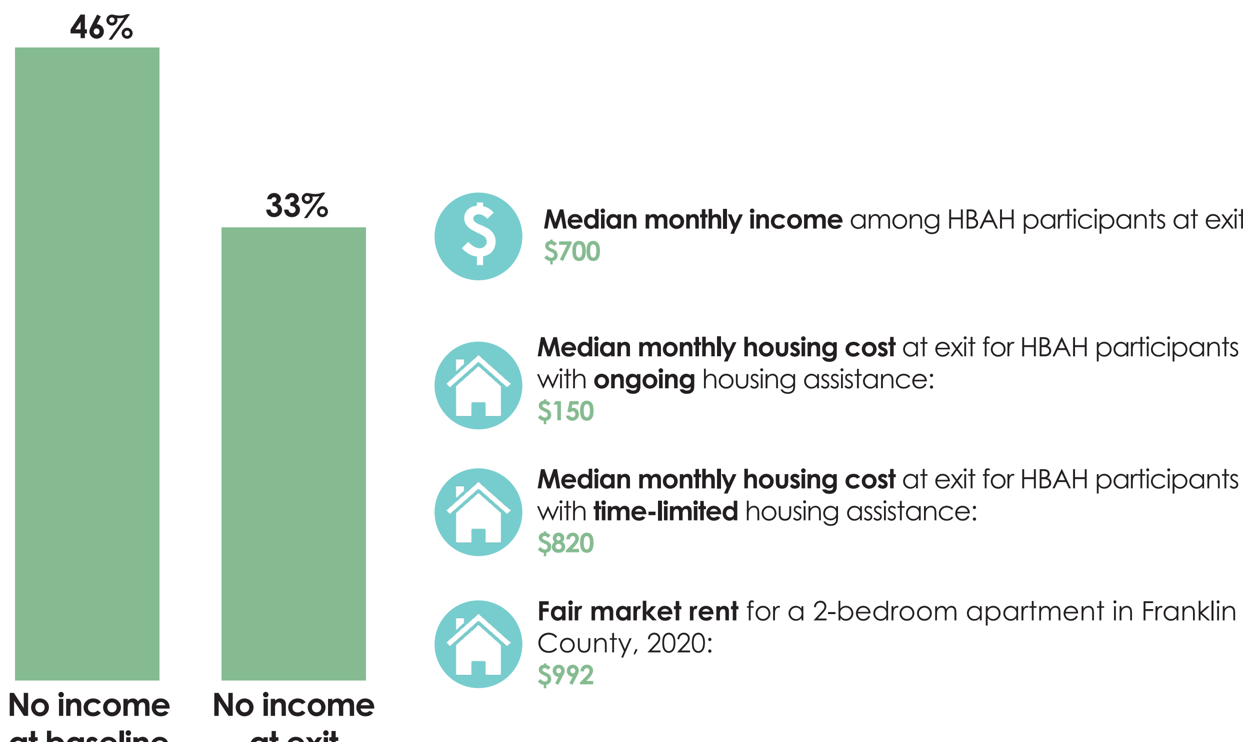
Using Housing First and harm reduction approaches, the housing stability specialists were able to help participants through these challenges to ensure they remained safely housed. Participants reported a high degree of satisfaction with this support, describing their caseworkers as respectful, empowering and highly knowledgeable about how to navigate housing and social service resources.

Figure ES 6. **Housing stability challenges among HBAH participants at baseline** (intervention group, n=50)



*One participant was labeled as "missing" in the electric arrears count
Source: University of Delaware

Figure ES 7. **Income and housing cost burden among HBAH participants** (intervention group, n=49)



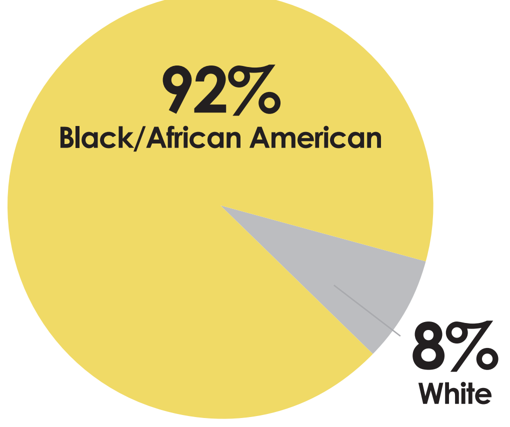
Note: The Fair Market Rent (FMR) is the 40th percentile of gross rents for typical, non-substandard rental units occupied by recent movers in a local housing market. For comparison, the median is the 50th percentile. Gross rent includes housing and utility payments.
Source: University of Delaware and National Low Income Housing Coalition, "Out of Reach 2020."

4 HBAH families faced substantial economic challenges that were exacerbated by the COVID-19 pandemic

Low wages and difficult housing market. At baseline, 34% of the women in the intervention group did not have a high school diploma or GED and, among those who were working, low-wage jobs in the service sector were common. The gap between the income of HBAH families and the cost of housing in Franklin County was stark (see figure ES 5). At exit, 33% of families reported no income, down from 46% at baseline. By the end of the study, the median monthly income of participants was $700. Given that the median fair market rent for a 2-bedroom apartment in Franklin County in 2020 was $992, HBAH families face enormous challenges to housing stability in the absence of ongoing rental assistance (see figure ES 7 on p. 7).

Pandemic job loss and child care shortages. The COVID-19 pandemic destabilized employment progress made by many families. Almost half of the women (45%) reported job loss as a result of the pandemic, and 30% reported loss of child care and/or difficulty finding child care due to the pandemic.

Figure ES 8. **Race of HBAH participants** (intervention group, n=50)



Source: University of Delaware

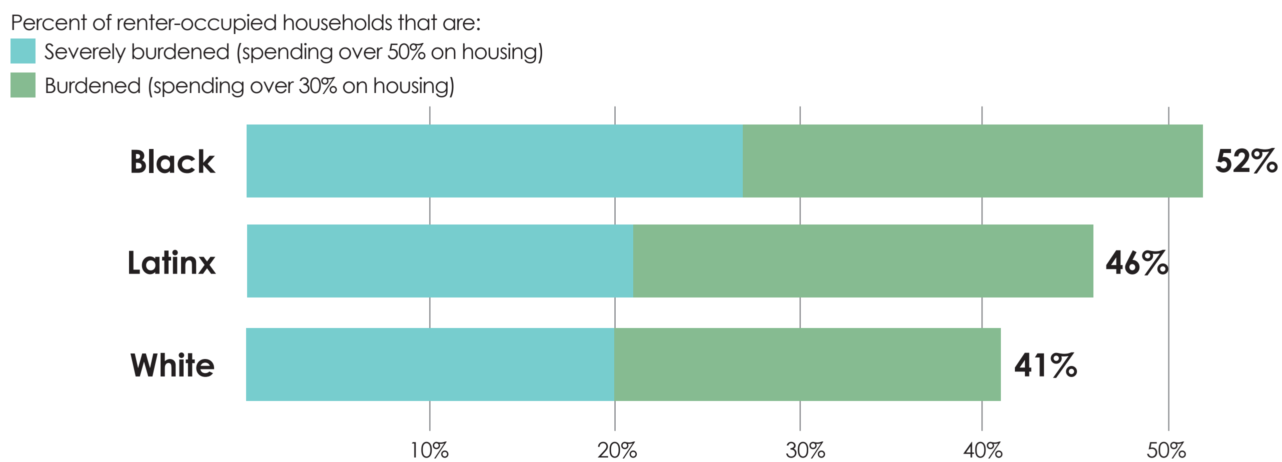
5 Racism, trauma and violence must be addressed

Systemic racism and housing segregation. HBAH focused its recruitment in **CelebrateOne priority zip codes**, which have high rates of infant mortality (see figure ES 1). Most HBAH participants (92%), therefore, were Black/African American (see figure ES 8), reflecting residential racial segregation in Columbus and higher rates of housing cost burden and homelessness among Black/African American families in these communities. Historic and present day racist housing policies, residential segregation and neighborhood disinvestment have contributed to poor health outcomes in the CelebrateOne priority neighborhoods.

At exit, over half of HBAH participants (61%) were living in zip codes that were majority Black and/or high poverty (57% of families living in zip codes where >30% of households live below the poverty line). Notably, participants with time-limited housing assistance were less likely to be living in these segregated, high-poverty zip codes, indicating that some families had to choose between housing stability in a high-poverty area or a potentially higher housing cost burden in a more mixed income "high-opportunity neighborhood."

Trauma and violence. The neighborhoods that many HBAH families live in also have higher rates of crime and violence. Some participants reported that they did not like the neighborhood they were living in, often because of violent neighbors. Many also experienced domestic violence during or prior to participating in the study.

Figure ES 9. **Housing cost burden by race/ethnicity and severity, Columbus region, 2017**



Source: National Equity Atlas, "**Housing Burden. Columbus, OH**."

Recommendations

Informed by the evaluation results, HBAH partners developed 16 recommendations regarding HBAH replication and policy changes needed to improve housing access and health outcomes for families with low incomes. See pages 32-34 for a complete list of recommendations for public and private sector partners at the local, state and federal level.

What is Healthy Beginnings at Home?

Healthy Beginnings at Home (HBAH) is a research project to test the impact of providing rental assistance with housing stabilization services to pregnant women, who have highly unstable housing situations, and are at greater risk of infant mortality. Led by CelebrateOne, an infant mortality prevention collaborative in Columbus, Ohio, the initial HBAH study was launched in 2018 and concluded in early 2021, enrolling 100 families with extremely low incomes. Efforts are currently underway to expand and replicate the HBAH model by CelebrateOne and their HBAH partners.

The 2018-2021 phase was funded by the Ohio Housing Finance Agency (OHFA) and several other public and private organizations. HBAH brought together direct services and expertise from a diverse set of organizations, including the Columbus Metropolitan Housing Authority (CHMA), Homeless Families Foundation (housing stabilization service provider) and CareSource (Medicaid managed care organization).

How was Healthy Beginnings at Home evaluated?

With leadership from Nationwide Children's Hospital, researchers conducted a randomized control study to evaluate the effectiveness of the model in reaching intended health and housing outcomes. Study participants were randomized into an intervention group (n=50[1]) and a control group (n=50). Both groups received usual care services that would be offered regardless of the HBAH project, including referrals to social services (i.e., behavioral health treatment) and access to prenatal care and job coaching services through CareSource.

The intervention group, however, also received rental assistance and comprehensive housing stabilization services provided by the Homeless Families Foundation and CMHA. Some participants in the intervention group received ongoing housing rental assistance, meaning a long-term subsidy that would continue beyond the pilot study. Others received time-limited housing rental assistance.

HBAH partners supplemented the randomized control study with additional evaluation components summarized in figure 1.

Figure 1. **Summary of HBAH pilot evaluation components**

Research team	Design, data sources and outcomes	Links to detailed description of methodology and results
Outcome evaluation		
Nationwide Children's Hospital	• Randomized control trial • Phone interviews conducted with intervention and control group participants at baseline, six months, 12 months, 18 months and 22 months after enrollment • Claims data analysis • Focus on maternal and child health outcomes • Some housing and food security outcomes also assessed	• Preliminary findings were reported in a 2020 **policy brief** • Additional report and article forthcoming
CareSource (Medicaid managed care organization)	• Randomized control trial • Claims data for intervention and control group households (all were insured by CareSource) • Utilization and cost data related to delivery • Per member per month spending for the household from the time of the initial HBAH birth to the baby's first birthday	**Recommendations for Model Replication report**

Figure 1. **Summary of HBAH pilot evaluation components** (cont.)

Research team	Design, data sources and outcomes	Links to detailed description of methodology and results
Outcome evaluation (cont.)		
University of Delaware	• Evaluation of housing outcomes over time for the intervention group only • Data collected at baseline, midpoint and study exit, including abstracted Homeless Families Foundation (HFF) case files and exit surveys compiled by HFF • Focus on housing stability, neighborhood characteristics, income and employment, and housing cost burden	**Housing outcomes report**
Supplemental evaluation and research		
Health Policy Institute of Ohio	• Process evaluation in 2019-2020 to document HBAH implementation, assess participant perceptions, and identify strengths, challenges, opportunities for improvement and implications for replication • Document review, meeting observation, key-informant interviews with eight intervention group participants and 15 staff and partner organization representatives • Supplemental study in 2021 to describe impact of COVID-19 pandemic and implementation of step-down and aftercare phases of the project	**HPIO HBAH process evaluation reports**
Barb Poppe and Associates	Interviews with representatives from 13 organizations and cities in Ohio and other states to discuss possible HBAH model replication and expansion in their communities	**HBAH Outreach Report**, January 2021
Children's HealthWatch	Advisory role	N/A

Figure 2. **Research design for health and housing outcome evaluation**

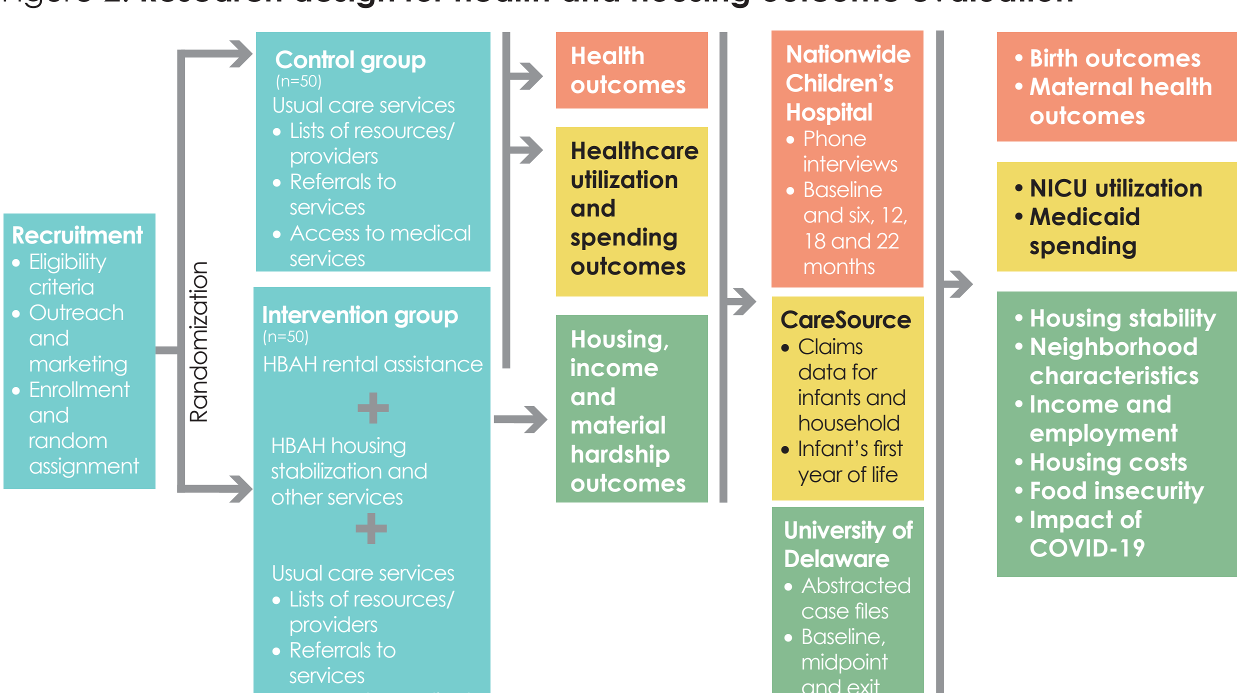


Figure 2 outlines the health and housing outcomes included in the evaluation and provides an orientation for the results presented in the next section of this report.

Strengths and limitations

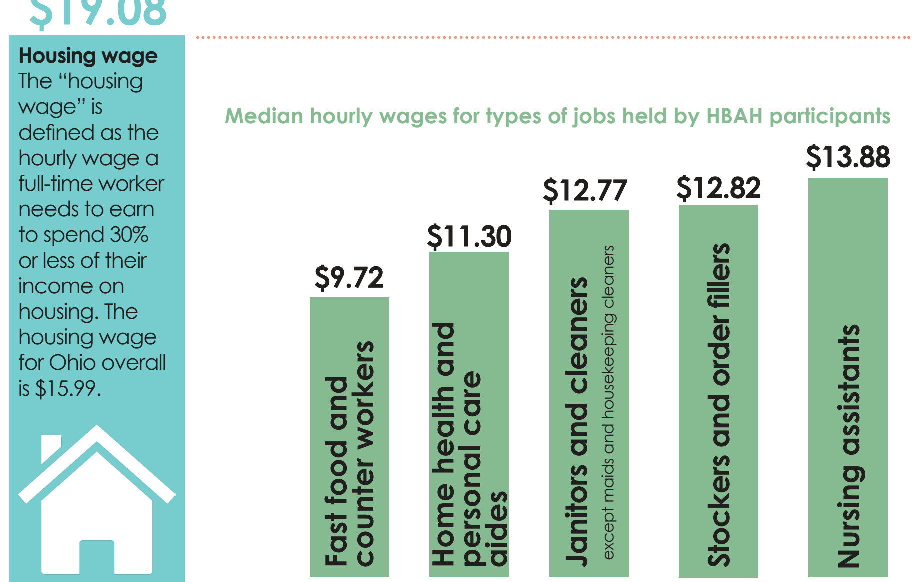
The multidisciplinary nature of the evaluation was a strength because it incorporated a variety of data sources and qualitative and quantitative approaches. Each research team identified some positive findings, indicating that HBAH is a promising approach. One challenge of having multiple evaluation teams, however, was that each team analyzed and reported data in somewhat different ways (e.g. academic journal article format vs. reports for a non-academic audience, use of statistical significance testing, etc.). The necessity of developing data sharing agreements between organizations also slowed down the initial phases of the research. Future evaluations should build upon the strength of the multi-disciplinary approach by allowing more evaluation planning time up front to facilitate data sharing and establish greater clarity about expectations for reporting results in a consistent and timely way.

What is the housing landscape in Franklin County?

Like other states, Ohio faces a critical shortage of affordable housing. Franklin County, where the city of Columbus is located, is the most expensive place to live in Ohio.[2] As a result, Columbus families with young children, especially those with low incomes, are particularly vulnerable to housing instability and homelessness. This challenging environment is important context for understanding the implementation of HBAH.

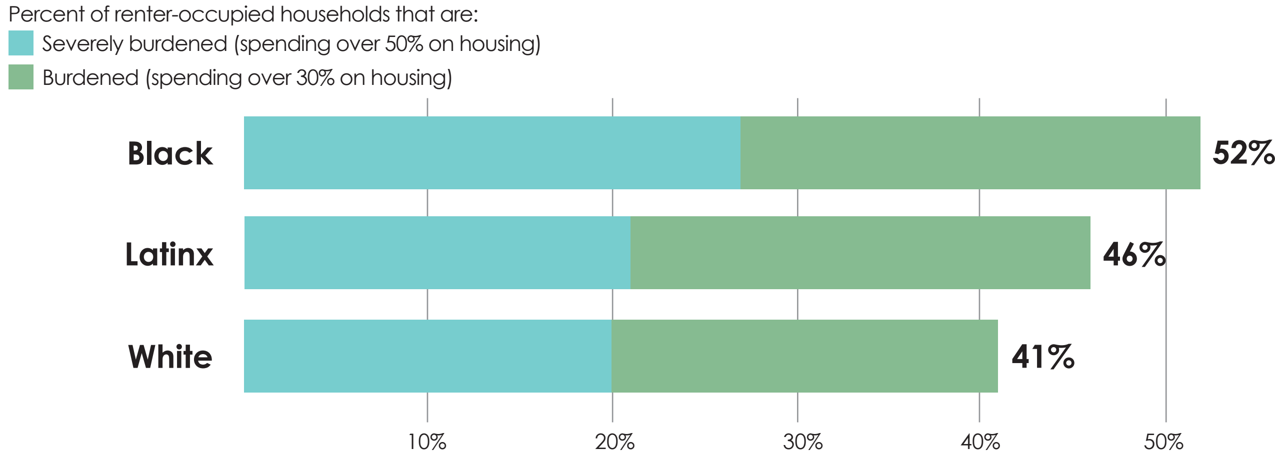
The "housing wage" analysis in figure 3 illustrates the large gap between wages and housing costs. This gap results in many households being "cost-burdened," meaning they spend more than one-third of their income on housing. As shown in figure 4, this burden varies by racial and ethnic group, with Black/African American families being the most likely to spend over 30% or 50% of their incomes on housing.

Figure 3. **How much does a renter need to earn per hour to afford a 2-bedroom apartment in Franklin County, Ohio?**



Source: National Low Income Housing Coalition, "**Out of Reach 2020: Ohio**."

Figure 4. **Housing cost burden by race/ethnicity and severity, Columbus region, 2017**



Source: National Equity Atlas, "**Housing Burden. Columbus, OH.**"

What were the evaluation results?

Participant characteristics

Figure 5 displays demographic information for the intervention and control groups. A majority of both groups were non-Latinx, Black or African American. There were no statistically significant differences between the intervention and control groups in terms of race, ethnicity, age and gestational age.

It is important to note that HBAH was able to successfully recruit the target population, demonstrating that this type of study is a viable way to assess the impact of a housing intervention on family health and well-being.

Figure 5. **Demographic characteristics of HBAH intervention and control group participants**

	Intervention group (n=50)	**Control group** (n=50)	**Total** (n=100)
Race			
Black/African American	46 (92%)	41 (82%)	87 (87%)
White	4 (8%)	8 (16%)	12 (12%)
Missing	0 (0%)	1 (2%)	1 (1%)
Ethnicity			
Non-Latinx (any race)	47 (94%)	48 (96%)	95 (95%)
Latinx (any race)	3 (6%)	1 (2%)	4 (4%)
Missing	0 (0%)	1 (2%)	1 (1%)
Age (at intake)			
18-24	24 (48%)	27 (54%)	51 (51%)
25-29	14 (28%)	15 (30%)	29 (29%)
30-34	10 (20%)	4 (8%)	14 (14%)
35+	2 (4%)	4 (8%)	6 (6%)
Gestational age (at intake)			
1st trimester	11 (22%)	10 (20%)	21 (21%)
2nd trimester	39 (78%)	40 (80%)	79 (79%)

Notes: For the total group, percent values are the same as frequency values, as total group consists of 100 women/households. In tests of difference (chi-square tests), none of the differences between the participant and control groups in the four data elements described here attained statistical significance (p-value < .10).
Source: University of Delaware

The baseline socioeconomic characteristics displayed in figure 6 show that most women in the intervention and control groups had relatively low educational attainment, low incomes and poor or no credit scores. Almost half (44%) had criminal records or prior contact with the criminal justice system.

Figure 6. **Socioeconomic characteristics of the heads of household: HBAH participant and control groups**

	Intervention group (n=50)	**Control group** (n=50)	**Total** (n=100)
Education attained			
Less than high school	2 (4%)	3 (6%)	5 (5%)
Some high school	15 (30%)	15 (30%)	30 (30%)
High school diploma/GED	29 (58%)	24 (48%)	53 (53%)
Post high school	2 (4%)	6 (12%)	8 (8%)
Missing	2 (4%)	2 (4%)	4 (4%)
History of criminal justice involvement			
Yes	24 (48%)	20 (40%)	44 (44%)
No	26 (52%)	30 (60%)	56 (56%)
Income per month			
Zero	23 (46%)	23 (46%)	46 (46%)
$1 to $500	7 (14%)	2 (4%)	9 (9%)
$501 to $1000	8 (16%)	10 (20%)	18 (18%)
Above $1000	12 (24%)	15 (30%)	27 (27%)
Credit Score			
Above 580 (“low” or “average”)	2 (4%)	6 (12%)	8 (8%)
Below 580 (“bad” or “poor”)	21 (42%)	17 (34%)	38 (38%)
No score (Insufficient information)	27 (54%)	27 (54%)	54 (54%)

Note: In tests of difference (chi-square tests), none of the differences between the participant and control groups in the data elements described here attained statistical significance (p-value < .10).
Source: University of Delaware

As shown in figure 7, homelessness, doubling up, eviction and utility arrears were very common among study participants. There were no statistically significant differences between the intervention and control groups on these housing distress factors at baseline.

Figure 7. **Homeless circumstances and housing distress factors (heads of household): HBAH participant and control groups**

	Intervention group (n=50)	**Control group** (n=50)	**Total** (n=100)
Ever experienced any literal homelessness			
Yes	33 (66%)	31 (62%)	64 (64%)
No	16 (32%)	19 (38%)	35 (35%)
Missing	1 (2%)	0 (0%)	1 (1%)
Currently "Doubled-Up" in another household			
Yes	38 (76%)	32 (64%)	70 (70%)
No	12 (24%)	18 (36%)	30 (30%)
Number of times evicted			
None	28 (56%)	31 (62%)	59 (59%)
One	9 (18%)	8 (16%)	17 (17%)
Two or more	13 (26%)	11 (22%)	24 (24%)
Over three moves in past year			
Yes	20 (40%)	21 (42%)	41 (41%)
No	29 (58%)	29 (58%)	58 (58%)
Missing	1 (2%)	0 (0%)	1 (1%)
Current electric bill arrears			
Yes	30 (60%)	32 (64%)	62 (62%)
No	19 (38%)	18 (36%)	37 (37%)
Missing	1 (2%)	0 (0%)	1 (1%)
Current gas bill arrears			
Yes	28 (56%)	26 (52%)	54 (54%)
No	21 (42%)	24 (48%)	45 (45%)
Missing	1 (2%)	0 (0%)	1 (1%)

Note: In tests of difference (chi-square tests), none of the differences between the participant and control groups in the data elements described here attained statistical significance (p-value < .10).
Source: University of Delaware

Health outcomes

Birth outcomes

Forty of the 51 live births in the intervention group (78%) were infants born full-term at a healthy weight, compared 24 of 44 in the control group (55%) (see figure 8). There were no fetal deaths[3] in the intervention group, compared to four in the control group.

While these results were promising, there were no statistically significant differences between the intervention and control group for the outcomes listed in figure 8 due to the small study size. A study with a larger number of participants is needed to better assess the effectiveness of the HBAH model in improving birth outcomes.

Figure 8. **Birth outcomes for HBAH intervention and control group participants**

	Intervention group (n=50)	**Control group** (n=46)	**Total** (n=96)
Number of fetuses	51*	48*	99*
Fetal deaths	0	4	4
Live births	**51**	**44**	**95**
Outcomes among live births			
Full-term and healthy birth weight	**40 (78%)**	**24 (55%)**	**64 (67%)**
Pre-term and low birth weight	5 (10%)	5 (11%)	10 (11%)
Pre-term and healthy birth weight	4 (8%)	8 (18%)	12 (13%)
Full-term and low birth weight	2 (4%)	6 (14%)	8 (8%)
Missing data	0 (0%)	1 (2%)	1 (1%)

Notes: None of the differences between groups were statistically significant. P-values for singletons were 0.1021 for fetal mortality, 0.2009 for preterm birth and 0.1518 for low birth weight. P-values for all births (singletons and twins) were 0.0517 for fetal mortality, 0.1511 for preterm birth and 0.1620 for low birth weight.
* Includes singletons and twins
Sources: Nationwide Children's Hospital analyis of CareSource and self-reported data, and CelebrateOne

Maternal health outcomes

In addition to birth outcomes, the Nationwide Children's Hospital (NCH) study also collected information about maternal health. Figure 9 displays these outcomes as reported by intervention and control group participants 22 months after enrollment. Overall, outcomes were fairly similar for the two groups, although tobacco/nicotine and alcohol use were slightly higher in the control group.

Figure 9. **Health outcomes for intervention and control group participants at 22-months after enrollment**

	Intervention group (n=38)	**Control group** (n=30)	**Total** (n=68)
Have you recently tested positive on a pregnancy test or are you wondering if you're pregnant? Yes	4 (11%)	1 (3%)	5 (7%)
Are you currently smoking cigarettes/e-cigarettes or vaping? Yes	9 (24%)	12 (39%)	21 (32%)
Are you currently consuming alcohol? Yes	2 (5%)	3 (10%)	5 (8%)
Are you currently using one or more of the following drugs: • Opiates • Meth • Marijuana • Cocaine	*	*	6 (9%)
Would you say that in general your health is _____? Excellent	8 (22%)	9 (30%)	17 (25%)
Would you say that in general your health is _____? Very good	11 (30%)	7 (23%)	18 (27%)
Would you say that in general your health is _____? Good/ Fair/ Poor	18 (47%)	14 (47%)	32 (48%)

Note: The outcomes in this figure were not tested for statistical significance.
*Total not disaggregated by intervention and control
Source: Nationwide Children's Hospital analysis of 22-month surveys

Four intervention group participants reported at 22 months that they were pregnant or suspected they may be pregnant (see figure 9). Overall, HFF documented a total of nine additional pregnancies and births to seven HBAH intervention group participants—referring to pregnancies and births that occurred after the initial pregnancy that qualified the family for HBAH participation. These additional pregnancies were not included in the NCH study and are therefore not included in the outcomes reported in figure 8.

Healthcare utilization and spending

NICU utilization

Neonatal intensive care unit (NICU) utilization was lower among the intervention group infants. Thirteen percent of intervention group newborns were placed in the NICU, compared to 33% of control group infants. Among sick newborns placed in the NICU, the average length of stay was shorter for the intervention group (eight days) compared to the control group (29 days).

Figure 10. **Neonatal intensive care unit (NICU) utilization**

	Intervention group (n=47)	**Control group** (n=41)
Newborns placed in NICU	6 (13%)	13 (32%)
Average length of stay in hospital		
Well newborn	2 days	2 days
Sick newborn	8 days	29 days

Note: The outcomes in this figure were not found to be statistically significant
Source: CareSource analysis of claims data

Medicaid spending

As shown in figure 11, the average amount paid per claim for infants at the time of delivery was far lower for the intervention group ($4,175) compared to the control group ($21,521). Looking more broadly at average spending for the entire household (see figure 12) per member per month (PMPM), intervention group costs ($350.54) were almost half as much as control group costs ($646.00). (Medicaid managed care organizations, such as CareSource, analyze PMPM spending to gauge the cost-effectiveness of interventions.)

Figure 11. **Average paid per claim for intervention and control group participants: Infant only at time of birth until initial release**

	Intervention group (n=47)	**Control group** (n=41)
Sick newborn	$15,848	$63,653
Well newborn	$2,466	$2,033
TOTAL	**$4,175**	**$21,521**

Note: One newborn was labeled as "not stated" in the CareSource data. Not stated means the newborn did not have a diagnosis code on the claim to identify as sick or well.
Source: CareSource analysis of claims data

Figure 12. **Total Medicaid spending per member, per month (PMPM) for intervention and control group participants: All household claims (from date of infant's birth to first birthday)**

	Intervention group (n=94)	**Control group** (n=81)
Cost for household (without outliers)	$350.54	$646.00
Cost for household (with outliers)	$432.78	$1,110.03

Note: The outcomes in this figure were not found to be statistically significant
Source: CareSource analysis of claims data

Housing and income

The housing and income results presented below describe outcomes for the HBAH intervention group at the time they exited the HBAH study, including differences between outcomes for participants with ongoing housing rental assistance (a long-term subsidy) and those with time-limited housing rental assistance. One outcome, homeless shelter use, was tracked for the control group, as well as the HBAH intervention group participants.

Housing

All 49 participants in the intervention group who remained in the study after enrollment were placed in housing provided through HBAH. Twenty-seven participants had housing with an ongoing subsidy, often in a project-based unit. Twenty-two participants had privately-owned units with time-limited rental assistance that gradually decreased during the "step down" phase and then ended at the conclusion of the study. It took an average of 62 days to secure housing for families after they enrolled in the study.

At exit, over half of these HBAH participants (61%) were living in zip codes that were majority Black/African American and/or high poverty (57% of families living in zip codes where >30% of households live below the poverty line)(see figure 13). Notably, the housing sites for the apartments with ongoing housing assistance were mostly in low-opportunity neighborhoods. Participants with time-limited housing assistance were less likely to be living in these segregated, high-poverty zip codes, indicating that some families had to choose between housing stability in a high-poverty area or a potentially high future housing cost burden in a more integrated "high-opportunity neighborhood."

Figure 13. **Zip code characteristics grouped by type of housing assistance for HBAH participants at exit** (intervention group)

	Ongoing housing assistance (n=27)	**Time-limited housing assistance** (n=22)	**Total** (n=49)
Poverty rate in zip code			
>30%	22 (81%)	6 (27%)	28 (57%)
Between 19.6% and 30%	2 (8%)	14 (64%)	16 (33%)
Less than overall Columbus rate (19.5%)	3 (11%)	2 (9%)	5 (10%)
Percent population is Black			
Majority Black (>50%)	24 (89%)	6 (27%)	30 (61%)
Between 30% and 49% Black	0 (0%)	6 (28%)	6 (12%)
Less than overall Columbus rate (29%)	3 (11%)	10 (45%)	13 (27%)

Note: Chi-square test for differences among the two housing assistance groups with regards to housing assistance types and poverty level groupings provides a chi-square statistic of 18.02 ($p < .001$). Likewise, the chi-square statistic among the two housing assistance groups for proportion of zip code population that is Black is 16.97 ($p < .001$; with distribution adjusted to 1% value for 0% column value)

Source: University of Delaware analysis of exit surveys

Although a majority of participants did not move or experience a lease violation, these were experienced by some participants during the 2-year research project. About one-third of intervention group families (35%) moved at least once during the study, and 45% had at least one lease violation (see figure 14). Reasons for lease violations included late or nonpayment of rent, illegal activity and difficulties getting along with the landlord. Domestic violence was a substantial precipitating or contributing factor in seven of the 17 moves (41%).

Figure 14. **Lease violations and moves by type of housing placements for HBAH participants** (intervention group)

	Ongoing housing assistance (n=27)	**Time-limited housing assistance** (n=22)	**Total** (n=49)
Lease violations			
0	20 (74%)	7 (32%)	27 (55%)
1	2 (7%)	4 (18%)	6 (12%)
Multiple	5 (19%)	11 (50%)	16 (33%)
Moves			
0	18 (67%)	14 (64%)	32 (65%)
1	7 (26%)	5 (23%)	12 (24%)
2	2 (7%)	3 (14%)	5 (10%)

Notes: Chi-square test of difference for lease violations yields a chi-square statistic of 8.76 ($p < .05$). Chi-square test of difference for moves was non-significant. Chi-square values determined using **calculator.**
Source: University of Delaware analysis of exit surveys

HFF caseworkers provided a qualitative assessment of housing prospects for each HBAH family at the end of the study. Overall, they described about one-third of participants (35%) as stably housed, 10% as having lost their housing and living "doubled up," and the remainder of families along a continuum of instability (see figure 15). Households with time-limited assistance were more likely than those with ongoing assistance to be described as having a threat to stability or having lost housing. The proportion of participants who were assessed as stably housed was similar for both housing assistance groups.

Figure 15. **Qualitative assessment of housing stability for HBAH participants, grouped by type of housing assistance** (intervention group)

	Ongoing housing assistance (n=27)	**Time-limited housing assistance** (n=22)	**Total** (n=49)
Profile			
Assessed as stably housed	9 (33%)	8 (36%)	17 (35%)
Assessed as stably housed with some concerns	15(56%)	3 (14%)	18 (37%)
Maintaining housing with threat to stability	0 (0%)	6 (27%)	6 (12%)
Lost housing & living "doubled up"	0 (0%)	5 (23%)	5 (10%)
Maintaining housing with little HBAH contact	3 (11%)	0 (0%)	3 (6%)

Note: Unable to apply chi-square test due to multiple table cells with zero-values
Source: University of Delaware

HBAH participation was associated with reduced use of homeless shelters. For the intervention group, total household days in a shelter declined from 695 prior to HBAH enrollment (9/2016 to 9/2018), to 77 during enrollment (10/2018 to 6/2019) to zero within the post-enrollment period (10/2018 to 6/2019), compared to 834, 436 and 114 days, respectively, for the control group (see figure 16).

Figure 16. **Homeless shelter use by HBAH participant households and a control group**

	Intervention group (n=48)	**Control group** (n=50)
Pre-HBAH enrollment period (9/2016 through 9/2018)		
Households using shelter	9 (19%)	13 (27%)
Days households were in shelter	695	834
HBAH enrollment period (10/2018 through 6/2019)		
Households using shelter	3 (6%)	10 (20%)
Days households were in shelter	77	436
Post-HBAH enrollment period (7/2019 through 5/2020)		
Households using shelter	0 (0%)	5 (10%)
Days households were in shelter	0	114

Note: Differences in outcomes in this figure were not tested for statistical significance
Source: Data from the homeless management information system (HMIS) collected by the Columbus Community Shelter Board, analysis by University of Delaware

Income, employment and housing cost burden

As shown in figure 17, most HBAH families had extremely low incomes at baseline; 46% reported zero income. At exit, 33% participants reported zero income. About half of participants (53%) reported that their income increased since HBAH enrollment, while 35% said their income was unchanged and 12% said it decreased. Employment was the most commonly reported source of income; 39% were employed at exit. Many participants were employed in the service sector (in roles such as fast food restaurants or janitorial services) or in health care (in roles such as nursing assistants).

There were significant differences between the ongoing and the time-limited housing assistance groups, with higher income and more employment among those with time-limited assistance.

Figure 17. **Reported income at point of exit survey, grouped by type of housing assistance** (intervention group)

	Ongoing housing assistance (n=27)	**Time-limited housing assistance** (n=22)	**Total** (n=49)
Monthly income amount			
No income	9 (33%)	7 (32%)	16 (33%)
$100-$499	4 (15%)	1 (5%)	5 (10%)
$500-$999	5 (19%)	2 (9%)	7 (14%)
$1,000-$1,999	7 (26%)	4 (18%)	11 (22%)
$2,000-$3,173	2 (7%)	8 (36%)	10 (20%)
Median income	$613	$1,100	$700
Income at exit exceeds household poverty income guidelines	4 (14%)	4 (18%)	8 (16%)
Change in income since HBAH enrollment			
Income increased	4 (15%)	2 (9%)	26 (53%)
Income remained unchanged	10 (37%)	7 (32%)	17 (35%)
Income decreased	13 (48%)	13 (59%)	6 (12%)
Income sources (selected)			
Employment	6 (22%)	13 (59%)	19 (39%)
Unemployment	7 (26%)	1 (5%)	8 (16%)
SSI disability benefits	5 (19%)	0 (0%)	5 (10%)
Child support	3 (11%)	2 (9%)	5 (10%)
OWF/TANF (cash assistance)	1 (4%)	0 (0%)	1 (2%)

Notes: 1) Ten participants had not yet exited from HBAH when survey data was collected
2) Chi-square tests of difference between types of housing assistance show a) significant differences for income when collapsing the bottom 3 income categories on the table to $0-$1,000 (chi-square statistic is 6.26; $p < .05$.); b) non-significant differences ($p>.05$) for over/under poverty level distribution and change in income status; significant differences for dichotomous (yes/no) employment (chi-square statistic of 6.94; $p < .01$) and unemployment (chi-square statistic of 4.06; $p < .05$) measures. Some households have multiple income sources.
3) In some cases, income may have included SNAP benefits, which are not customarily considered as income but which might, in some cases, have been included as such in the data.
Source: University of Delaware analysis of exit surveys

When interpreting the income and employment results, it is important to consider the impact of the COVID-19 pandemic, which began toward the end of the research study. Loss of jobs and child care, and difficulty finding jobs and child care, were the most commonly reported impacts of the pandemic.

Figure 18. **Impacts of COVID-19 pandemic on HBAH participants** (intervention group)

	Total (n=49)
Percent who reported each COVID-19 impact	
Job loss	22 (45%)
Difficulty finding work	14 (29%)
Loss of child care	5 (10%)
Difficulty finding child care	10 (20%)
Mental health issues	2 (4%)
Domestic violence	2 (4%)
Infected/exposed to COVID-19	2 (4%)
Online education issues	5 (10%)
Family deaths due to COVID-19	2 (4%)
Housing issues	3 (6%)
Transportation issues	2 (4%)
Pregnancy	1 (2%)
No substantial impact	11 (22%)

Notes: Ten participants had not yet exited from HBAH when survey data was collected
Source: University of Delaware

Housing cost at exit differed considerably by group (see figure 19). The median monthly housing cost for participants with ongoing assistance was $150 (including rent and utilities). Those with time-limited assistance, on the other hand, had a median monthly rent of $820. This is not surprising, as the step-down assistance structure tapered the housing assistance to market levels by the end of HBAH participation for that group. Participants with ongoing assistance continued to pay approximately one-third of their income for housing. The structure of ongoing rental assistance restricts housing costs to approximately one-third of income, while those without ongoing rental assistance pay fair market rent, which often is much higher than one-third of income.

Many families faced a high housing cost burden when their time-limited assistance ended. Cost burden was not calculated for families with zero income.

Figure 19. **Monthly participant housing cost at exit, grouped by type of housing assistance for HBAH participants** (intervention group)

	Ongoing housing assistance (n=27)	**Time-limited housing assistance** (n=22)	**Total** (n=49)
Housing cost (rent and utilities)			
$0 - $20	9 (33%)	4 (18%)	13 (27%)
$36 - $345	11 (41%)	0 (0%)	11 (22%)
$500 - $999	7 (26%)	12 (55%)	19 (39%)
$1,000 – $1,470	0 (0%)	6 (28%)	6 (12%)
Median housing cost	$150	$820	$345
Burden (housing cost as percent of income)			
No cost burden (<30% of income)	7 (26%)	3 (14%)	10 (20%)
Cost burden (30% to 49% of income)	6 (22%)	5 (23%)	11 (22%)
Severe cost burden (50% of income or more)	5 (19%)	7 (32%)	12 (24%)
Zero income	9 (33%)	7 (32%)	16 (33%)

Note: Differences in outcomes in this figure were not tested for statistical significance
Source: University of Delaware

Food security

At the end of the study, 13% of all HBAH families reported concerns about being hungry or running out of food. There did not appear to be any difference between the intervention and control group regarding the percent of families that had to reduce the size of, or skip, meals.

Figure 20. **Intervention and control group participant food security outcomes at 22-months after enrollment**

	Intervention group (n=38)	**Control group** (n=30)	**Total** (n=68)
Do you have any concerns about being hungry or running out of food? Yes	*	*	9 (13%)
Since last month, did you or other adults in your household ever cut the size of your meals or skip meals? Yes	6 (16%)	5 (17%)	11 (16%)

Note: Differences in outcomes in this figure were not tested for statistical significance
*Total not disaggregated by intervention and control
Source: Nationwide Children's Hospital analysis of 22-month surveys

Process evaluation

Based on a document review and key-informant interviews with HBAH participants and partners, the initial Health Policy Institute of Ohio (HPIO) process evaluation identified the following key findings:

Cross-sector partnership is challenging, but worth it

Persistent collaboration. The partnership between housing and health organizations was extremely beneficial, both to the organizations and participant families. All the contributing organizations remained committed to HBAH throughout the project. Together, the partners were able to generate new resources for families and to learn from each other's perspectives.

Partnership challenges. The difficulties of communicating across agencies and overcoming bureaucratic hurdles caused by system differences were daunting. Partnership challenges included:

- Lack of role clarity for some partners, particularly at the beginning of the research project
- Difficulties with data sharing and the randomized control trial process
- Unrealistic expectations about how quickly the research project could get up and running, including enrollment process hurdles

HBAH partners, in their own words

"The success of partners coming together from the private and public sector [has] shown that the more they come together, the better the outcomes achieved."

"There is a level of courteousness among the providers because of their commitment to the participants. There is an attitude of 'we're going to do what it takes.'"

"I was fuzzy on the role and responsibilities of two other agencies. Their services overlap with ours. We started to have issues with role clarity… We had tough times in the beginning, but it got better."

Resilient participants formed strong relationships with Housing Stability Specialists, a critical component of the project

Hope for the future. Participants made the most of HBAH resources, including active engagement with education and employment programs, HBAH workshops and behavioral health treatment, despite the many challenges in their lives. In interviews, several mothers expressed a positive outlook and a renewed sense of hope that HBAH had given them the opportunity to help their children grow up healthy and safe.

Critical role of Housing Stability Specialist (HSS). Most participants viewed their HFF caseworker as the primary point of contact for HBAH. They described very positive, affirming and close relationships with their HSS and reported that they were respectful, empowering and good at communicating and following through on plans and promises.

Thanks to their flexibility, skills, frequent communications and knowledge of how to access community resources, HSSs served as an effective "one-stop-shop" for participants, as well as a solid source of emotional support and coaching. HFF's organizational knowledge of how to navigate the Columbus housing market was extremely valuable. HSSs coached participants on how to find and keep apartments and negotiated with landlords on their behalf.

HBAH participants, in their own words

"The program has really helped me to get my life back on track and provide stability to my children."

"I can call [HFF HSS] and talk to her about anything. She answers questions. Apart from their case worker role, they are good mentors too … They teach you not just how to be a mom, but how to be a good woman for yourself. Especially if you have a daughter, you must teach her how to be a better version of you."

"[HFF HSS] knows where to get good furniture and where to get a car when it's time for me to buy one. She told me about Turbo Tax. I didn't know what Turbo Tax was."

"I feel empowered to make decisions. I have shared personal information with [my HSS], and she respected me and made me feel safe."

Rental assistance is necessary, but not sufficient

Difficult housing market and low wages. Lack of affordable rental units, landlord discrimination and the mismatch between housing costs and wages in Columbus were the biggest external challenges to positive outcomes for HBAH families. Columbus has one of the hottest housing markets in the state, giving landlords little incentive to rent to lower-income families. Coupled with the problematic rental histories for some participants (evictions, utility bill arrears, etc.), HBAH families were not well-positioned to succeed in the private rental market without assistance.

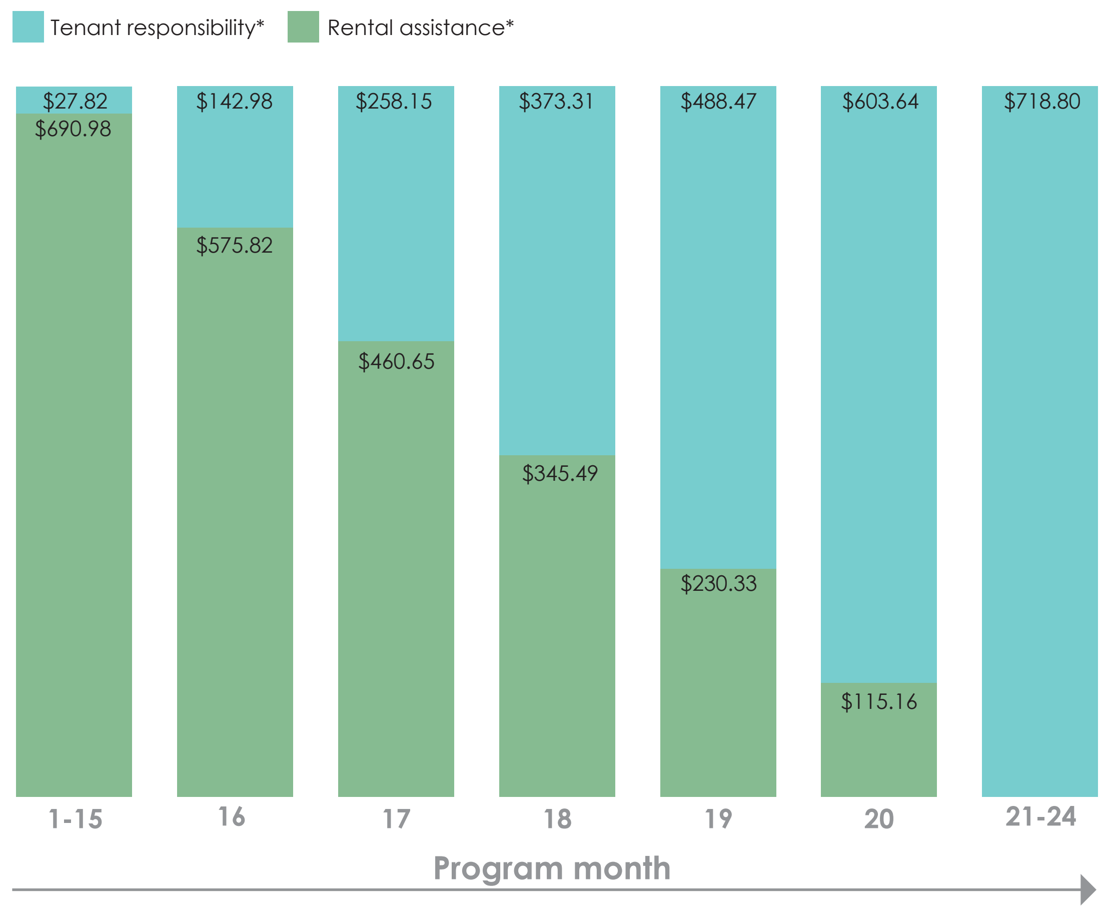
Rental assistance is a critical foundation. Given the challenges of being a pregnant woman with a low income trying to find an affordable apartment in Franklin County, the rental assistance provided by HBAH set the foundation for family stability. HBAH provided the following rental assistance over a 21-month period:

- Twenty-two families received time-limited assistance in privately-owned units. At month 16, these families entered the "step-down" phase where they became responsible for a larger portion of the monthly rent (see figure 21)
- Twenty-four families received ongoing assistance (e.g., project-based vouchers for units owned by CMHA or Community Properties of Ohio)
- Three families received long-term portable vouchers and were housed in private units

Intensive help beyond rental assistance was needed. Each family came to HBAH with a unique constellation of needs and strengths, many shouldering the weight of trauma and deep poverty. At baseline, mothers had many barriers to housing stability, such as having no credit score (54%), history of criminal justice involvement (44%) or no income (46%) (see figure 6 on p. 15). Many also had behavioral health conditions and were experiencing intimate partner violence.

The HBAH model anticipated the need for comprehensive supports, including landlord mediation, care coordination, job coaching, health education provided by community health workers and referrals to transportation, education and mental health services. The housing stabilization services followed many components of Family Critical Time Intervention, an evidence-based case management model grounded in Housing First practices that provides emotional and practical support during the transition to stable housing. Person-centered planning, motivational interviewing and trauma-informed care were also incorporated into the model to ensure that services were relevant and culturally responsive.

Figure 21. **Example of rental assistance step-down schedule as outlined in research project model**



*Calculated based on average fair market rent for units occupied by HBAH participants ($718.80 per month) and average tenant responsibility ($27.82 per month). These amounts were reported to HPIO by CelebrateOne. Calculations were based on these averages through the formula used to identify tenant rent portion by CMHA.

HBAH participants, in their own words

"They [HSS] stay on me. I need to do an eye exam and they keep following up with me to go get it done. I get good information – they send me info in the mail and call and text me."

"They [HSS] understand me well. They listen to you … Honesty. They don't sugar-coat it, and it pushes me. Just honesty and being blunt with me.

"I like the honesty … I've learned a lot from this program. Being able to trust other people allows you to trust judgement in yourself."

"I don't like my neighborhood. I don't like where I live … I don't feel comfortable [because a neighbor's boyfriend is abusive and threatening]."

"Housing is the key. I kept trying and failing to save. But they gave you this opportunity to start fresh. That was a blessing."

HBAH partners, in their own words

"The delivery of any of the services is futile without housing. Housing is necessary, but not enough…"

"The housing sector is completely new to me. I didn't realize how complicated and difficult it could be to get these women housed."

"[Some] landlords were not willing to take the risk, even with CMHA vouching for them."

Racism, trauma and violence must be addressed

Systemic racism. Most participants (92%) were Black. Historical and contemporary racist housing policies, residential segregation and neighborhood disinvestment all serve as significant external barriers to housing stability and positive health outcomes.

Trauma and violence. Almost all HBAH intervention group families found housing within CelebrateOne priority neighborhoods. Identified because of their high infant mortality rates, these areas also have higher rates of poverty and crime. Some participants reported that they did not like the neighborhood they were living in, often because of violent neighbors. Many also experienced intimate partner violence; several requested moves to new units that were allowable thanks to provisions of the Violence Against Women Act (VAWA).

Process evaluation supplement: COVID-19 pandemic and step-down process

The initial process evaluation conducted by HPIO drew upon information primarily collected before the COVID-19 pandemic and prior to the end of the study. To fully describe the final phase of the project and the impact of the pandemic on HBAH families, CelebrateOne re-engaged HPIO in February 2021 to conduct additional key-informant interviews and document review to explore the impact of the COVID-19 pandemic and recession on HBAH participants and service delivery, and to describe the step-down and aftercare phases of the project, including an understanding of how the transition to market-rate rents affected the 22 HBAH families who did not have ongoing assistance.

The supplemental report identified the following lessons learned:

Implications for interpreting outcomes. The following factors should be kept in mind when interpreting the health and housing outcome evaluation results:

- All HBAH babies were born prior to the pandemic, so the pandemic did not affect the birth outcomes that were evaluated as part of the HBAH research study. (Although some participants had a subsequent pregnancy during the pandemic, the health outcomes for these infants were not included in the health outcome evaluation conducted by NCH.)
- The pandemic disrupted child care arrangements and employment, making it difficult for some families to earn an adequate income by the end of the study.
- The pandemic also resulted in an influx of resources that moderated the impact of the disruption on families and allowed HFF to extend services longer than initially planned.
- Families with ongoing housing assistance exited the study with very different prospects for long-term housing stability compared to those with time-limited assistance. Additional analysis of health and housing outcomes by rental subsidy status would be meaningful, although the small sample size would limit the generalizability of any group differences in outcomes.

Considerations for the HBAH model. Key informant feedback indicates that the following modifications to the HBAH model should be considered:

- Re-assess the pre-set structure of the step-down schedule (predetermined monthly payment schedule) and explore a more individualized approach, such as progressive engagement (a more individualized way of adjusting assistance based on changes in the client's income and other factors).
- Maximize the use of ongoing rental subsidies.

- Provide intensive employment and job training services for participants.
- Advocate for policy changes to improve community conditions, including increased wages and access to child care and self-sufficient employment opportunities.

In addition, advocacy efforts should focus on policy changes to address racism and inequities affecting families of color, such as employment and housing discrimination and criminal justice system practices.

Conclusions

The overall conclusion of the HBAH study was that providing rental assistance and intensive housing stabilization services to very low-income families is a promising approach to improving infant health, reducing Medicaid spending and increasing housing stability. Due to the small size of the study, it is not possible to definitively assess the impact of HBAH on birth outcomes and infant mortality. However, positive process and outcome evaluation results gathered from a variety of sources indicate that most HBAH participants were highly satisfied with the project and that participants were more likely than control group families to experience improved housing stability, fewer adverse birth outcomes and reduced healthcare spending.

The following key findings summarize the most notable evaluation results and considerations for future efforts to improve maternal and infant health through housing interventions.

HBAH contributed to large reductions in Medicaid spending, while impacts on health outcomes were more difficult to assess.

Medicaid spending. Analysis of Medicaid claims data within the randomized control trial design demonstrated that HBAH participants had far lower healthcare spending than the control group households (who did not receive rental assistance). For example, the average spending for infants at the time of delivery was $4,175 for the intervention group compared to $21,521 for the control group, largely driven by lower neonatal intensive care unit (NICU) utilization among intervention group infants.

Maternal and infant health. Forty of the 51 live births in the intervention group (78%) were infants born full-term at a healthy weight, compared to 24 of 44 in the control group (55%). While these results were promising, they were not statistically significant due to the study size. A study with a larger number of participants is needed to better assess the effectiveness of the HBAH model in improving birth outcomes.

There were no notable differences in self-reported maternal health outcomes.

2 HBAH improved housing stability.

Housing status and shelter use. All HBAH participants lacked stable housing upon being accepted into HBAH, and all obtained affordable, safe apartments which eliminated housing insecurity for the course of their HBAH participation. Once housed, the majority of HBAH intervention group participants maintained their housing with limited documented difficulties. Intervention group participants were much less likely than control group participants to have spent time in a homeless shelter during or after enrollment in the project. For the intervention group, total household days in a shelter declined from 695 prior to HBAH enrollment (9/2016 to 9/2018), to 77 during enrollment to zero within the post-enrollment period; compared to 834, 436 and 114 days, respectively, for the control group.

Future housing stability. Over two-thirds of the HBAH households had reasonably good prospects for maintaining their housing as they exited the study. The housing evaluation determined that 35% of the HBAH households were "stably housed" and another 37% were "stably housed with some concerns" at exit. Families with ongoing rental assistance (rather than time-limited assistance that ended at exit) faced a much lower threat of instability when they left the study.

Ongoing rental assistance and intensive housing stabilization services are critical for families at high risk for infant mortality.

Rental assistance is a critical foundation. At baseline, mothers had many barriers to housing stability, such as having a bad, poor or no credit score (96%), history of criminal justice involvement (48%), no income (46%) and electric bill arrears (60%). The 21-24 months of rental assistance—as well as intensive help to find and maintain housing—provided a critical foundation for the women to care for their newborns and prepare for long-term stability.

Barriers point to depth of need. It took an average of 62 days to secure housing for families after enrollment, reflecting the extreme difficulty of finding affordable housing in Franklin County. Even with the extensive support provided through HBAH, 35% of intervention group families moved at least once during the study, and 45% had at least one lease violation. Domestic violence was a contributing factor in 41% of the moves.

Using Housing First and harm reduction approaches, the housing stability specialists were able to help participants through these challenges to ensure they remained safely housed. Participants reported a high degree of satisfaction with this support, describing their caseworkers as respectful, empowering and highly knowledgeable about how to navigate housing and social service resources.

HBAH families faced substantial economic challenges that were exacerbated by the COVID-19 pandemic.

Low wages and difficult housing market. At baseline, 34% of the women in the intervention group did not have a high school diploma or GED and, among those who were working, low-wage jobs in the service sector were common. The gap between the income of HBAH families and the cost of housing in Franklin County was stark. At exit, 33% of families reported no income, down from 46% at baseline. By the end of the study, the median monthly income of participants was $700. Given that the median fair market rent for a 2-bedroom apartment in Franklin County in 2020 was $992, HBAH families face enormous challenges to housing stability in the absence of ongoing rental assistance.

Pandemic job loss and child care shortages. The COVID-19 pandemic destabilized employment progress made by many families. Almost half of the women (45%) reported job loss as a result of the pandemic, and 30% reported loss of child care and/or difficulty finding child care due to the pandemic.

5 Racism, trauma and violence must be addressed.

Systemic racism and housing segregation. HBAH focused its recruitment in **CelebrateOne priority zip codes**, which have high rates of infant mortality. Most HBAH participants (92%), therefore, were Black/African American, reflecting residential racial segregation in Columbus and higher rates of housing cost burden and homelessness among Black/African American families in these communities. Historic and present day racist housing policies, residential segregation and neighborhood disinvestment have contributed to poor health outcomes in the CelebrateOne priority neighborhoods.

At exit, over half of HBAH participants (61%) were living in zip codes that were majority Black and/or high poverty (57% of families living in zip codes where >30% of households live below the poverty line). Notably, participants with time-limited housing assistance were less likely to be living in these segregated, high-poverty zip codes, indicating that some families had to choose between housing stability in a high-poverty area or a potentially higher housing cost burden in a more mixed income "high-opportunity neighborhood."

Trauma and violence. The neighborhoods that many HBAH families live in also have higher rates of crime and violence. Some participants reported that they did not like the neighborhood they were living in, often because of violent neighbors. Many also experienced domestic violence during or prior to participating in the study.

Recommendations

The following recommendations are informed by the evaluation results and expertise of the HBAH partners and research team.

HBAH replication

The comprehensive HBAH model was created to test the impact of providing housing, housing stabilization and other services to pregnant women with extremely low incomes. While the scale of this research project pilot was small, positive outcomes were achieved, and the key findings illuminate recommendations for leaders, planners and funders interested in replicating HBAH to consider:

1. **Equity.** Prioritize replication in communities with high rates of infant mortality and persistent racial disparities in health outcomes and housing instability. Replicate and evaluate HBAH as part of a broader effort to eliminate infant mortality disparities through:
   a. Community engagement and inclusion of women with lived experience of housing instability in planning and decision making
   b. Culturally appropriate services
   c. Housing choices for families, including options to move out of high-infant mortality zip codes and into high-opportunity neighborhoods
   d. Resource allocation that is targeted and tailored to communities with greatest need
   e. Mitigate the impact of racist and other discriminatory policies and practices, such as exclusionary zoning and source of income discrimination
   f. Evaluation of outcomes disaggregated by race and ethnicity (when applicable)
2. **Replication and evaluation.** Replicate the HBAH model at greater scale and in other communities with rigorous evaluation to better understand the impact of the project on health outcomes, health equity, healthcare spending and long-term housing stability (see the **Replication Template** for additional guidance):
   a. Federal agencies can invest in a multi-site national research study
   b. Ohio state agencies can invest in a multi-site study in Ohio
   c. Philanthropic partners can contribute support for replication and evaluation at the national and/or state level
3. **Fidelity.** Ensure fidelity to the following key components of the HBAH pilot study model:
   a. Rental assistance for pregnant women for at least 24 months, including rental vouchers and housing assistance that maintains a subsidy after study exit (when available)
   b. Intensive housing stabilization services for at least 24 months—including landlord advocacy, utility assistance and care coordination—tailored to meet the needs of pregnant women of color and others at high risk for homelessness and poor birth outcomes
   c. Person-centered, trauma-informed support consistent with Housing First and harm reduction approaches
   d. Formalized and funded collaboration between housing and maternal and child health organizations with different strengths and expertise
   e. Clearly defined partner roles, including a backbone organization to coordinate activities and build collaboration across all partner organizations (see the **Replication Template** for additional guidance)

Policy changes

In addition to HBAH replication, broader policy changes are needed to improve housing access and health outcomes for families with low incomes. Partners involved in HBAH have identified the following policy recommendations that can be made at the local, state and/or federal level by public and private entities. Experience with HBAH indicates that these policy actions would contribute to better outcomes for HBAH families, as well as other pregnant women and families with young children who struggle with housing instability and homelessness.

HBAH is needed because these policy issues have not yet been adequately addressed. If these policy changes are accomplished, the need for intensive interventions, like those implemented as a part of the HBAH pilot study, will be mitigated.

Policy changes to improve housing stability for families with extremely low incomes

4. **Equity.** Public and private entities at the federal, state and local level can prioritize housing stability services, including rental assistance, for communities with high rates of infant mortality and persistent racial disparities in health outcomes and housing instability.
5. **Rental and other housing assistance.** Public and private entities at the federal, state and local level can provide targeted rental and utility assistance to pregnant women at high risk of infant mortality. This could be accomplished in several ways:
   a. Advocate for more federal funding to provide rental assistance (e.g., Housing Choice Vouchers) to support programs that serve pregnant women at high risk of infant mortality
   b. Provide rental assistance from the Ohio Housing Trust Fund or other state or federal funding sources (e.g., **HOME Tenant-Based Rental Assistance**) to support programs that serve pregnant women at high risk of infant mortality
   c. Encourage public housing authorities to set-aside housing choice or other special purpose vouchers and/or prioritize public and/or assisted housing for pregnant women at high risk of infant mortality
6. **Housing stability services.** Public and private entities at the state and local level can support implementation of housing stability services into healthcare and social services, which are paired with rental and other housing assistance provided to extremely low-income pregnant women who are at risk of infant mortality. This could be accomplished in several ways:
   a. Advocate for the U.S. Department of Health and Human Services to create recommendations and guidance on how housing stability services can be provided to pregnant women with low incomes who are at risk of adverse birth outcomes (similar to guidance provided for chronic homelessness)
   b. Leverage Medicaid and expand other sustainable state funding streams to expand housing stability services
   c. Encourage Medicaid managed care organizations (MCOs) to develop and implement "in lieu of services" packages that include housing assistance
   d. Engage health system stakeholders, such as MCOs, to fund housing stability specialists for high-risk pregnant women to partner with housing partners to deliver rental and other housing assistance
   e. Advocate for more federal funding to provide rental assistance (e.g., Housing Choice Vouchers) to support programs that serve pregnant women at high risk of infant mortality

Policy changes to improve supply of affordable housing

7. **Equity.** Local policymakers can increase the supply of affordable housing in high-opportunity neighborhoods by implementing inclusionary zoning and streamlining housing development approval processes.
8. **Housing units.** Public and private entities at the state and local level can increase the supply of quality affordable housing units through investment in new construction or renovation of existing units. This could be accomplished in several ways:
   a. Provide Ohio Housing Finance Agency (OHFA) and/or local incentives for developers who are competing for housing credits to establish partnerships with housing authorities and housing stability providers that serve pregnant women at high risk of infant mortality
   b. Encourage healthcare systems and health insurance companies to invest in affordable rental housing and reserve units for programs that serve pregnant women at high risk of infant mortality
   c. Advocate for more federal investment in affordable rental housing, including advocacy to make Housing Choice Vouchers (and/or other housing assistance) available to everyone who qualifies (eliminate waitlists by making this benefit an entitlement)

9. **Property owners.** Local governments can increase the number of property owners willing to rent units to families with very low incomes. This could be accomplished in several ways:
   a. Require property owners to remove discriminatory practices (such as source of income exclusions) so that pregnant women at high risk of infant mortality can have equitable access to affordable housing
   b. Encourage landlords to offer and maintain affordable rental units through tax incentives and damage insurance funds
   c. Enact mediation requirements before filing evictions due to non-payment of rent for any landlord that owns two or more properties

Policy changes to increase employment and income

The following policies are most critical for supporting family economic stability, which is foundational for housing stability:

10. **Equity.** Local policymakers can prioritize communities of color and families with young children when making decisions about child care, transportation and job training resources.
11. **Wages.** State and local policymakers can increase access to self-sufficient wages:
    a. Increase the minimum wage and/or encourage employers to offer living wages
    b. Incentivize or require employers that receive tax abatements to hire workers from the local community
    c. Make the Ohio Earned Income Tax Credit (EITC) refundable
12. **Child care subsidies.** State policymakers can strengthen Ohio's child care subsidy to ensure that affordable, high-quality child care services are available for families with extremely low incomes:
    a. Streamline and expedite access to child care subsidies by reducing bureaucratic complexity of the application and allowing the subsidy to be secured while a parent is seeking employment and beginning a new job
    b. Increase Ohio's child care subsidy eligibility requirement to at least 200% of the Federal Poverty Guideline

In addition, the following issues should be addressed to support housing stability:

13. **Collateral sanctions.** State and local policymakers can reduce legal barriers that prevent people with criminal records from getting jobs
    a. Eliminate excessive sanctions, expand use of Certificates of Qualification for Employment and other criminal justice reforms
    b. Ensure that initiatives to recruit employers to accept applicants with criminal backgrounds focus on a wide range of sectors, including businesses that are more likely to hire women
14. **Transportation.** Local policymakers and transit agencies can strengthen local transportation access:
    a. Increase bus routes and improve bus route frequency to better connect workers to jobs and child care
    b. Provide reduced fare or free transportation for vulnerable populations, such as pregnant women with low incomes, to access health and housing services
15. **Education and job training.** State and local policymakers can promote opportunities to increase educational attainment and workforce development to help extremely low-income households attain and maintain financial stability:
    a. Increase public investment in job training programs and work supports for low-income families
    b. Improve access to existing job training programs and supportive services like transportation and child care to increase utilization by pregnant and parenting mothers
16. **Medicaid access and continuity.** State policymakers can support Medicaid access for families at risk of infant mortality by:
    a. Maintaining current eligibility levels for pregnant women and Group VIII (Medicaid expansion)
    b. Extending 12-month continuous post-partum coverage for all Medicaid enrollees who have delivered a child
    c. Reducing administrative barriers to Medicaid, including improvements to the Ohio Benefits self-service portal

Notes

1. One participant withdrew from the study after enrollment. For this reason, most reported data after baseline is for 49 women, rather than 50.
2. Data from the Department of Housing and Urban Development FY2020 Fair Market Rent, as compiled by the National Low Income Housing Coalition. "Out of Reach 2020: Ohio." National Low Income Housing Coalition. Accessed July 22, 2020. https://reports.nlihc.org/oor/ohio
3. Fetal death refers to "the spontaneous intrauterine death of a fetus at any time during pregnancy." Fetal deaths later in pregnancy (at 20 weeks of gestation or more, or 28 weeks or more, for example) are also sometimes referred to as "stillbirths." Source: U.S. Centers for Disease Control and Prevention.