

Assessment of Economic Opportunity Metrics for HUD-Assisted Renters

Multidisciplinary
Research Team



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FOREWORD

We are pleased to provide this report on how the U.S. Department of Housing and Urban Development (HUD) can make better use of administrative data to follow the progress of work-able, rent-assisted tenants as they pursue self-sufficiency.

It is a major strategic priority of the Department that work-able tenants of public and assisted housing take full advantage of the economic opportunities available to them in their community. Most rigorous research has found that assisted housing by itself will not lead toward increased work and may have some modest negative impacts on work.

Assisted housing has been found to have extremely powerful effects of permanently ending homeless spells, improving health, reducing domestic violence victimization, reducing hunger, and improving school stability for children. It has also been found to have a positive economic impact for the children of assisted housing tenants when they become adults.

For the adults, however, housing assistance alone has not been shown to improve either employment rates or earned income. Some studies have shown housing assistance to reduce work effort.

How do we take advantage of the positive benefits of housing stability while also improving economic impacts for the adults? Research shows that when tenants take advantage of community resources, they can have improved economic outcomes. For example, HUD's Jobs Plus program provides a set of work supports that have been shown to have strong positive impacts on employment outcomes. Housing agencies, however, can play only a small role. Tenants need to be offered, and take advantage of, the variety of supports available in the larger community.

The purpose of this study was to develop four indicators that could be used to track and measure the extent to which work-able individuals and households in HUD programs are participating in work and making progress toward self-sufficiency. An important innovation used in two of these indicators is to contextualize them with census data by measuring employment outcomes of HUD populations as a proportion of similar adults in their metropolitan areas. This approach provides important context about local employment conditions that may affect HUD results.

The data show that assisted work-able adults, consistent with their disadvantaged backgrounds, are employed at about 59 percent of the rate for the work-able population in their regions, that they partially narrowed this gap in the wake of the recession, and that regional and programmatic variations in relative work participation can be substantial.

The work provides proof of concept that such indicators can characterize work participation of assisted households in multiple useful ways: at the national and program levels, for housing providers of specific regions, and over time. As a result, HUD can readily use these indicators or enhanced versions of them to guide further research on why tenants in some areas are exceeding expectations—for example, to identify if practices for connecting residents to job opportunities are responsible for those results, as well as why tenants in other areas are doing worse than expectations—to assess whether technical

assistance to facilitate local adoption of proven best practices would be effective in producing better outcomes.

A handwritten signature in black ink, appearing to read 'S. Appleton', with a long, sweeping horizontal line extending to the right.

Seth D. Appleton
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EXECUTIVE SUMMARY

In 2016, nearly 4.5 million households¹ received housing assistance from the U.S. Department of Housing and Urban Development (HUD) across the three programs of interest in this study: public housing, housing choice voucher (HCV), and assisted multifamily.² These programs are intended to aid low-income families and individuals in finding safe, decent, and affordable housing and have the potential to assist work-able program participants in achieving the goals of ***economic opportunity, self-sufficiency, and financial stability***. Reliable metrics are a critical tool for evidence-based management and oversight. Such metrics must offer value in informing strategy and policy, managing programs to improve outcomes, and improving public accountability.

The purpose of this study is to estimate and assess four indicators of economic opportunity for assisted populations that offer a degree of balance and that integrate additional information to contextualize program performance:

- **Indicator 1** is the ratio of the employment rate for the work-able, HUD-assisted population to the employment rate for the work-able general population.³
- **Indicator 2** is the percentage of work-able, HUD-assisted households with stable employment for 3 years.
- **Indicator 3** is the ratio of the full-time employment rate for the work-able, HUD-assisted population to the full-time employment rate for the work-able general population.
- **Indicator 4** is the percentage of work-able, HUD-assisted individuals who are either employed or in school.

Using HUD administrative data, combined with data from the American Community Survey (ACS), the study team provides estimates for each of the four indicators for the three programs of interest at the national level and for every metropolitan statistical area (MSA) (and the nonmetropolitan balance of each state) for 2012 through 2016. Exhibit ES-1 illustrates those estimates for 2016 (darker shades of green indicate higher values).

The national estimates for the four indicators of economic opportunity show increases in the financial stability and self-sufficiency of HUD-assisted, work-able households and individuals. Although we observe increases in all four metrics over time,⁴ estimates for each indicator are considerably higher for individuals in public housing and HCV programs compared with those in assisted multifamily programs. Furthermore, estimates of Indicators 1 and 3 suggest a convergence between the employment

¹ Descriptive analysis from HUD administrative data indicates that nearly 4.5 million households were in one of the three HUD-assisted programs of interest (public housing, HCV, and assisted multifamily programs) in all 50 states plus the District of Columbia in 2016, with approximately 3.1 million work-able individuals residing in 2.1 million work-able households. This total excludes (1) those households that participated in programs other than the three programs of interest; (2) those households that ended participation in one of the HUD programs of interest during the calendar year; and (3) those households without geographic identifiers in the HUD longitudinal data file.

² For convenience in this report, the “assisted multifamily program” actually refers to a number of subsidized and assisted housing programs involving private ownership.

³ Work-able individuals are nonelderly (ages 18 through 64) and nondisabled; work-able households are any households that have at least one work-able individual.

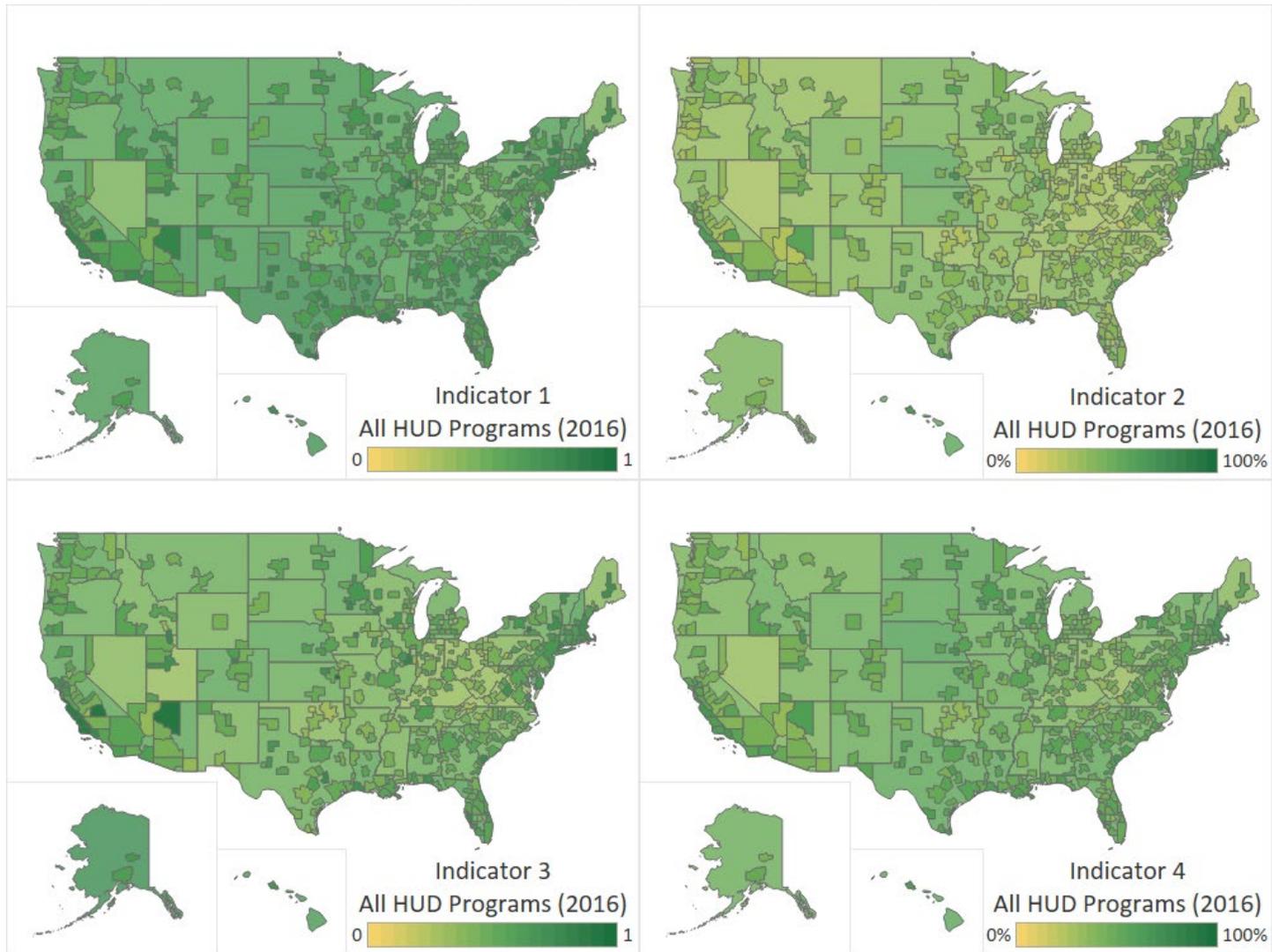
⁴ Because the indicators are estimated for the entire universe of households meeting the criteria, there is no sampling error, and all reported differences are statistically significant. Other sources of error, however, may influence reported results.

outcomes of HUD-assisted, work-able individuals and the general population over time. The estimates of Indicators 2 and 4 suggest that economic and educational opportunity, as well as financial stability, are also increasing over time.

This study notes some of the results, differences, and trends that are apparent from examining the indicators. It does not, however, attempt to investigate or disentangle the numerous factors that could cause or influence the results seen.

These indicators are promising metrics of economic opportunity that may help policymakers, program managers, and stakeholders; however, we caution the reader that certain data limitations on these estimates should be considered when interpreting the results. Nonetheless, the findings from this study provide key insights into estimating indicators of financial stability, economic self-sufficiency, and economic opportunity for HUD-assisted populations. The indicators illustrate that the labor market and employment characteristics of the HUD-assisted population have improved since 2012. The indicators can be helpful in assessing the economic opportunities of the HUD-assisted population and can be easily adapted to monitoring and evaluating outcomes for individual housing providers' tenants. The indicators also may have applications for other HUD programs geared toward providing employment opportunities, thereby supporting the goals of increasing self-sufficiency and financial stability among HUD-assisted populations.

Exhibit ES-1 | Estimates of Economic Opportunity Indicators Across All HUD Programs, 2016



Sources: ACS 5-year estimates; HUD Inventory Management System (IMS)/Public and Indian Housing Information Center (PIC), and Tenant Rental Assistance Certification System (TRACS) data from the HUD longitudinal tenant data files

1 INTRODUCTION

The U.S. Department of Housing and Urban Development (HUD) is interested in estimating metrics used to assess the status and progress in achieving *economic opportunity, self-sufficiency, and financial stability* for work-able individuals receiving various housing benefits. The need for such metrics is derived from HUD’s 2018–2022 Strategic Plan (HUD, 2018c), which outlines the Agency Priority Goal (APG) of “[promoting] economic opportunity for HUD-assisted residents by encouraging self-sufficiency and financial stability, as measured by increasing the proportion of households who exit HUD-assisted housing for positive reasons.” If available, those metrics can shed light on the extent to which HUD programs provide program participants and their families a path to self-sufficiency and financial stability.

Through its programs, HUD actively seeks to improve the economic opportunities of those receiving assistance by supporting local services that improve education and training, workforce development, and financial literacy. The Strategic Plan outlines three tracking indicators to measure success toward meeting this APG of individuals and households exiting the program from a financially stable position. These tracking indicators are—

1. Proportion of households exiting assisted housing for positive reasons.
2. Percentage of work-able households exiting assisted housing with low subsidy needs.
3. Median percentage change in income of individuals who complete an economic development program.

At present, HUD does not consistently collect data on the reasons that program participants exit the programs. Each of the three tracking indicators faces limitations due to data availability, scope, and timeliness. Because of these limitations, HUD has identified four alternative indicators of self-sufficiency, shown in Exhibit 1-1.

This report provides estimates for the four indicators for each of the following three types of programs: (1) public housing, (2) housing choice voucher (HCV), and (3) assisted multifamily programs⁵ from 2012 through 2016 and aggregated across the three programs for—

- Metropolitan statistical areas (MSAs) and the nonmetropolitan balance of each state.⁶

⁵ Assisted multifamily programs include Project-Based Section 8, Rent Supplement, Rental Assistance Payments (RAP), HUD-Owned or Held, Section 202 Project Rental Assistance Contract (PRAC), Section 811 PRAC, and Section 202/162 PRAC. Section 236 and Below Market Interest Rate unassisted multifamily subsidy types are not included because their tenants do not receive income-based rent assistance as do other program participants. Moderate Rehabilitation program participants also are excluded from this analysis. See “Programs of HUD” (HUD, 2018b) for further information regarding HUD’s various housing assistance programs: <https://www.huduser.gov/portal/sites/default/files/pdf/HUDPrograms2018.pdf>.

⁶ According to the U.S. Census Bureau (Census), MSAs are Core Based Statistical Areas (CBSAs) “associated with at least one urbanized area that has a population of at least 50,000. The [MSA] comprises the central county or counties or equivalent entities containing the core, plus adjacent outlying counties having a high degree of social and economic integration with the central county or counties as measured through commuting.” In contrast, micropolitan statistical areas are CBSAs with at least one urban cluster that have a population of at least 10,000 but less than 50,000. See Census’s “Geographic Terms and Concepts—Core Based Statistical Areas and Related Statistical Areas” (U.S. Census Bureau, n.d.) for further clarification: https://www.census.gov/geo/reference/gtc/gtc_cbsa.html.

- A summary national measure averaging the metropolitan and nonmetropolitan estimates weighted by the number of households served within that program in that area.

For the rest of the report, the term “MSAs” is used to refer to estimates for MSAs as well as estimates for the nonmetropolitan balance of each state.

Exhibit 1-1 | Alternative Indicators of Self-Sufficiency

Alternative Indicator	Description	Measure	
		Numerator	Denominator
Indicator 1	Ratio between HUD-assisted and overall population employment rates for work-able adults	Percentage of HUD-assisted, nonelderly, nondisabled adults who have earned income	Percentage of nonelderly, nondisabled adults who are employed in the general population
Indicator 2	Percentage of work-able, HUD-assisted households with stable employment for 3 years	Number of HUD-assisted, nonelderly, nondisabled households that have stable earned income over the past 3 years	Number of HUD-assisted, nonelderly, nondisabled households that have been continuously assisted over the past 3 years
Indicator 3	Ratio between HUD-assisted and overall population rates of full-time employment for work-able adults	Percentage of HUD-assisted, nonelderly, nondisabled adults who have annual earnings of \$12,500 or greater ⁷	Percentage of nonelderly, nondisabled adults in the general population who have worked at least 35 hours per week on average for at least 50 weeks during the past year
Indicator 4	Percentage of HUD-assisted, work-able individuals who are either working or in school	Number of HUD-assisted, nonelderly, nondisabled individuals who are either working or in school	Number of HUD-assisted, nonelderly, nondisabled individuals

⁷ For comparability between HUD-assisted and overall population rates of full-time employment, we calculate the annual earnings for adults who work at least 35 hours per week for at least 50 weeks per year at the minimum wage (\$12,687.50), which is the definition of full-time employment in the American Community Survey. We use a lower bound of annual earnings of \$12,500.00 for the HUD-assisted population (\$12,500.00 represents the wage income of just under 35 hours of work for at least 50 weeks per year at the 2018 federal minimum wage of \$7.25 per hour). In 2016, there were 9,957 (less than 0.5 percent) work-able individuals with annual wage income between \$12,500.00 and \$12,687.50 in the HUD-assisted population.

2 DATA SOURCES AND METHODOLOGY

To produce the four indicators described in Chapter 1, the study team used data from three main sources: the HUD Inventory Management System/Public and Indian Housing Information Center (IMS/PIC), the HUD Tenant Rental Assistance Certification System (TRACS), and the American Community Survey (ACS). HUD provided the IMS/PIC and TRACS records as a longitudinal dataset (hereafter, “HUD longitudinal data”) comprising annual files formatted consistently across programs and structured for longitudinal analysis.

2.1 Data Sources

HUD Longitudinal Data File. The study team used the HUD longitudinal data to calculate the total counts of work-able, HUD-assisted individuals and households. The longitudinal data file contains household member-level data for HUD-assisted households participating in public housing programs, housing choice voucher (HCV) programs, and multifamily programs. Data on households participating in public housing and HCV programs were collected from public housing authorities (PHAs) through forms HUD-50058 and HUD-50058 Moving to Work (MTW) using the IMS/PIC system. Data on households participating in multifamily programs were collected from private owners of multifamily properties through form HUD-50059 using the TRACS system. The longitudinal files based on the IMS/PIC and TRACS data include characteristics of households and household members, including addresses, assets and income, and participation in the three HUD programs of interest.⁸ The household addresses were geocoded to identify the metropolitan statistical area (MSA) locations of the households in the longitudinal data file. The data were cleaned to remove observations that lacked geographic information, data that were not associated with one of the three programs, and data that had an end-of-participation code.⁹

Indicators 1, 3, and 4 use member-level data to determine the share of work-able, HUD-assisted individuals who are employed, employed full-time, and either employed or in school full-time, respectively. Indicator 2 uses household-level data to determine the share of work-able, HUD-assisted households that have had stable employment for 3 years. Because this indicator estimates the population with 3 years of stable employment, 2012 was the first year for which indicator 2 could be estimated using the 2010–2016 longitudinal data.¹⁰

⁸ The data are separated into two files, a head-of-household file and a member file, which are merged to provide a member-level dataset of households for all three HUD programs.

⁹ See Appendix A for a more detailed accounting of the data-cleaning process.

¹⁰ Households associated with MTW PHAs are not excluded from this analysis. Because of different reporting requirements, the income data required for each of the indicators may be updated less frequently for participants in MTW than for other HUD assistance programs. Our analysis of the MTW share of households in the MSAs with an MTW PHA did not show that reporting requirements were an issue because the percentage of MTW households in the MSAs remained constant from 2012 through 2016. See Section 2.4 and Appendix D for clarification on the treatment of MTW PHAs.

ACS. ACS 5-year estimates provide data on local employment rates.¹¹ ACS is an annual survey of the U.S. population, conducted by the U.S. Census Bureau (Census), that collects social, economic, housing, and demographic characteristics for more than 2.1 million housing units across the country each year (U.S. Census Bureau, 2018a). From the ACS responses, Census publishes pretabulated social, economic, housing, and demographic estimates of the general or specified subpopulation.¹² After consulting with HUD, the study team decided to use ACS 5-year estimates.¹³ The team extracted ACS 5-year estimates for all 50 states plus the District of Columbia at the county level for a 5-year time span beginning with 2012 and used the data to calculate the employment and full-time employment rates of the work-able population. The ACS 5-year estimates provided data at more granular levels of geography and allowed for the aggregation of MSA and state-balance figures at the county level. Furthermore, the single 5-year estimate used for the indicator denominator for each MSA ensured that any observed changes during the period would be a reflection of changes in the program (numerator).

2.2 Methodology

In this section, we describe the key terms used in this report. Each of the four indicators is calculated for the **work-able population of nondisabled and nonelderly adults** in each MSA, along with a national-level weighted mean for each of the three programs. Appendix A outlines the variables and inclusion/exclusion criteria to restrict data in the longitudinal data file and to restrict ACS data to nondisabled and nonelderly adults. In Exhibit 2-1, we briefly summarize our definitions. Individuals are considered work-able if they are nondisabled and fall in the age range of 18 through 64.¹⁴ Employment status is determined by an annual wage income of \$500 or more, whereas full-time employment status is determined by an annual wage income of \$12,500 or more. Full-time student status is determined by an indicator variable in the longitudinal data that denotes whether a member of the household is a full-time student and 18 years or older.¹⁵ Households are considered work-able if any member of the household is work-able. Household employment is determined by a total household annual income of \$500 or more. In addition, important limitations exist in the variables selected or in their comparability across the HUD longitudinal data files and ACS estimates in this chapter. We describe those limitations in detail in Section 2.4.

¹¹ Given that 5-year estimates include previous years of ACS responses, notable weaknesses include the age of data and a resulting lack of year-to-year variation (U.S. Census Bureau, 2018b). The 1-year estimates are deemed unreliable for geographic areas encompassing fewer than 65,000 persons and are not published by Census (U.S. Census Bureau, 2018b). This threshold complicates the analysis of MSA and state-balance indicators due to the county-level delineation of MSAs and an MSA's defining threshold of 50,000 persons (U.S. Census Bureau, 2016).

¹² Following discussion with HUD, the study team used ACS tables C18120—Employment Status by Disability Status and C18121—Work Experience by Disability Status to calculate the employment and full-time employment rates of the nondisabled population ages 18 through 64.

¹³ The ACS 5-year estimates are based on 60-month data collections implemented via paper questionnaires, phone interviews, personal interviews, and Internet surveys. Over this 5-year timeframe, Census indicates that it “samples approximately 1-in-9 households nationwide” and notes that this sampling rate is higher in low-populated areas and intentionally targets areas with presumably low response rates (U.S. Census Bureau, 2018b).

¹⁴ HUD programs define elderly individuals as those older than 62 years, but this analysis includes individuals through the age of 64 to be consistent with ACS table categories (HUD, 2014; HUD PIH, 2004).

¹⁵ The variable *mbr_rlt_n_cd* is equal to “E” (for IMS/PIC) or “D” (for TRACS) if the household member is a full-time student.

Exhibit 2-1 | Definitions of Terms Used for Economic Opportunity Metrics

Indicator	Definition
Work-able Individual¹⁶	Nondisabled person ages 18 through 64
Work-able Household	Household with at least one individual who is work-able
Employment	For individuals, having earnings ¹⁷ greater than \$500 in a year ¹⁸
Stable Employment	For households, having total earnings greater than \$500 per year for the past 3 years
Full-Time Employment	For individuals, having earnings greater than \$12,500 for the past year ¹⁹
In School	For individuals, being reported as a full-time student

2.3 Specifics on the Estimation of Indicators of Economic Opportunity

This section provides a detailed outline of how the study team calculated estimates of the alternative indicators proposed by HUD. For each indicator, we note the methods for providing MSA-specific, program-specific, and national estimates.

INDICATOR 1—RATIO BETWEEN HUD-ASSISTED AND OVERALL POPULATION EMPLOYMENT RATES

Indicator 1 is the ratio of the employment rate for the work-able, HUD-assisted population to the employment rate for the overall population. It is calculated as follows:

$$\text{Indicator 1} = \frac{E_{HUD}/N_{HUD}}{E_{Gen}/N_{Gen}}$$

The variable E_{HUD} is the number of HUD-assisted, work-able, employed individuals, and N_{HUD} is the number of HUD-assisted, work-able individuals (regardless of employment status). The variables E_{HUD} and N_{HUD} are calculated for each program and MSA using the HUD longitudinal data file. Similarly, the variable E_{Gen} represents the number of work-able individuals who are employed in the general population (U.S. Census Bureau, 2017).²⁰ The variable N_{Gen} represents the number of work-able

¹⁶ The study team used two variables (age and disability status) to determine work-ability. Household members who were live-in aides and foster children or adults were included in the counts of work-able individuals. Such members accounted for approximately 1.3 percent of work-able households in 2016. Further details of the data-cleaning process and variables used to determine work-ability are outlined in Appendix A.

¹⁷ Wage income is derived from business income, federal wages, PHA wages, military pay, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD PIH, 2004; HUD, 2014).

¹⁸ The value \$500 represents just under 2 weeks of work at the 2018 federal minimum wage of \$7.25 per hour.

¹⁹ The value \$12,500 represents the lower bound of income for 1 year (at least 35 hours per week for at least 50 weeks, or 1,750 hours) of employment at the 2018 federal minimum wage of \$7.25 per hour.

²⁰ By ACS definition, the general population includes nondisabled, noninstitutionalized, civilian individuals ages 18 through 64. Census classifies respondents as “employed” if they are either “at work” or “with a job but not at work” during the reference week. Further clarification on employment and disability status can be found at https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf.

individuals in the general population. The variables E_{Gen} and N_{Gen} are calculated for each program and MSA using ACS data.

INDICATOR 2—PERCENTAGE OF HUD-ASSISTED HOUSEHOLDS WITH STABLE EMPLOYMENT FOR 3 YEARS

Indicator 2 is the percentage of work-able, HUD-assisted households who have stable employment for 3 years. It is calculated as follows:

$$Indicator\ 2 = \frac{NSE_{HUD}}{NT_{HUD}}$$

The variable NSE_{HUD} is the number of HUD-assisted households with at least one work-able member and earnings exceeding \$500 in each of 3 consecutive years,²¹ and NT_{HUD} is the number of HUD-assisted households that have received assistance throughout the 3-year period and have at least one work-able member in the household. For example, for a household to be part of NT_{HUD} in 2012, the household should receive HUD assistance from 2010 through 2012 and have at least one member who is work-able in 2012.

INDICATOR 3—RATIO BETWEEN HUD-ASSISTED AND OVERALL POPULATION FULL-TIME EMPLOYMENT RATES

Indicator 3 is the ratio between the full-time employment rates of the work-able, HUD-assisted, and overall populations. It is calculated as follows:

$$Indicator\ 3 = \frac{FTE_{HUD}/N_{HUD}}{FTE_{Gen}/N_{Gen}}$$

where FTE_{HUD} and FTE_{Gen} represent the number of work-able, full-time employed individuals for the HUD-assisted and overall populations, respectively. The study team used HUD longitudinal data files to estimate the total HUD-assisted population that is full-time employed (FTE_{HUD}). The team then calculated full-time employment for the general population (FTE_{Gen}) using ACS estimates of the work-able, full-time employed population. The total HUD-assisted population, N_{HUD} , and the total general population, N_{Gen} , are both estimated as in Indicator 1.

INDICATOR 4—PERCENTAGE OF HUD-ASSISTED INDIVIDUALS WHO ARE EITHER EMPLOYED OR IN SCHOOL

Indicator 4 is the percentage of work-able, HUD-assisted individuals who are either employed or full-time students. It is calculated as follows:

$$Indicator\ 4 = \frac{E_{HUD} \cup S_{HUD}}{N_{HUD}}$$

where the total employed (E_{HUD}) and the total populations (N_{HUD}) are calculated in Indicator 1. The numerator, $E_{HUD} \cup S_{HUD}$, is the number of individuals who are either employed, full-time students, or both. The study team estimated the total student population (S_{HUD}) using HUD’s longitudinal data file, which includes an indicator for whether a household member is a full-time student.²²

²¹ Because indicator 2 is a household-level indicator, the earnings may be contributed by different members each year, including by non “work-able” members.

²² The variable *mbr_rltm_cd* is equal to “E” (for IMS/PIC) or “D” (for TRACS) if the household member is a full-time student.

NATIONAL-LEVEL ESTIMATES

National estimates for each indicator are calculated as a weighted average of the indicator values (V) for each MSA weighted by the number of households (P) served by a given HUD program in that MSA.²³ The national indicators for each program are calculated using the formula that follows for 5 years, from 2012 through 2016, for each of the three programs and overall across the three programs, where n represents the number of MSAs.

$$Indicator = \frac{1}{\sum_1^n P_n} \sum_1^n V_n P_n$$

2.4 Limitations of the Indicators

The preceding section outlines how the study team calculated the indicators using HUD longitudinal data and ACS 5-year estimates. Exhibit 2-2 summarizes several limitations of those two data sources, which affect the estimation of each of the indicators. Exhibit 2-2 also describes how the information from HUD longitudinal data and ACS were not fully comparable.

Exhibit 2-2 | HUD Longitudinal Data and ACS Data Limitations

Exclusion Restriction or Indicator	Limitation
Nondisabled Population	Disability is determined by a single indicator in the HUD longitudinal data versus a six-item composite index in ACS. For HUD programs, disability status is determined by whether a person meets the Social Security Administration (SSA) definition of disabled (Dawkins and Miller, 2015). ²⁴ In contrast, the ACS definition of disability relies on self-reported assessments of difficulties from four functional limitation categories (hearing, vision, cognition, ambulation) and is not tied to the SSA definition (U.S. Census Bureau, 2017). ²⁵
Indicator 1: Ratio of Employment	In the absence of an employment status variable in HUD longitudinal data, the study team inferred employment status using an annual income threshold of \$500 or more per year. In contrast, ACS defines individuals as employed if they have done “any work at all . . . as paid employees” (U.S. Census Bureau, 2017).
Indicator 2: Percentage with Stable Employment for 3 Years	This indicator faces the same difficulties as Indicator 1: employment status of HUD-assisted households must be inferred from income sources and amounts. Similarly, stable household employment is defined as any household with wage income of at least \$500 per year for 3 years.

²³ Weights used to calculate national and quartile estimates are the same for all four indicators.

²⁴ In addition, HUD-assisted individuals may be classified as disabled if they have (1) physical, mental, or emotional impairment, which is expected to be of indefinite duration, substantially impedes his or her ability to live independently, and is of such a nature that such ability could be improved by more suitable housing conditions; (2) a developmental disability, as defined in Section 102 of the Developmental Disabilities Assistance and Bill of Rights Act; or (3) acquired immune deficiency syndrome (AIDS) or any condition that arises from the etiologic agent for AIDS. Although those conditions are initially self-reported, PHAs and project owners are supposed to verify (with a doctor or other professional) the disability status of HUD program participants (Dawkins and Miller, 2015).

²⁵ In recent years, HUD has collaborated with the Census Bureau to attach a HUDADMIN flag to ACS records to identify HUD-assisted households. Such data could be used to compare overall prevalence of disability among assisted households, as determined by administrative variables and by ACS variables. Privacy considerations may make household-level comparisons more difficult.

Exclusion Restriction or Indicator	Limitation
	<p>In addition, this indicator does not capture households with stable employment that may have been admitted recently or that exit the program before completing 3 years.</p>
<p>Indicator 3: Ratio of Full-Time Employment</p>	<p>In the absence of a full-time employment status variable in HUD longitudinal data, the study team inferred employment status using an income threshold of \$12,500 or more per year, in which this value is the lower bound of the annual earnings of an individual who worked 35 hours per week for 50 weeks per year at the federal minimum wage of \$7.25 per hour. This mirrors the ACS definition, in which individuals are classified as employed full-time, year-round if they worked a minimum of 1,750 hours (at least 35 hours per week on average for at least 50 weeks) in the past year (U.S. Census Bureau, 2017). In addition, one major caveat regarding the ACS definition of full-time employment is that the data do not contain income levels but rather counts of individuals meeting the requirements for hours and weeks worked.</p>
<p>Indicator 4: Percentage Working or in School</p>	<p>The variable in the HUD longitudinal data file that indicates full-time student status may lead to underestimates of the population of full-time students receiving HUD assistance. First, full-time student status is determined differently for participants in multifamily programs in the HUD-provided longitudinal data file.²⁶ Second, for individuals in public housing and HCV programs, full-time student status is not recorded if the member also has another position in the household.²⁷</p>
<p>Moving to Work (MTW)</p>	<p>The data required for each of the indicators are updated less frequently for participants in MTW than for other HUD assistance programs due to different reporting requirements. This may present a challenge because estimates may not reflect the entire HUD-assisted population. Such variation in reporting requirements may present special challenges in estimating Indicator 2 because this measure examines households that have 3 years of continuous HUD assistance. To the extent that MTW reporting occurs less often, this indicator may underestimate the number of MTW households with 3 years of continuous assistance. Of the approximately 3,825 housing agencies across the United States, however, only 39 of them were MTW PHAs in 2016. Our analysis of the MTW share of households in the MSAs with an MTW PHA did not show that reporting requirements were an issue, as the percentage of MTW households in the MSAs remained constant from 2012 through 2016. Although many MTW PHAs are in large MSAs, their lack of consistently reported data does not seem to materially affect estimates.²⁸</p>

²⁶ Form HUD-50059 collects data on dependent household members, including full-time students. To determine the number of full-time students in assisted multifamily programs, the study team used the code for dependent family members (HUD, 2014).

²⁷ Full-time student status is not recorded for household members who are also the head, spouse or cohead, foster child, or live-in aide (HUD PIH, 2004).

²⁸ Observations for MTW PHAs are included in all estimates. For transparency, MSAs served by MTW PHAs are bolded and italicized in each exhibit. See Appendix D for a list of MSAs and nonmetropolitan areas served by MTW PHAs.

3 RESULTS

In 2016, nearly 4.5 million households were enrolled in the three HUD housing assistance programs in the 50 states and the District of Columbia, with approximately 3.1 million work-able individuals residing in 2.3 million work-able households (see Exhibit 3-1, Panels A, B, and E). In addition, approximately 3.5 million households were receiving assistance for 3 years, including 1.6 million work-able households (Panels C and D). Exhibit 3-1 illustrates, from 2012 through 2016, the number of HUD-assisted households; HUD-assisted households with 3 years of assistance; HUD-assisted, work-able households and those receiving assistance for 3 years; and HUD-assisted, work-able individuals.

The number of HUD-assisted households increased slightly from 2012 to 2016 (Panel A), with growth in the HCV program offsetting decreases in public housing households. The overall number of work-able households and individuals across the three programs also had modest net decreases (Panels B and E), reflecting declines within the public housing and multifamily programs. In contrast, both household participation and the number of work-able households and individuals in the housing choice voucher (HCV) program increased from 2012 through 2016. The total number of households and work-able households with 3 years of HUD assistance increased from 2012 through 2016 across all three HUD programs.

The remainder of this chapter focuses on the estimates of each indicator. Although the patterns observed may be of interest to HUD stakeholders and may suggest potential causal factors, the purposes of this study did not include detailed comparisons or causal analysis.

Exhibit 3-1 | Total HUD-Assisted Households and Work-Able Individuals

Panel A: Total HUD-Assisted Households				
	Across All Three HUD Programs	Public Housing	HCV	Multifamily
2012	4,467,738	1,022,699	2,120,559	1,324,480
2013	4,425,166	1,014,143	2,084,735	1,326,288
2014	4,455,338	1,011,055	2,120,064	1,324,219
2015	4,494,405	989,785	2,182,709	1,321,911
2016	4,498,112	955,518	2,217,654	1,324,940
Panel B: Total HUD-Assisted, Work-Able Households				
	Across All Three HUD Programs	Public Housing	HCV	Multifamily
2012	2,328,502	561,330	1,266,131	501,041
2013	2,296,688	560,067	1,237,842	498,779
2014	2,300,748	556,099	1,248,947	495,702
2015	2,306,481	540,446	1,273,792	492,243
2016	2,291,047	519,762	1,281,750	489,535
Panel C: Total HUD-Assisted Households with 3 Years of Assistance				
	Across All Three HUD Programs	Public Housing	HCV	Multifamily
2012	3,281,498	708,684	1,630,430	942,384
2013	3,390,611	745,314	1,684,913	960,384
2014	3,468,610	756,263	1,737,277	975,070
2015	3,446,916	743,671	1,733,351	969,894
2016	3,459,670	726,696	1,760,343	972,631
Panel D: Total HUD-Assisted, Work-Able Households with 3 Years of Assistance				
	Across All Three HUD Programs	Public Housing	HCV	Multifamily
2012	1,525,265	347,078	894,334	283,853
2013	1,578,522	366,438	920,355	291,729
2014	1,620,531	372,303	947,552	300,676
2015	1,600,465	365,237	938,899	296,329
2016	1,592,099	355,214	941,801	295,084
Panel E: Total HUD-Assisted, Work-Able Individuals				
	Across All Three HUD Programs	Public Housing	HCV	Multifamily
2012	3,104,791	762,753	1,734,172	607,866
2013	3,072,398	761,650	1,705,926	604,822
2014	3,083,354	757,325	1,725,531	600,498
2015	3,081,682	733,018	1,753,156	595,508
2016	3,052,879	702,970	1,758,132	591,777

Notes: HUD-assisted households exclude (1) households that participated in programs other than public housing, HCV, and assisted multifamily; (2) households that ended participation in one of the HUD programs of interest during the calendar year; (3) households residing outside the 50 states and District of Columbia; and (4) households without geographic identifiers in the HUD longitudinal data file. Households are considered work-able if any member is nondisabled and ages 18 through 64. Individuals are considered work-able if they are nondisabled and ages 18 through 64. Total HUD-assisted households (Panel A) are the national totals of the variable used for weighting (total count of HUD-assisted households) to calculate the national and quartile estimates. Total HUD-assisted, work-able households with 3 years of assistance (Panel D) are the national totals of the variable used to calculate the denominator of Indicator 2. Total HUD-assisted, work-able individuals (Panel E) are the national totals of the variables used to calculate the HUD-assisted employment rate for Indicators 1, 3, and 4.

Sources: HUD Inventory Management System/Public and Indian Housing Information Center (IMS/PIC); Tenant Rental Assistance Certification System (TRACS) data from HUD longitudinal tenant data files

3.1 Indicator 1—Ratio of HUD-Assisted to Overall Population Employment Rates

Indicator 1 is the ratio of the employment rate for the work-able, HUD-assisted population to the employment rate for the work-able general population. This indicator represents the relationship between the employment rates for the two populations, for which a value greater than 1 means that the employment rate of the HUD-assisted population is greater than that of the overall population, and a value between 0 and 1 means that the employment rate for the HUD-assisted population is lower than that of the overall population.²⁹

NATIONAL ESTIMATES

The national-level estimates for Indicator 1 are presented in Exhibit 3-2. These estimates increase over time for all programs, with the ratio across all three HUD programs increasing by approximately 6 percentage points, from 0.535 in 2012 to 0.590 in 2016. Similarly, from 2012 through 2016, the estimate for public housing increased from 0.596 to 0.655, the estimate for HCV increased from 0.537 to 0.595, and the estimate for multifamily programs increased from 0.460 to 0.506. **All programs displayed gains. In addition, the estimates of Indicator 1 are higher for public housing and HCV compared with multifamily programs.**³⁰

Exhibit 3-2 | National-Level Estimates of Indicator 1: Ratio Between Work-Able, HUD-Assisted Individuals and Overall Population Employment Rates

	National-Level Estimates of Indicator 1			
	Across All Three HUD Programs	Public Housing	HCV	Multifamily
2012	0.535	0.596	0.537	0.460
2013	0.553	0.620	0.553	0.479
2014	0.572	0.641	0.571	0.495
2015	0.585	0.656	0.586	0.504
2016	0.590	0.655	0.595	0.506

Note: National-level mean estimates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state.

Sources: American Community Survey (ACS) 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-3 presents quartile means of the metropolitan statistical area (MSA) estimates of Indicator 1. These estimates provide insight similar to the trends illustrated in Exhibit 3-2. Across all programs and within each quartile, the estimates of Indicator 1 clearly increase from 2012 through 2016. Overall, these estimates suggest a partial convergence between the employment rates for HUD-assisted individuals and those for the overall population. Given that the national unemployment rate decreased from 8.3 percent to 4.9 percent from 2012 through 2016,³¹ these trends suggest that employment outcomes of HUD-assisted individuals are improving at a faster rate than those of the general

²⁹ Estimates of greater than 1 for Indicator 1 are not observed in the data.

³⁰ Although the reasons for differences across programs are worthy of investigation, such analysis is beyond the scope of this research.

³¹ Estimates for unemployment were obtained from the Bureau of Labor Statistics (2018).

population.³² In addition, comparing values for each program across quartiles suggests that assisted households in some MSAs are achieving markedly greater levels of success relative to their local labor markets.³³

Exhibit 3-3 | Quartile Means of MSA-Level Estimates of Indicator 1: Ratio Between Work-Able, HUD-Assisted Individuals and Overall Population Employment Rates

Quartiles of MSA-Level Estimates of Indicator 1				
Across All Three HUD Programs				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.456	0.517	0.564	0.627
2013	0.476	0.538	0.584	0.644
2014	0.493	0.556	0.602	0.658
2015	0.507	0.565	0.608	0.667
2016	0.508	0.564	0.609	0.668
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.464	0.571	0.645	0.741
2013	0.493	0.589	0.664	0.773
2014	0.515	0.619	0.685	0.795
2015	0.537	0.637	0.696	0.804
2016	0.537	0.636	0.693	0.795
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.457	0.524	0.578	0.663
2013	0.476	0.548	0.599	0.675
2014	0.492	0.561	0.615	0.695
2015	0.512	0.576	0.624	0.697
2016	0.518	0.579	0.629	0.694
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.343	0.414	0.484	0.570
2013	0.363	0.436	0.504	0.588
2014	0.377	0.452	0.520	0.607
2015	0.382	0.450	0.526	0.611
2016	0.375	0.455	0.527	0.608

³² Exhibits B-1 and B-2 in Appendix B present the mean MSA-level employment rates for each quartile of Indicator 1 for the HUD-assisted and overall populations, respectively. These estimates show that the employment rate for the HUD-assisted, work-able population increased for each program and quartile from 2012 through 2016, whereas the employment rate for the overall work-able population remained steady or increased slightly within each quartile over time.

³³ Differences between quartiles and between programs that appear in Exhibit 3-3 are not attributable entirely to changes in tenant outcomes because the mean denominator values presented in Exhibit B-2 reveal variations in MSA labor markets that necessarily affect these results. For example, differences in MSA denominator values account for almost 3 points of the 26-point difference between the first-quartile and fourth-quartile means shown for public housing in 2016.

Notes: Quartile mean estimates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state in that quartile.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

MSA AND NONMETROPOLITAN BALANCE OF STATE ESTIMATES

To probe into differences among MSAs, the top 10 and bottom 10 MSA-level estimates of Indicator 1 are presented in Exhibit 3-4. This exhibit illustrates a large degree of variation in estimates of Indicator 1 across MSAs. ***Estimates of Indicator 1 in 2016 range from 0.383 in Enid, OK, to 0.843 in Champaign-Urbana, IL.*** As seen in Exhibit 3-4, five MSAs (Lawrence, KS; Brownsville-Harlingen, TX; Hilton Head Island-Bluffton-Beaufort, SC; Flagstaff, AZ; and Santa Cruz-Watsonville, CA) consistently have among the highest estimates for Indicator 1 across the 5-year span, indicating that the employment rates for the HUD-assisted population in those areas are most similar to the employment rates for the overall population. Danville, IL; Tulsa, OK; Spokane-Spokane Valley, WA; and Johnstown, PA consistently have low estimates of Indicator 1, indicating that the employment rates for the HUD-assisted population in those areas is much lower than that for the overall population in each of those MSAs.

The estimates of Indicator 1 for the nonmetropolitan balance of each state presented in Exhibit 3-5³⁴ range from 0.435 in Maine to 0.753 in Louisiana. In addition, the Georgia, Kansas, Louisiana, Nebraska, and Texas nonmetropolitan balances of state had consistently high estimates for Indicator 1, and 7 of the 10 nonmetropolitan balances of state (Kentucky, Maine, Massachusetts, Nevada, Ohio, Virginia, and West Virginia) had consistently low estimates.

Such variations across the nation point to the potential value of such metrics for guiding further investigation of causal factors and for identifying opportunities for policy interventions. Areas with high indicator estimates might have useful lessons that could be shared to improve economic opportunity in areas with low indicator estimates. HUD also might be able to target monitoring resources or provide greater support for housing providers in areas with lower estimates.

³⁴ Only 47 states have nonmetropolitan balance areas, and three states (Delaware, New Jersey, and Rhode Island) plus Washington, D.C. are covered entirely by MSAs.

Exhibit 3-4 | MSAs with the Highest and Lowest Estimates Across All Three HUD Programs for Indicator 1: Ratio Between Work-Able, HUD-Assisted Individuals and Overall Population Employment Rates

MSAs with the Highest Ratio for Indicator 1										
2016		2015		2014		2013		2012		
1	<i>Champaign-Urbana, IL</i>	0.843	<i>Lawrence, KS</i>	0.856	<i>Lawrence, KS</i>	0.891	Manhattan, KS	0.833	Hilton Head Island-Bluffton-Beaufort, SC	0.823
2	<i>Lawrence, KS</i>	0.804	Manhattan, KS	0.836	Manhattan, KS	0.835	Hilton Head Island-Bluffton-Beaufort, SC	0.822	Flagstaff, AZ	0.781
3	Ithaca, NY	0.800	Hilton Head Island-Bluffton-Beaufort, SC	0.813	Hilton Head Island-Bluffton-Beaufort, SC	0.802	<i>Lawrence, KS</i>	0.817	Midland, TX	0.774
4	Brownsville-Harlingen, TX	0.795	Brownsville-Harlingen, TX	0.806	Brownsville-Harlingen, TX	0.800	State College, PA	0.794	<i>Lawrence, KS</i>	0.752
5	Hilton Head Island-Bluffton-Beaufort, SC	0.790	Santa Cruz-Watsonville, CA	0.785	Flagstaff, AZ	0.791	Bay City, MI	0.781	Manhattan, KS	0.745
6	Flagstaff, AZ	0.783	Houma-Thibodaux, LA	0.782	State College, PA	0.786	Flagstaff, AZ	0.776	Santa Cruz-Watsonville, CA	0.737
7	Santa Cruz-Watsonville, CA	0.777	Flagstaff, AZ	0.782	Midland, TX	0.782	Midland, TX	0.765	Brownsville-Harlingen, TX	0.717
8	State College, PA	0.770	Midland, TX	0.781	Houma-Thibodaux, LA	0.767	Brownsville-Harlingen, TX	0.761	<i>Visalia-Porterville, CA</i>	0.715
9	Florence, SC	0.765	Bay City, MI	0.771	Santa Cruz-Watsonville, CA	0.762	Charlottesville, VA	0.749	Houma-Thibodaux, LA	0.715
10	Laredo, TX	0.762	Crestview-Fort Walton Beach-Destin, FL	0.769	San Luis Obispo-Paso Robles-Arroyo Grande, CA	0.760	Santa Cruz-Watsonville, CA	0.738	State College, PA	0.708
MSAs with the Lowest Ratio for Indicator 1										
2016		2015		2014		2013		2012		
10	Sebring, FL	0.436	Danville, IL	0.445	Homosassa Springs, FL	0.439	Johnson City, TN	0.423	Huntington-Ashland, WV-KY-OH	0.407
9	Dalton, GA	0.428	Lake Havasu City-Kingman, AZ	0.443	<i>Portland-Vancouver-Hillsboro, OR-WA</i>	0.431	Spokane-Spokane Valley, WA	0.421	Johnstown, PA	0.406
8	Weirton-Steubenville, WV-OH	0.424	Blacksburg-Christiansburg-Radford, VA	0.435	Johnson City, TN	0.430	Lake Havasu City-Kingman, AZ	0.418	Bend-Redmond, OR	0.402
7	Johnstown, PA	0.420	Carson City, NV	0.424	Spokane-Spokane Valley, WA	0.422	<i>Portland-Vancouver-Hillsboro, OR-WA</i>	0.415	Longview, WA	0.402
6	Lake Havasu City-Kingman, AZ	0.416	Tulsa, OK	0.423	Longview, WA	0.421	Homosassa Springs, FL	0.411	Albany, OR	0.401
5	Spokane-Spokane Valley, WA	0.414	Johnstown, PA	0.420	Tulsa, OK	0.418	Kingsport-Bristol-Bristol, TN-VA	0.410	Spokane-Spokane Valley, WA	0.394
4	Blacksburg-Christiansburg-Radford, VA	0.407	Spokane-Spokane Valley, WA	0.419	Danville, IL	0.408	Tulsa, OK	0.404	Kingsport-Bristol-Bristol, TN-VA	0.392
3	Tulsa, OK	0.405	Dalton, GA	0.415	Dalton, GA	0.399	Johnstown, PA	0.401	Danville, IL	0.391
2	Danville, IL	0.397	Enid, OK	0.407	Johnstown, PA	0.397	Longview, WA	0.383	Tulsa, OK	0.391
1	Enid, OK	0.383	Homosassa Springs, FL	0.403	Enid, OK	0.379	Danville, IL	0.375	Enid, OK	0.378

Notes: The general population employment rate is calculated by dividing the employed, nondisabled population by the total nondisabled population. This ratio reflects nondisabled, noninstitutionalized civilian populations ages 18 through 64. The U.S. Census Bureau (Census; n.d.) classifies respondents as “employed” if they are either “at work” or “with a job but not at work” during the reference week. Further clarification on employment and disability status can be found at the following link:

["https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf"](https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf)

The employment rate for individuals participating in HUD programs is calculated by dividing the employed, work-able population by the overall work-able population across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages 18 through 64; individuals are considered employed if their wage income was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, Public Housing Authority (PHA) wages, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by Moving to Work (MTW) PHAs.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-5 | Estimates for Nonmetropolitan Balances of States of Indicator 1: Ratio Between Work-Able, HUD-Assisted Individuals and Overall Population Employment Rates

Indicator 1 for Nonmetropolitan Balances of State						
	State	2016	2015	2014	2013	2012
1	Louisiana	0.753	0.759	0.760	0.746	0.706
2	Texas	0.703	0.726	0.717	0.704	0.681
3	Georgia	0.697	0.683	0.669	0.645	0.621
4	Florida	0.689	0.672	0.657	0.624	0.596
5	Hawaii	0.672	0.674	0.655	0.626	0.610
6	Nebraska	0.663	0.683	0.709	0.686	0.669
7	Arizona	0.657	0.673	0.612	0.632	0.505
8	Alabama	0.650	0.650	0.629	0.611	0.587
9	Kansas	0.649	0.660	0.674	0.651	0.629
10	New Mexico	0.646	0.630	0.607	0.629	0.599
11	Maryland	0.641	0.634	0.648	0.641	0.572
12	South Carolina	0.632	0.639	0.620	0.597	0.557
13	Alaska	0.631	0.597	0.582	0.580	0.555
14	Michigan	0.627	0.622	0.632	0.613	0.609
15	South Dakota	0.618	0.624	0.608	0.643	0.585
16	Missouri	0.614	0.613	0.607	0.572	0.546
17	Illinois	0.612	0.629	0.631	0.625	0.606
18	Minnesota	0.611	0.619	0.623	0.616	0.586
19	Connecticut	0.609	0.578	0.635	0.570	0.609
20	Idaho	0.606	0.555	0.576	0.566	0.573
21	Arkansas	0.604	0.609	0.603	0.580	0.547
22	North Carolina	0.602	0.604	0.589	0.565	0.549
23	Wisconsin	0.597	0.604	0.602	0.585	0.566
24	Mississippi	0.596	0.593	0.566	0.560	0.548
25	Wyoming	0.596	0.646	0.636	0.639	0.612
26	North Dakota	0.586	0.632	0.601	0.644	0.652
27	New York	0.586	0.597	0.579	0.574	0.568
28	New Hampshire	0.583	0.599	0.585	0.564	0.556
29	California	0.582	0.563	0.568	0.556	0.511
30	Colorado	0.579	0.589	0.570	0.564	0.545
31	Oklahoma	0.576	0.587	0.604	0.599	0.587
32	Washington	0.569	0.569	0.564	0.541	0.528
33	Montana	0.559	0.570	0.569	0.584	0.554
34	Iowa	0.556	0.582	0.578	0.561	0.548
35	Tennessee	0.552	0.541	0.540	0.516	0.492
36	Vermont	0.551	0.527	0.499	0.484	0.454
37	Utah	0.548	0.567	0.563	0.611	0.620
38	Oregon	0.544	0.537	0.534	0.495	0.478
39	Massachusetts	0.527	0.498	0.461	0.477	0.458
40	Pennsylvania	0.526	0.520	0.526	0.539	0.516
41	Indiana	0.516	0.532	0.522	0.511	0.496
42	Virginia	0.506	0.513	0.505	0.476	0.466
43	Kentucky	0.501	0.509	0.513	0.503	0.489

Indicator 1 for Nonmetropolitan Balances of State						
	State	2016	2015	2014	2013	2012
44	West Virginia	0.471	0.494	0.482	0.479	0.464
45	Ohio	0.461	0.469	0.463	0.452	0.429
46	Nevada	0.443	0.447	0.449	0.495	0.476
47	Maine	0.435	0.441	0.432	0.410	0.390

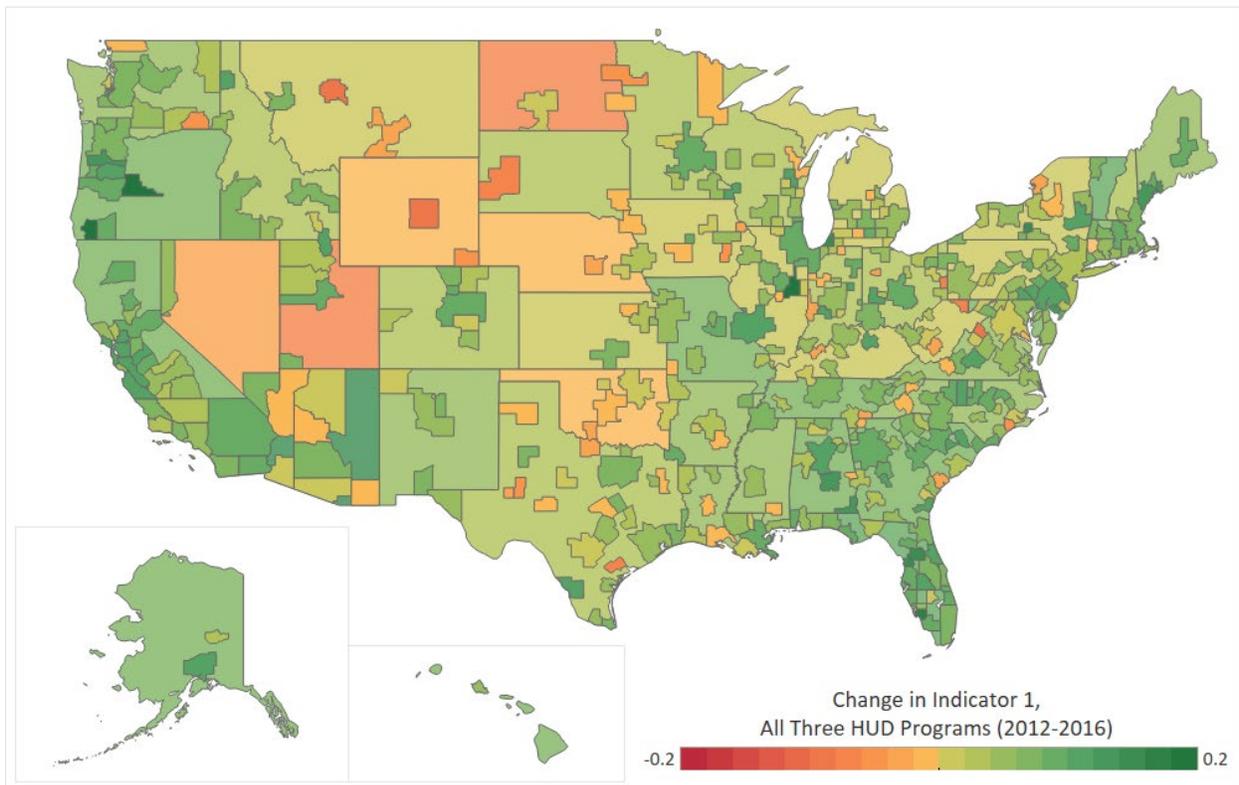
Notes: The general population employment rate is calculated by dividing the employed, nondisabled population by the total nondisabled population. This ratio reflects nondisabled, noninstitutionalized civilian populations ages 18 through 64. The Census Bureau classifies respondents as “employed” if they are either “at work” or “with a job but not at work” during the reference week. Further clarification on employment and disability status can be found at the following link: https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf.

The employment rate for individuals participating in HUD programs is calculated by dividing the employed, work-able population by the overall work-able population across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages 18 through 64; individuals are considered employed if their wage income was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, PHA wages, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-6 maps the change in estimates of Indicator 1 for all three HUD programs from 2012 through 2016. This map shows that the estimates of Indicator 1 increased for most MSAs (85 percent) and nonmetropolitan balance areas across the country (as illustrated by the shades of green). Estimates of Indicator 1 increased for most of the MSAs and nonmetropolitan balance areas, with 64 areas experiencing reductions in estimates of Indicator 1. The nonmetropolitan balance of Arizona (increase of 0.153) and the Champaign-Urbana, IL, MSA (increase of 0.282) experienced the largest increases in Indicator 1 from 2012 through 2016. In contrast, the nonmetropolitan balance of Utah (decrease of 0.071) and the Harrisonburg, VA, MSA (decrease of 0.099) experienced the largest declines in Indicator 1.

Exhibit 3-6 | Change in Indicator 1 Estimates Across All Three HUD Programs, From 2012 Through 2016: Ratio Between Work-Able, HUD-Assisted Individuals and Overall Population Employment Rates



Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

3.2 Indicator 2—Percentage of HUD-Assisted Households with Stable Employment for 3 Years

Indicator 2 is the share of work-able, HUD-assisted households with stable employment for 3 years.³⁵

NATIONAL ESTIMATES

The national-level estimates of Indicator 2 presented in Exhibit 3-7 show an increase over time for all programs, with the percentage of HUD-assisted households with stable employment across all three HUD programs increasing from 35.3 percent in 2012 to 39.4 percent in 2016. The stable employment rate for public housing and HCV increased by more than 4 percentage points, whereas the multifamily stable employment rate increased about 3 percentage points. Although the 3-year stable employment rate displayed gains across all programs, the 2012 estimates of Indicator 2 are greater than 12 percentage points higher for public housing and greater than 7 percentage points higher for HCV compared with multifamily programs. In 2016, 45.4 percent of households in public housing and 40.1 percent of households with HCVs had stable employment, compared with 31.1 percent of households in multifamily programs.

Exhibit 3-7 | National-Level Estimates of Indicator 2: Percentage of HUD-Assisted, Work-Able Households Having Stable Employment Over 3 Years

National-Level Estimates of Indicator 2				
	Across All Three HUD Programs (%)	Public Housing (%)	HCV (%)	Multifamily (%)
2012	35.3	41.1	35.5	28.2
2013	35.8	41.5	36.2	28.3
2014	36.8	42.6	37.2	29.2
2015	38.1	44.1	38.4	30.1
2016	39.4	45.4	40.1	31.1

Notes: National-level mean estimates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Quartile means of the MSA estimates of Indicator 2 presented in Exhibit 3-8 provide similar insight into the trends illustrated in Exhibit 3-7. Across all programs and within each quartile, the estimates of Indicator 2 display a clear increase from 2012 through 2016. Overall, these estimates show increases in the stable employment rate of households that participate in the HUD programs of interest.

³⁵ This indicator examines the population of work-able households that have received HUD assistance for each of the previous 3 years.

Exhibit 3-8 | Quartile Means of MSA-Level Estimates of Indicator 2: Percentage of HUD-Assisted, Work-Able Households Having Stable Employment Over 3 Years

Quartiles of MSA-Level Estimates of Indicator 2				
Across All Three HUD Programs				
	First Quartile (Lowest) (%)	Second Quartile (%)	Third Quartile (%)	Fourth Quartile (Highest) (%)
2012	25.0	30.2	34.4	45.7
2013	26.0	30.7	34.7	46.3
2014	26.8	31.6	36.1	47.1
2015	28.0	33.2	37.3	48.4
2016	28.7	34.2	38.5	49.8
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	26.0	34.8	42.5	53.2
2013	26.5	35.3	42.7	53.3
2014	27.5	36.8	44.4	54.3
2015	29.5	38.1	46.3	55.7
2016	30.4	39.1	46.9	57.1
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	26.1	30.8	35.3	45.5
2013	26.8	31.6	36.0	45.8
2014	28.1	32.7	37.2	46.1
2015	29.0	33.8	38.2	47.8
2016	29.8	34.7	39.7	49.6
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	15.3	20.9	27.1	40.2
2013	15.4	20.9	27.2	40.5
2014	16.2	21.3	28.3	41.8
2015	17.1	22.3	29.7	43.0
2016	18.0	23.5	30.3	44.1

Note: Quartile mean estimates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state in that quartile.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

MSA AND NONMETROPOLITAN BALANCE OF STATE ESTIMATES

The top 10 and bottom 10 MSA-level estimates of Indicator 2 presented in Exhibit 3-9 illustrate a large degree of variation in the indicator estimates across areas. ***Estimates for 2016 range from 16.6 percent in the Danville, IL, MSA to 65.4 percent in the Lawrence, KS, MSA.*** That is, 16.6 percent of work-able households in the Danville, IL MSA that received HUD assistance continuously from 2014 through 2016 had at least one member of the household who was employed in each of those 3 years, compared with 65.4 percent of work-able households in the Lawrence, KS MSA. Five of the MSAs³⁶ with the highest estimates consistently appear in the top 10 during each year shown, with stable employment rates of 57 percent or greater in 2016. Conversely, four MSAs³⁷ consistently appear in the bottom 10 in terms of stable household employment rates. These MSAs had stable household employment rates of less than 25 percent each year from 2012 through 2016.

The estimates of Indicator 2 for the nonmetropolitan balance of each state presented in Exhibit 3-10 illustrate stable household employment rates ranging from 26.6 percent in Maine to 53.9 percent in Hawaii, with seven of the top 10 and bottom 10 in 2016 consistently appearing in the top 10 and bottom 10, respectively, across the 5-year period.

³⁶ Urban Honolulu, HI; Lawrence, KS; Lincoln, NE; Santa Cruz-Watsonville, CA; and Santa Maria-Santa Barbara, CA consistently appear in the top 10 MSA estimates of Indicator 2.

³⁷ Blacksburg-Christiansburg-Radford, VA; Danville, IL; Enid, OK; and Tulsa, OK consistently appear in the bottom 10 MSA estimates of Indicator 2.

Exhibit 3-9 | MSAs with the Highest and Lowest Estimates Across All Three HUD Programs for Indicator 2: Percentage of HUD-Assisted, Work-Able Households Having Stable Employment Over 3 Years

MSAs with the Highest Share for Indicator 2										
	2016		2015		2014		2013		2012	
1	Lawrence, KS	65.4%	Lawrence, KS	68.1%	Lawrence, KS	64.1%	Lawrence, KS	57.5%	Urban Honolulu, HI	56.8%
2	Lincoln, NE	63.8%	Lincoln, NE	64.6%	Lincoln, NE	58.9%	Urban Honolulu, HI	56.9%	Santa Maria-Santa Barbara, CA	54.8%
3	Urban Honolulu, HI	59.3%	Santa Maria-Santa Barbara, CA	58.2%	Midland, TX	58.1%	Santa Maria-Santa Barbara, CA	56.0%	Santa Cruz-Watsonville, CA	53.0%
4	Santa Maria-Santa Barbara, CA	57.9%	Urban Honolulu, HI	58.0%	Santa Maria-Santa Barbara, CA	57.3%	Lincoln, NE	55.6%	New York-Newark-Jersey City, NY-NJ-PA	51.3%
5	Santa Cruz-Watsonville, CA	57.0%	Logan, UT-ID	57.9%	Visalia-Porterville, CA	57.2%	Midland, TX	55.6%	California-Lexington Park, MD	51.0%
6	Brownsville-Harlingen, TX	56.3%	Santa Cruz-Watsonville, CA	56.2%	Urban Honolulu, HI	57.1%	Santa Cruz-Watsonville, CA	53.3%	Midland, TX	50.9%
7	Bay City, MI	56.2%	Midland, TX	55.2%	Logan, UT-ID	55.6%	Visalia-Porterville, CA	53.2%	Lincoln, NE	50.7%
8	Oxnard-Thousand Oaks-Ventura, CA	55.7%	Salinas, CA	55.1%	Santa Cruz-Watsonville, CA	55.3%	Oxnard-Thousand Oaks-Ventura, CA	51.9%	Lawrence, KS	50.4%
9	Manhattan, KS	55.4%	Manhattan, KS	54.3%	State College, PA	54.5%	New York-Newark-Jersey City, NY-NJ-PA	51.1%	Flagstaff, AZ	50.3%
10	Salinas, CA	55.2%	Bay City, MI	54.1%	Napa, CA	52.9%	La Crosse-Onalaska, WI-MN	50.5%	Visalia-Porterville, CA	50.1%
MSAs with the Lowest Share for Indicator 2										
	2016		2015		2014		2013		2012	
10	Dalton, GA	24.2%	Kingsport-Bristol-Bristol, TN-VA	23.1%	Longview, WA	21.6%	Anniston-Oxford-Jacksonville, AL	22.2%	Jefferson City, MO	22.0%
9	Sebring, FL	23.7%	Johnstown, PA	22.8%	Tulsa, OK	21.6%	Sebring, FL	22.1%	Toledo, OH	21.7%
8	Lake Havasu City-Kingman, AZ	23.1%	Lake Havasu City-Kingman, AZ	22.6%	Johnstown, PA	21.4%	Enid, OK	21.7%	Kingsport-Bristol-Bristol, TN-VA	21.1%
7	Tulsa, OK	22.2%	Carson City, NV	22.3%	Muskegon, MI	20.8%	Tulsa, OK	21.2%	Danville, IL	20.3%
6	Johnstown, PA	20.5%	Tulsa, OK	21.9%	Dalton, GA	19.8%	Carson City, NV	21.1%	Tulsa, OK	20.2%
5	Prescott, AZ	20.5%	Prescott, AZ	21.4%	Prescott, AZ	19.6%	Longview, WA	20.7%	Muskegon, MI	20.2%
4	Cleveland, TN	20.3%	Enid, OK	21.2%	Blacksburg-Christiansburg-Radford, VA	18.8%	Dalton, GA	19.4%	Cleveland, TN	19.8%
3	Blacksburg-Christiansburg-Radford, VA	19.8%	Cleveland, TN	21.2%	Carson City, NV	17.3%	Muskegon, MI	19.2%	Longview, WA	19.1%
2	Enid, OK	19.1%	Blacksburg-Christiansburg-Radford, VA	20.5%	Danville, IL	16.8%	Blacksburg-Christiansburg-Radford, VA	17.8%	Enid, OK	18.4%
1	Danville, IL	16.6%	Danville, IL	18.7%	Enid, OK	15.5%	Danville, IL	15.4%	Blacksburg-Christiansburg-Radford, VA	16.9%

Notes: The employment rate for HUD program households is calculated by dividing the employed, work-able households by the overall work-able households across all three HUD programs and within each program. Households are considered work-able if any member is nondisabled and ages 18 through 64; households are considered employed if the total wage income in the work-able household was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Household total wage income is derived from business income, federal wages, PHA wages, military pay, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-10 | Estimates for Nonmetropolitan Balances of States of Indicator 2: Percentage of HUD-Assisted, Work-Able Households Having Stable Employment Over 3 Years

Indicator 2 for Nonmetropolitan Balances of States						
	State	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
1	Hawaii	53.9	50.5	49.6	46.9	44.9
2	Nebraska	52.6	52.9	51.9	50.4	47.4
3	Kansas	47.3	46.9	46.4	45.5	45.4
4	<i>New Hampshire</i>	46.4	46.4	44.9	42.5	40.7
5	Connecticut	45.2	39.2	42.2	42.2	38.0
6	Minnesota	44.8	44.8	42.7	40.7	40.7
7	Texas	44.6	44.6	43.6	43.4	42.8
8	Wyoming	44.6	43.4	38.8	39.8	38.7
9	Louisiana	43.7	45.4	43.4	42.0	40.6
10	<i>Alaska</i>	43.3	39.7	34.4	35.2	35.0
11	South Dakota	42.5	43.0	41.2	41.1	38.4
12	Maryland	42.0	43.3	41.8	40.0	39.8
13	North Dakota	41.9	44.5	46.1	43.9	44.8
14	Wisconsin	41.6	40.4	39.5	36.4	37.4
15	Florida	41.5	39.9	37.9	35.9	35.8
16	Illinois	40.1	38.9	38.5	38.5	38.2
17	New York	39.9	38.4	38.6	39.5	39.6
18	Iowa	39.4	37.6	37.6	36.6	35.1
19	Arizona	39.4	39.0	34.6	30.2	28.5
20	Georgia	38.4	36.7	35.9	34.8	34.0
21	Missouri	38.4	38.6	36.9	36.0	33.6
22	Michigan	38.3	37.3	37.1	36.2	35.4
23	Colorado	38.1	38.6	37.2	36.2	37.0
24	<i>Massachusetts</i>	38.0	36.3	32.7	31.4	31.4
25	New Mexico	37.1	36.5	35.4	35.1	34.3
26	Washington	35.9	33.7	32.9	32.3	32.2
27	Vermont	35.7	35.1	32.2	32.1	31.2
28	California	35.7	35.0	32.5	31.0	33.0
29	Alabama	35.5	34.6	34.0	33.4	33.0
30	Arkansas	35.4	34.0	32.6	32.1	30.7
31	Idaho	35.1	34.4	37.1	32.6	32.8
32	Utah	34.1	40.8	38.0	32.1	31.4
33	Montana	34.0	35.2	32.8	34.2	32.8
34	Oklahoma	33.5	35.4	35.1	36.3	34.5
35	Pennsylvania	33.3	32.9	33.9	34.7	33.5
36	Oregon	32.9	30.8	29.9	28.9	28.3
37	North Carolina	32.2	31.4	30.8	29.3	29.9
38	Mississippi	31.8	30.4	30.2	30.8	31.0
39	Indiana	31.7	31.1	29.7	28.7	27.6
40	South Carolina	31.6	30.8	29.4	29.0	27.8
41	Tennessee	31.6	30.8	30.2	27.6	25.6
42	Kentucky	29.7	29.4	28.3	27.9	28.3
43	Virginia	29.6	29.4	28.7	27.6	27.0

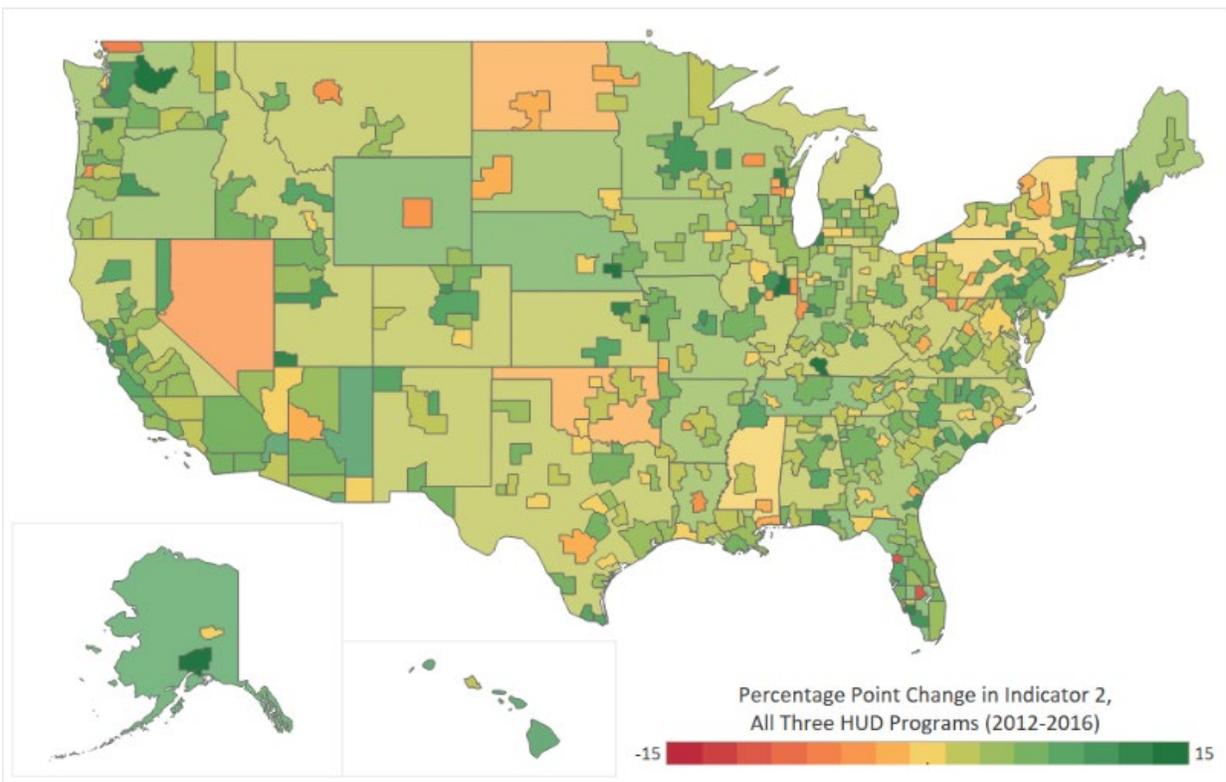
Indicator 2 for Nonmetropolitan Balances of States						
	State	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
44	Nevada	29.5	29.4	29.7	30.6	33.3
45	Ohio	27.8	27.2	26.6	25.8	24.9
46	West Virginia	27.6	27.0	26.2	26.0	26.6
47	Maine	26.6	26.2	24.1	23.4	22.1

Notes: The employment rate for HUD program households is calculated by dividing the employed, work-able households by the overall work-able households across all three HUD programs and within each program. Households are considered work-able if any member is nondisabled and ages 18 through 64; households are considered employed if the total wage income in the work-able household was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Household total wage income is derived from business income, federal wages, PHA wages, military pay, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-11 maps the percentage point change in estimates of Indicator 2 for all three HUD programs from 2012 through 2016. This map shows that estimates of the stable employment rates of HUD-assisted households increased for many MSAs (89 percent) and nonmetropolitan balance areas (as illustrated by the shades of green). The nonmetropolitan balance of Arizona (increase of 10.9 percentage points) and Champaign-Urbana, IL (increase of 25.5 percentage points) experienced the largest increases in Indicator 2 from 2012 through 2016. In contrast, the nonmetropolitan balance of Nevada (decrease of 3.9 percentage points) and Homosassa Springs, FL (decrease of 10.5 percentage points) experienced the largest declines in estimates of Indicator 2.

Exhibit 3-11 | Change in Indicator 2 Estimate Across All Three HUD Programs, From 2012 Through 2016: Percentage of HUD-Assisted, Work-Able Households Having Stable Employment Over 3 Years



Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

3.3 Indicator 3—Ratio Between HUD-Assisted and Overall Population Full-Time Employment Rates

Indicator 3 is the ratio of the full-time employment rate for the work-able, HUD-assisted population to the full-time employment rate for the work-able general population. This indicator represents the relationship between the full-time employment rates for the two populations, in which a value greater than 1 means that the full-time employment rate for the HUD-assisted population is greater than that of the overall population, and a value between 0 and 1 means that the employment rate for the HUD-assisted population is lower than that of the overall population.³⁸

NATIONAL ESTIMATES

The national-level estimates for Indicator 3 presented in Exhibit 3-12 show relatively large increases over time for all programs, with the ratio across all three HUD programs increasing from 0.415 in 2012 to 0.513 in 2016. Although all programs displayed gains, the estimates of Indicator 3 are higher for public housing and HCV compared with multifamily programs. From 2012 through 2016, the estimate for public housing increased from 0.491 to 0.584, the estimate for HCV increased from 0.415 to 0.517, and the estimate for multifamily programs increased from 0.327 to 0.424. ***These national-level estimates show that the full-time employment rate for the HUD-assisted population was about one-half that of the rate for the overall population in 2016***, bearing in mind the differences in how full-time employment is determined.

Exhibit 3-12 | National-Level Estimates of Indicator 3: Ratio Between HUD-Assisted and Overall Population Rates of Full-Time Employment

National-Level Estimates of Indicator 3				
	Across All Three HUD Programs	Public Housing	HCV	Multifamily
2012	0.415	0.491	0.415	0.327
2013	0.437	0.515	0.436	0.349
2014	0.461	0.539	0.460	0.373
2015	0.491	0.569	0.491	0.403
2016	0.513	0.584	0.517	0.424

Notes: National-level mean estimates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Quartile means of the MSA estimates of Indicator 3 presented in Exhibit 3-13 provide additional, but similar, insights into the trends illustrated in Exhibit 3-12. Across all programs and within each quartile, the estimates of Indicator 3 clearly increase from 2012 through 2016. Although the full-time employment rate for the HUD-assisted population is lower than that of the overall population, these trends suggest a slight convergence in these rates over time. Given that the full-time employment rate in the overall population remained fairly consistent, from 51.9 percent in 2012 to 53.8 percent in 2016,

³⁸ Estimates greater than 1 for Indicator 3 are rarely observed in the data; see Exhibit 3-14 for additional details.

these positive trends suggest that full-time employment rates are improving faster for HUD-assisted individuals than for the general population.³⁹

Exhibit 3-13 | Quartile Means of MSA-Level Estimates of Indicator 3: Ratio Between HUD-Assisted and Overall Population Rates of Full-Time Employment

Quartiles of MSA-Level Estimates of Indicator 3 Across All Three HUD Programs				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.303	0.364	0.415	0.525
2013	0.320	0.386	0.441	0.550
2014	0.342	0.412	0.465	0.577
2015	0.366	0.441	0.493	0.607
2016	0.378	0.452	0.511	0.629
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.318	0.421	0.511	0.635
2013	0.343	0.448	0.537	0.652
2014	0.367	0.474	0.563	0.678
2015	0.385	0.504	0.603	0.704
2016	0.398	0.524	0.620	0.718
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.305	0.373	0.425	0.511
2013	0.331	0.397	0.451	0.535
2014	0.348	0.416	0.485	0.588
2015	0.370	0.445	0.501	0.589
2016	0.382	0.469	0.528	0.621
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.177	0.238	0.309	0.448
2013	0.191	0.263	0.333	0.472
2014	0.212	0.285	0.374	0.512
2015	0.235	0.316	0.401	0.532
2016	0.246	0.332	0.431	0.565

Notes: Quartile mean estimates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state in that quartile.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

³⁹ Exhibits B-3 and B-4 in Appendix B present the mean MSA-level, full-time employment rates for each quartile of Indicator 3 for the HUD-assisted and overall populations, respectively. These estimates show that the full-time employment rate for the HUD-assisted, work-able population increased for each program and quartile between 2012 and 2016, whereas the full-time employment rate for the overall, work-able population remained steady or increased slightly within each quartile over time.

MSA AND NONMETROPOLITAN BALANCE OF STATE ESTIMATES

The top 10 and bottom 10 MSA-level estimates of Indicator 3 presented in Exhibit 3-14 illustrate a very large degree of variation in the estimates across MSAs. ***Estimates for 2016 range from 0.249 in the Enid, OK MSA to 0.959 in the Lawrence, KS MSA.***⁴⁰ Six MSAs (Flagstaff, AZ; Lawrence, KS; San Luis Obispo-Paso Robles-Arroyo Grande, CA; Santa Cruz-Watsonville, CA; Santa Maria-Santa Barbara, CA; and Visalia-Porterville, CA) consistently have among the highest estimates for Indicator 3, suggesting that the full-time employment rates for the HUD-assisted populations in those areas are most similar to the full-time employment rates of the overall population. Those MSAs have estimates of Indicator 3 that are approximately 0.8 or higher from 2012 through 2016. Conversely, two MSAs (Johnstown, PA and Kingsport-Bristol-Bristol, TN-VA) consistently have among the lowest estimates for Indicator 3, below 0.26 each year from 2012 through 2016.

The estimates of Indicator 3 for the nonmetropolitan balance of each state presented in Exhibit 3-15 range from 0.311 in West Virginia to 0.746 in Alaska. The top six nonmetropolitan balances of states (Alaska, Connecticut, Hawaii, Maryland, Nebraska, and New Hampshire) are consistently in the top five across the 5 years, and 6 of the 10 balances of states (Indiana, Kentucky, Maine, Ohio, Virginia, and West Virginia) consistently have low estimates.

⁴⁰ For 2014 and 2015, the value of Indicator 3 was greater than 1 in the Lawrence, KS MSA, meaning that the HUD-assisted population had a full-time employment rate that was greater than that of the overall population.

Exhibit 3-14 | MSAs with the Highest and Lowest Estimates Across All Three HUD Programs for Indicator 3: Ratio Between HUD-Assisted and Overall Population Rates of Full-Time Employment

MSAs with the Highest Ratio for Indicator 3										
2016		2015		2014		2013		2012		
1	Lawrence, KS	0.959	Lawrence, KS	1.040	Lawrence, KS	1.050	Lawrence, KS	0.945	Lawrence, KS	0.834
2	Santa Cruz-Watsonville, CA	0.909	Santa Cruz-Watsonville, CA	0.908	Flagstaff, AZ	0.868	Flagstaff, AZ	0.838	Flagstaff, AZ	0.822
3	Visalia-Porterville, CA	0.867	Manhattan, KS	0.897	Santa Cruz-Watsonville, CA	0.854	Santa Cruz-Watsonville, CA	0.814	Santa Cruz-Watsonville, CA	0.781
4	Flagstaff, AZ	0.864	Flagstaff, AZ	0.853	Santa Maria-Santa Barbara, CA	0.814	Santa Maria-Santa Barbara, CA	0.774	Santa Maria-Santa Barbara, CA	0.735
5	Salinas, CA	0.843	Santa Maria-Santa Barbara, CA	0.832	San Luis Obispo-Paso Robles-Arroyo Grande, CA	0.774	Midland, TX	0.734	Visalia-Porterville, CA	0.721
6	Ithaca, NY	0.837	Visalia-Porterville, CA	0.820	Ames, IA	0.770	Visalia-Porterville, CA	0.730	San Luis Obispo-Paso Robles-Arroyo Grande, CA	0.712
7	San Luis Obispo-Paso Robles-Arroyo Grande, CA	0.816	Salinas, CA	0.817	Midland, TX	0.768	San Luis Obispo-Paso Robles-Arroyo Grande, CA	0.714	Midland, TX	0.705
8	Santa Maria-Santa Barbara, CA	0.810	San Luis Obispo-Paso Robles-Arroyo Grande, CA	0.776	Mount Vernon-Anacortes, WA	0.768	Ithaca, NY	0.713	Ithaca, NY	0.676
9	Champaign-Urbana, IL	0.793	Midland, TX	0.756	Visalia-Porterville, CA	0.762	Salinas, CA	0.698	Manhattan, KS	0.654
10	Corvallis, OR	0.761	Logan, UT-ID	0.753	Salinas, CA	0.748	Manhattan, KS	0.685	Hilton Head Island-Bluffton-Beaufort, SC	0.638
MSAs with the Lowest Ratio for Indicator 3										
2016		2015		2014		2013		2012		
10	Lawton, OK	0.306	Tulsa, OK	0.293	Johnson City, TN	0.268	Weirton-Stuebenville, WV-OH	0.267	Lynchburg, VA	0.238
9	Goldsboro, NC	0.304	Johnson City, TN	0.292	Hickory-Lenoir-Morganton, NC	0.265	Dalton, GA	0.260	Hanford-Corcoran, CA	0.234
8	Johnson City, TN	0.295	Huntington-Ashland, WV-KY-OH	0.291	Huntington-Ashland, WV-KY-OH	0.258	Sebring, FL	0.257	Huntington-Ashland, WV-KY-OH	0.233
7	Sheboygan, WI	0.288	Hot Springs, AR	0.289	Danville, IL	0.253	Danville, IL	0.243	Enid, OK	0.230
6	Pocatello, ID	0.279	Hickory-Lenoir-Morganton, NC	0.286	Dalton, GA	0.238	Prescott, AZ	0.242	Dalton, GA	0.228
5	Tulsa, OK	0.272	Danville, IL	0.274	Morristown, TN	0.237	Hickory-Lenoir-Morganton, NC	0.239	Sheboygan, WI	0.225
4	Kingsport-Bristol-Bristol, TN-VA	0.257	Morristown, TN	0.256	Kingsport-Bristol-Bristol, TN-VA	0.232	Huntington-Ashland, WV-KY-OH	0.218	Jefferson City, MO	0.209
3	Danville, IL	0.249	Enid, OK	0.255	Prescott, AZ	0.209	Kingsport-Bristol-Bristol, TN-VA	0.209	Kingsport-Bristol-Bristol, TN-VA	0.206
2	Johnstown, PA	0.249	Kingsport-Bristol-Bristol, TN-VA	0.242	Johnstown, PA	0.174	Johnstown, PA	0.198	Johnstown, PA	0.191
1	Enid, OK	0.249	Johnstown, PA	0.223	Homosassa Springs, FL	0.156	Homosassa Springs, FL	0.123	Prescott, AZ	0.136

Notes: The general population full-time employment rate is calculated by dividing the full-time, year-round-employed, nondisabled population by the total nondisabled population. This ratio reflects nondisabled, noninstitutionalized civilian populations ages 18 through 64. Census classifies respondents as “Employed” if they are either at work or with a job but not at work during the reference week. “Full-time, year-round” is defined as persons who usually worked 35 hours or more per week for 50 to 52 weeks in the past 12 months. Further clarification on employment and disability status can be found at the following link: https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf.

The employment rate for individuals participating in HUD programs is calculated by dividing the population with full-time employment status by the overall work-able population across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages 18 through 64; individuals are considered full time if their wage income was at least \$12,500 in the given year (\$12,500 represents the wage income of just under 35 hours of work for at least 50 weeks per year at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, PHA wages, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-15 | Estimates for Nonmetropolitan Balances of States of Indicator 3: Ratio Between HUD-Assisted and Overall Population Rates of Full-Time Employment

Indicator 3 for Nonmetropolitan Balances of States						
	State	2016	2015	2014	2013	2012
1	Alaska	0.746	0.682	0.632	0.689	0.689
2	Hawaii	0.630	0.614	0.556	0.529	0.492
3	Maryland	0.615	0.588	0.572	0.545	0.461
4	Florida	0.581	0.535	0.501	0.456	0.424
5	New Hampshire	0.578	0.580	0.525	0.505	0.457
6	Connecticut	0.569	0.558	0.553	0.509	0.564
7	Washington	0.545	0.505	0.488	0.453	0.415
8	Nebraska	0.544	0.547	0.541	0.480	0.482
9	Minnesota	0.540	0.523	0.480	0.456	0.403
10	Massachusetts	0.531	0.478	0.419	0.400	0.391
11	Louisiana	0.515	0.523	0.528	0.518	0.487
12	Vermont	0.514	0.491	0.460	0.432	0.385
13	California	0.509	0.483	0.464	0.434	0.380
14	Arizona	0.506	0.473	0.408	0.410	0.274
15	Colorado	0.503	0.511	0.454	0.431	0.401
16	Alabama	0.499	0.490	0.456	0.449	0.417
17	Oregon	0.494	0.477	0.430	0.386	0.341
18	New York	0.490	0.485	0.450	0.418	0.412
19	South Dakota	0.487	0.499	0.443	0.447	0.384
20	Texas	0.485	0.507	0.506	0.476	0.444
21	Kansas	0.481	0.507	0.495	0.445	0.408
22	Georgia	0.475	0.446	0.408	0.383	0.366
23	North Dakota	0.473	0.510	0.482	0.504	0.467
24	Michigan	0.460	0.446	0.403	0.359	0.337
25	Montana	0.453	0.468	0.434	0.441	0.417
26	South Carolina	0.453	0.439	0.397	0.373	0.331
27	Wisconsin	0.447	0.439	0.422	0.399	0.372
28	Illinois	0.446	0.456	0.454	0.450	0.424
29	Wyoming	0.441	0.530	0.514	0.485	0.448
30	New Mexico	0.438	0.454	0.414	0.424	0.387
31	Arkansas	0.415	0.401	0.389	0.367	0.339
32	Missouri	0.414	0.419	0.408	0.370	0.345
33	Mississippi	0.407	0.412	0.367	0.357	0.346
34	Iowa	0.405	0.406	0.368	0.361	0.341
35	Idaho	0.405	0.373	0.312	0.307	0.312
36	North Carolina	0.401	0.400	0.379	0.349	0.335
37	Tennessee	0.401	0.377	0.363	0.341	0.303
38	Oklahoma	0.398	0.428	0.439	0.421	0.393
39	Nevada	0.390	0.345	0.387	0.412	0.410
40	Pennsylvania	0.369	0.358	0.344	0.348	0.332
41	Maine	0.364	0.321	0.313	0.297	0.275
42	Indiana	0.342	0.334	0.325	0.302	0.275
43	Kentucky	0.332	0.339	0.326	0.311	0.302

Indicator 3 for Nonmetropolitan Balances of States						
	State	2016	2015	2014	2013	2012
44	Ohio	0.330	0.328	0.300	0.282	0.256
45	Utah	0.323	0.303	0.372	0.340	0.347
46	Virginia	0.320	0.320	0.294	0.267	0.262
47	West Virginia	0.311	0.303	0.271	0.261	0.264

Notes: The general population full-time employment rate is calculated by dividing the full-time, year-round-employed, nondisabled population by the total nondisabled population. This ratio reflects nondisabled, noninstitutionalized civilian populations ages 18 through 64. The Census Bureau classifies respondents as “Employed” if they are either at work or with a job but not at work during the reference week. “Full-time, year-round” is defined as persons who usually worked 35 hours or more per week for 50 to 52 weeks in the past 12 months. Further clarification on employment and disability status can be found at the following link:

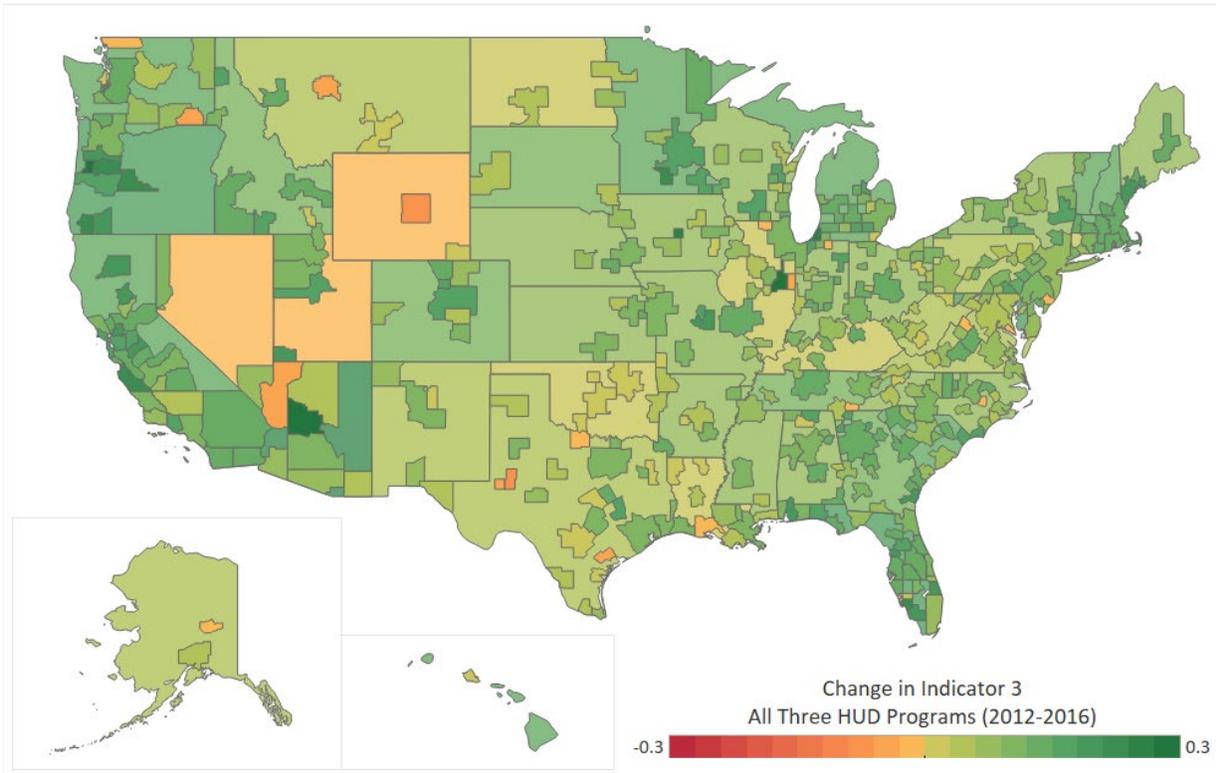
https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf.

The employment rate for individuals participating in HUD programs is calculated by dividing the population with full-time employment status by the overall work-able population across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages 18 through 64; individuals are considered full-time if their wage income was at least \$12,500 in the given year (\$12,500 represents the wage income of just under 35 hours of work for at least 50 weeks per year at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, PHA wages, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-16 presents a visual mapping of the change in estimates of Indicator 3 for all three HUD programs from 2012 through 2016. This map shows that estimates of Indicator 3 increased for nearly all (409 out of 430) MSAs and nonmetropolitan balance areas (as illustrated by the shades of green). The nonmetropolitan balance of Arizona and the Champaign-Urbana, IL MSA experienced the largest increases in Indicator 3 (0.232 and 0.296, respectively). By contrast, the nonmetropolitan balances of Utah (decrease of 0.024) and the Casper, WY MSA (decrease of 0.077) experienced the largest decline in the estimates of Indicator 3.

Exhibit 3-16 | Change in Indicator 3 Estimate Across All Three HUD Programs, From 2012 Through 2016: Ratio Between HUD-Assisted and Overall Population Rates of Full-Time Employment



Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

3.4 Indicator 4—Percentage of HUD-Assisted Individuals Who Are Either Employed or in School

Indicator 4 is the percentage of work-able, HUD-assisted individuals who are either employed or are full-time students.

NATIONAL ESTIMATES

The national-level estimates of Indicator 4 presented in Exhibit 3-17 show an increase over time for all programs, with the rate across all three HUD programs increasing from 44.9 percent in 2012 to 49 percent in 2016. From 2012 through 2016, the estimates of Indicator 4 for public housing, HCV, and multifamily programs each increased by approximately 4 percentage points. **National estimates of Indicator 4 illustrate that nearly 50 percent of the HUD-assisted work-able population was either employed or a full-time student in 2016.** Estimates of Indicator 4 are higher for public housing and HCV, compared with the multifamily program. In 2016, 53.5 percent of work-able individuals in public housing, 49.8 percent of work-able individuals in HCV, and 41.8 percent of work-able individuals in multifamily programs were either employed or full-time students.

Exhibit 3-17 | National-Level Estimates of Indicator 4: Percentage of HUD-Assisted, Work-Able Individuals Either Employed or in School

	National -Level Estimates of Indicator 4			
	Across All Three HUD Programs (%)	Public Housing (%)	HCV (%)	Multifamily (%)
2012	44.9	49.2	45.7	38.0
2013	45.8	50.4	46.4	39.0
2014	47.1	51.9	47.6	40.3
2015	48.3	53.3	48.9	41.3
2016	49.0	53.5	49.8	41.8

Notes: National-level mean estimates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Quartile means of the MSA estimates of Indicator 4 presented in Exhibit 3-18 provide additional, but similar, insight into the trends illustrated in Exhibit 3-17. Across all programs and within each quartile, the estimates of Indicator 4 clearly increase from 2012 through 2016. Overall, these estimates of Indicator 4 suggest increases in the share of HUD-assisted individuals that are either employed or in school full time.

Exhibit 3-18 | Quartiles Means of MSA-Level Estimates of Indicator 4: Percentage of HUD-Assisted, Work-Able Individuals Either Employed or in School

Quartiles of MSA-Level Estimates of Indicator 4				
Across All Three HUD Programs				
	First Quartile (Lowest) (%)	Second Quartile (%)	Third Quartile (%)	Fourth Quartile (Highest) (%)
2012	37.3	41.9	45.9	52.3
2013	38.3	43.0	46.7	53.1
2014	39.2	44.4	48.1	54.3
2015	40.3	45.4	49.5	55.2
2016	40.8	46.1	50.1	55.3
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	38.1	46.3	52.9	59.6
2013	39.8	47.8	53.5	61.1
2014	41.1	49.5	54.7	62.4
2015	42.9	51.1	56.0	64.3
2016	44.2	51.5	55.8	63.8
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	38.3	44.0	47.5	52.9
2013	39.2	44.5	47.9	53.6
2014	40.2	45.7	49.5	54.6
2015	41.0	46.3	50.6	55.4
2016	41.7	47.4	51.7	56.0
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	26.4%	32.2%	38.4%	47.5%
2013	28.0%	33.8%	39.9%	48.8%
2014	28.7%	34.8%	40.9%	50.2%
2015	29.3%	35.5%	41.9%	51.6%
2016	28.9%	35.9%	42.4%	52.2%

Notes: Quartile mean estimates are weighted by the number of households served by the HUD program in each MSA or non-metropolitan balance of state in that quartile.

Sources: HUD IMS/PIC and TRACS data from the HUD longitudinal tenant data files

MSA AND NONMETROPOLITAN BALANCE OF STATE ESTIMATES

The top 10 and bottom 10 MSA-level estimates of Indicator 4 are presented in Exhibit 3-19. ***Estimates for 2016 range from 29.9 percent in the Enid, OK, MSA to 63.7 percent in the Lawrence, KS, MSA***—that is, 29.9 percent of HUD-assisted individuals in the Enid, OK, MSA were either employed or full-time students, compared with 63.7 percent of individuals in the Lawrence, KS, MSA. Four MSAs (Hilton Head Island-Bluffton-Beaufort, SC; Lawrence, KS; Lincoln, NE; and Santa Cruz-Watsonville, CA) consistently have among the highest estimates for Indicator 4, with rates of employed individuals and full-time students of nearly 60 percent or more in 2016. Conversely, two MSAs (Blacksburg-Christiansburg-Radford, VA and Danville, IL) have consistently low estimates of Indicator 4 (below 34 percent).

The estimates of Indicator 4 for the nonmetropolitan balance of each state presented in Exhibit 3-20 illustrate rates of employed individuals and full-time students ranging from 33.5 percent in Nevada to 57.5 percent in Nebraska, with the top 6 in 2016 consistently appearing in the top 10 and 8 of the bottom 10 consistently appearing in the bottom 10 across the 5-year period.

Exhibit 3-19 | MSAs with the Highest and Lowest Estimates Across All Three HUD Programs for Indicator 4: Percentage of HUD-Assisted, Work-Able Individuals Either Employed or in School

MSAs with the Highest Share for Indicator 4										
	2016		2015		2014		2013		2012	
1	Lawrence, KS	63.7%	Lawrence, KS	67.1%	Lawrence, KS	71.8%	Lawrence, KS	68.4%	Midland, TX	65.9%
2	Hilton Head Island-Bluffton-Beaufort, SC	62.9%	Midland, TX	64.1%	Midland, TX	65.1%	Hilton Head Island-Bluffton-Beaufort, SC	63.6%	Hilton Head Island-Bluffton-Beaufort, SC	63.1%
3	Champaign-Urbana, IL	62.2%	Hilton Head Island-Bluffton-Beaufort, SC	63.3%	Hilton Head Island-Bluffton-Beaufort, SC	62.9%	Midland, TX	62.8%	Lawrence, KS	62.9%
4	La Crosse-Onalaska, WI-MN	61.9%	Houma-Thibodaux, LA	61.2%	Houma-Thibodaux, LA	60.2%	Lincoln, NE	62.2%	Flagstaff, AZ	59.7%
5	Logan, UT-ID	61.6%	Crestview-Fort Walton Beach-Destin, FL	61.1%	Lincoln, NE	59.9%	Manhattan, KS	60.2%	Houma-Thibodaux, LA	58.5%
6	Santa Cruz-Watsonville, CA	61.5%	Santa Cruz-Watsonville, CA	61.1%	Manhattan, KS	59.9%	Flagstaff, AZ	58.9%	Lincoln, NE	58.4%
7	Boston-Cambridge-Newton, MA-NH	60.5%	Salinas, CA	60.7%	Flagstaff, AZ	59.3%	Houma-Thibodaux, LA	58.7%	Santa Cruz-Watsonville, CA	57.6%
8	Lincoln, NE	60.1%	Lincoln, NE	60.7%	Santa Cruz-Watsonville, CA	59.2%	Bay City, MI	58.6%	Fargo, ND-MN	56.6%
9	Oxnard-Thousand Oaks-Ventura, CA	60.0%	Manhattan, KS	60.7%	La Crosse-Onalaska, WI-MN	58.8%	Charlottesville, VA	58.0%	Lake Charles, LA	56.5%
10	Florence, SC	60.0%	Bloomington, IL	59.6%	Bloomington, IL	58.6%	Santa Cruz-Watsonville, CA	57.6%	Charlottesville, VA	56.3%
MSAs with the Lowest Share for Indicator 4										
	2016		2015		2014		2013		2012	
10	Dalton, GA	34.2%	Tulsa, OK	34.6%	Spokane-Spokane Valley, WA	33.5%	Grants Pass, OR	32.4%	Lake Havasu City-Kingman, AZ	31.4%
9	Tulsa, OK	33.2%	Huntington-Ashland, WV-KY-OH	34.3%	Johnson City, TN	33.0%	Johnson City, TN	32.3%	Huntington-Ashland, WV-KY-OH	31.1%
8	Spokane-Spokane Valley, WA	33.0%	Dalton, GA	33.8%	Prescott, AZ	32.7%	Lake Havasu City-Kingman, AZ	32.0%	Spokane-Spokane Valley, WA	30.9%
7	Johnstown, PA	31.7%	Danville, IL	33.3%	Dalton, GA	32.6%	Sebring, FL	31.7%	Albany, OR	30.8%
6	Morgantown, WV	30.8%	Lake Havasu City-Kingman, AZ	33.2%	Longview, WA	32.4%	Kingsport-Bristol-Bristol, TN-VA	31.7%	Danville, IL	30.8%
5	Blacksburg-Christiansburg-Radford, VA	30.5%	Spokane-Spokane Valley, WA	32.9%	Carson City, NV	32.0%	Huntington-Ashland, WV-KY-OH	31.5%	Kingsport-Bristol-Bristol, TN-VA	30.6%
4	Lake Havasu City-Kingman, AZ	30.3%	Carson City, NV	32.9%	Blacksburg-Christiansburg-Radford, VA	31.7%	Johnstown, PA	30.9%	Muskegon, MI	30.3%
3	Danville, IL	30.1%	Johnstown, PA	32.1%	Danville, IL	31.0%	Longview, WA	30.5%	Blacksburg-Christiansburg-Radford, VA	30.0%
2	Sebring, FL	30.0%	Blacksburg-Christiansburg-Radford, VA	31.9%	Johnstown, PA	30.4%	Blacksburg-Christiansburg-Radford, VA	30.4%	Grants Pass, OR	29.9%
1	Enid, OK	29.9%	Enid, OK	31.5%	Enid, OK	30.0%	Danville, IL	28.6%	Sebring, FL	28.8%

Notes: The employment rate for individuals participating in HUD programs is calculated by dividing the total employed or full-time student, work-able population by the total overall work-able population across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages 18 through 64; individuals are considered employed if their wage income was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, PHA wages, military pay, and other wage income. Individuals are reported as full-time students if they are 18 years of age or older on the effective date of action and carry a subject load deemed full time by the standards and practices of the educational institution attended. Further clarification on HUD’s definitions of wage income or full-time student status can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-20 | Estimates for Nonmetropolitan Balances of States of Indicator 4: Percentage of HUD-Assisted, Work-Able Individuals Either Employed or in School Full Time

Indicator 4 for Nonmetropolitan Balances of States						
	State	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
1	Nebraska	57.5	59.1	61.0	59.0	57.6
2	Louisiana	54.8	54.9	54.7	54.4	52.3
3	Connecticut	54.7	51.5	55.8	51.5	54.1
4	Kansas	54.2	54.9	55.7	53.8	52.5
5	Texas	53.7	55.1	54.4	53.5	52.6
6	Minnesota	52.2	52.7	52.5	51.3	49.4
7	Maryland	51.9	51.4	51.4	50.4	47.9
8	Georgia	51.8	50.6	49.1	47.4	46.5
9	Hawaii	51.4	50.7	49.8	47.4	46.9
10	Florida	51.1	49.2	47.5	45.7	44.1
11	South Dakota	50.9	51.2	49.9	52.8	48.9
12	<i>New Hampshire</i>	50.8	51.4	49.9	48.6	47.7
13	North Dakota	50.4	54.0	51.2	54.9	55.2
14	Wisconsin	49.8	49.9	49.2	47.6	46.5
15	Alabama	48.6	48.4	47.3	46.4	45.5
16	Illinois	48.4	49.5	49.3	48.8	48.0
17	Wyoming	48.0	52.1	51.5	52.0	49.7
18	<i>Alaska</i>	47.9	45.4	44.7	45.2	43.2
19	Missouri	47.8	47.4	46.5	44.0	42.4
20	Colorado	47.7	47.7	46.6	46.7	46.0
21	Iowa	47.4	49.3	49.0	47.7	46.9
22	Vermont	47.2	45.1	43.0	41.8	40.1
23	Michigan	47.1	46.2	46.3	44.6	44.5
24	South Carolina	47.1	46.4	44.9	43.5	40.9
25	Idaho	46.9	42.2	42.6	42.0	42.8
26	North Carolina	46.7	46.5	45.4	43.7	43.1
27	New York	46.7	47.3	46.2	45.9	46.1
28	Arkansas	46.0	45.9	45.6	44.2	42.1
29	New Mexico	45.6	44.7	43.4	45.1	43.3
30	<i>Massachusetts</i>	45.5	42.7	41.9	41.9	40.7
31	Mississippi	45.3	44.8	42.6	42.3	42.5
32	Utah	44.5	44.2	41.9	46.2	46.4
33	Arizona	44.2	44.4	40.3	42.3	36.3
34	Oklahoma	43.9	44.6	45.6	45.2	44.7
35	California	43.5	41.2	41.5	42.1	39.6
36	Montana	43.3	43.8	43.9	44.9	43.3
37	Washington	43.2	42.1	42.1	40.5	39.2
38	Indiana	42.7	43.2	41.8	40.6	39.8
39	Pennsylvania	42.1	41.4	41.8	42.5	41.1
40	Tennessee	41.6	40.6	39.9	38.0	37.1
41	Oregon	40.7	40.2	39.6	36.9	35.9
42	Virginia	40.4	40.7	39.6	38.0	37.7
43	Ohio	37.4	37.9	36.6	35.8	34.3

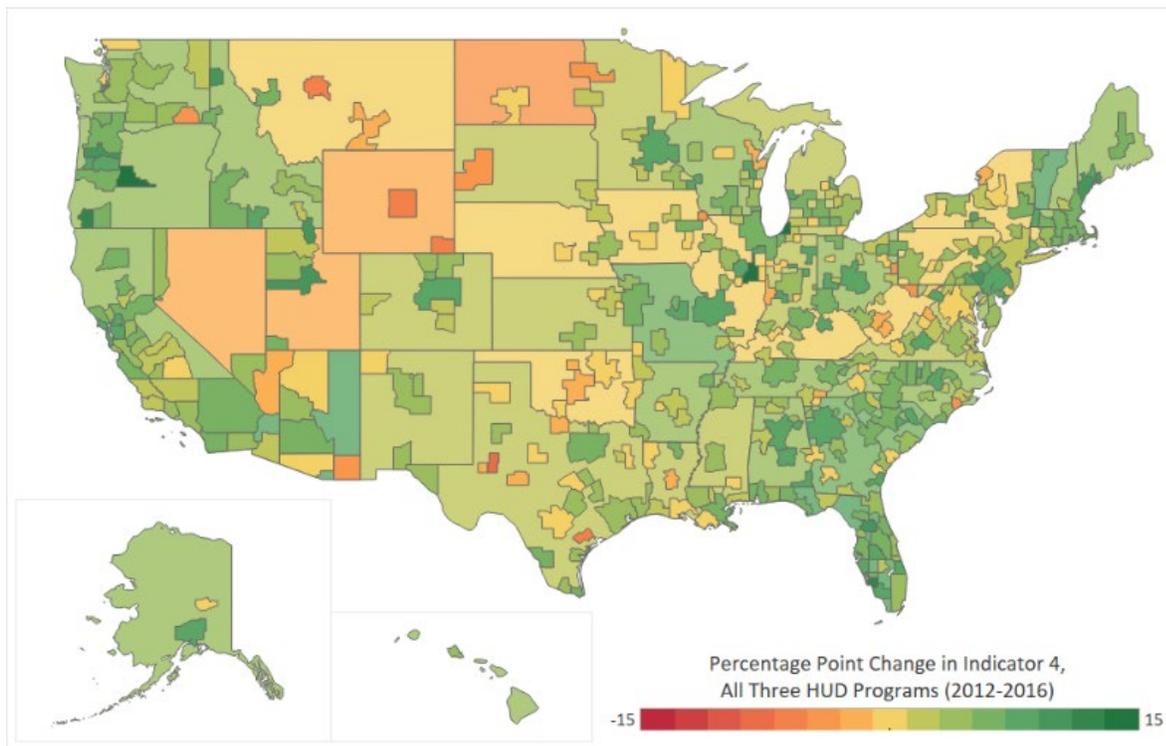
Indicator 4 for Nonmetropolitan Balances of States						
	State	2016 (%)	2015 (%)	2014 (%)	2013 (%)	2012 (%)
44	Kentucky	36.9	37.5	37.3	36.7	35.9
45	Maine	36.0	35.4	34.7	33.4	31.9
46	West Virginia	33.7	35.0	34.3	34.2	33.6
47	Nevada	33.5	32.8	33.8	36.6	35.5

Notes: The employment rate for individuals participating in HUD programs is calculated by dividing the total employed or full-time-student, work-able population by the total overall work-able population across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and between the ages of 18 and 64; individuals are considered employed if their wage income was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, PHA wages, military pay, and other wage income. Individuals are reported as full-time students if they are 18 years of age or older on the effective date of action and carry a subject load deemed full time by the standards and practices of the educational institution attended. Further clarification on HUD’s definitions of wage income or full-time student status can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-21 visually maps the percentage-point change in estimates of Indicator 4 for all three HUD programs of interest, from 2012 through 2016. This map shows that estimates of the rates of HUD-assisted individuals who are either employed or full-time students increased for most MSAs (87 percent) and nonmetropolitan balance areas. The nonmetropolitan balance of Arizona and the Champaign-Urbana, IL MSA experienced large increases in their stable household employment rates (7.9 percentage points and 17.9 percentage points, respectively). In contrast, decreases in estimates of Indicator 4 in nonmetropolitan areas appear concentrated across the Midwest and the Western parts of the United States (Nevada, North Dakota, Utah, and Wyoming), as well as in several MSAs across the country. The nonmetropolitan balance of North Dakota experienced a large (4.8) percentage-point decline in the rates of employed individuals and full-time students, and the Midland, TX MSA experienced a 7.3-percentage-point decline.

Exhibit 3-21 | Change in Indicator 4 Estimate Across All Three HUD Programs, From 2012 Through 2016: Percentage of HUD-Assisted, Work-Able Individuals Either Employed or in School Full Time



Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

3.5 MSAs and Nonmetropolitan Balance of State Trends Across All Four Indicators

To estimate the top 10- and bottom 10-performing MSAs, each of the four indicators across all three HUD programs was added after scaling the indicators such that the highest value of each estimate is 1.⁴¹ Exhibit 3-22 illustrates the MSAs that have consistently high and low estimates across all indicators. The top 10 MSAs may be of interest to policymakers in examining strategies employed by the PHAs that operate in the MSAs—strategies that may increase self-sufficiency and economic stability among HUD-assisted households and individuals and possibly could be applied in the bottom 10 MSAs (considering similar context). Five MSAs consistently appear in the top 10 across the 5-year period: Flagstaff, AZ; Hilton Head Island-Bluffton-Beaufort, SC; Lawrence, KS; Santa Cruz-Watsonville, CA; and Santa Maria-Santa Barbara, CA. Five MSAs appear in the bottom 10 across all 5 years: Blacksburg-Christiansburg-Radford, VA; Danville, IL; Johnstown, PA; Kingsport-Bristol-Bristol, TN-VA; and Tulsa, OK. Exhibit 3-23 illustrates the nonmetropolitan balance of each state, ranked by the sum of their estimates across all indicators. Six nonmetropolitan balances of state appear in the top 10 in each of the 5 years: Hawaii, Kansas, Louisiana, Maryland, Nebraska, and Texas. Similarly, seven states appear in the bottom 10 each year: Indiana, Kentucky, Maine, Ohio, Tennessee, Virginia, and West Virginia.

⁴¹ Other methods of scaling or weighting the indicators are possible; for example, the MSA rank values for the indicators could be averaged.

Exhibit 3-22 | MSAs with the Highest and Lowest Values for All Indicators Across All Three HUD Programs

MSAs with the Highest Values Across the Four Indicators						
2016	2015	2014	2013	2012		
1	<i>Lawrence, KS</i>	<i>Lawrence, KS</i>	<i>Lawrence, KS</i>	<i>Lawrence, KS</i>	<i>Lawrence, KS</i>	
2	Santa Cruz-Watsonville, CA	Manhattan, KS	Midland, TX	Midland, TX	Flagstaff, AZ	
3	<i>Champaign-Urbana, IL</i>	Santa Cruz-Watsonville, CA	Santa Cruz-Watsonville, CA	Flagstaff, AZ	Midland, TX	
4	Flagstaff, AZ	Santa Maria-Santa Barbara, CA	Santa Maria-Santa Barbara, CA	Santa Cruz-Watsonville, CA	Santa Cruz-Watsonville, CA	
5	Salinas, CA	Midland, TX	Flagstaff, AZ	Santa Maria-Santa Barbara, CA	Santa Maria-Santa Barbara, CA	
6	Santa Maria-Santa Barbara, CA	Hilton Head Island-Bluffton-Beaufort, SC	Manhattan, KS	Hilton Head Island-Bluffton-Beaufort, SC	Hilton Head Island-Bluffton-Beaufort, SC	
7	Hilton Head Island-Bluffton-Beaufort, SC	Salinas, CA	Hilton Head Island-Bluffton-Beaufort, SC	Manhattan, KS	<i>Visalia-Porterville, CA</i>	
8	San Luis Obispo-Paso Robles-Arroyo Grande, CA	Flagstaff, AZ	Salinas, CA	<i>Lincoln, NE</i>	San Luis Obispo-Paso Robles-Arroyo Grande, CA	
9	Oxnard-Thousand Oaks-Ventura, CA	Logan, UT-ID	San Luis Obispo-Paso Robles-Arroyo Grande, CA	Salinas, CA	Manhattan, KS	
10	Logan, UT-ID	Crestview-Fort Walton Beach-Destin, FL	<i>Visalia-Porterville, CA</i>	San Luis Obispo-Paso Robles-Arroyo Grande, CA	Oxnard-Thousand Oaks-Ventura, CA	
MSAs with the Lowest Values Across the Four Indicators						
2016	2015	2014	2013	2012		
10	Cleveland, TN	Homosassa Springs, FL	Johnson City, TN	Sebring, FL	Huntington-Ashland, WV-KY-OH	
9	Morgantown, WV	Huntington-Ashland, WV-KY-OH	Kingsport-Bristol-Bristol, TN-VA	Tulsa, OK	Prescott, AZ	
8	Kingsport-Bristol-Bristol, TN-VA	Johnson City, TN	Tulsa, OK	Muskegon, MI	Danville, IL	
7	Sebring, FL	Carson City, NV	Carson City, NV	Dalton, GA	Longview, WA	
6	Lake Havasu City-Kingman, AZ	Kingsport-Bristol-Bristol, TN-VA	Prescott, AZ	Huntington-Ashland, WV-KY-OH	Tulsa, OK	
5	Tulsa, OK	Tulsa, OK	Blacksburg-Christiansburg-Radford, VA	Kingsport-Bristol-Bristol, TN-VA	Johnstown, PA	
4	Blacksburg-Christiansburg-Radford, VA	Blacksburg-Christiansburg-Radford, VA	Dalton, GA	Blacksburg-Christiansburg-Radford, VA	Muskegon, MI	
3	Johnstown, PA	Danville, IL	Danville, IL	Longview, WA	Blacksburg-Christiansburg-Radford, VA	
2	Enid, OK	Johnstown, PA	Enid, OK	Johnstown, PA	Kingsport-Bristol-Bristol, TN-VA	
1	Danville, IL	Enid, OK	Johnstown, PA	Danville, IL	Enid, OK	

Notes: The total value across the four indicators was estimated using a weighted total of the four indicators in each year. The weighted values of each indicator were calculated by normalizing the indicators on a scale of 0 to 1, using the maximum value for that indicator in each year, and then adding the weighted values for each indicator. Values are bolded and italicized for areas served by MTW PHAs. One MSA (The Villages, FL) is not included in these rankings due to lack of observations.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit 3-23 | Nonmetropolitan Balances of States, Ranked by Value Across All Indicators

Nonmetropolitan Balances of States, Ranked by Value Across All Indicators					
	2016	2015	2014	2013	2012
1	Hawaii	Nebraska	Nebraska	Nebraska	Nebraska
2	Nebraska	Hawaii	Louisiana	Louisiana	North Dakota
3	Louisiana	Louisiana	Hawaii	Texas	Louisiana
4	Alaska	Texas	Kansas	North Dakota	Texas
5	Connecticut	Kansas	Texas	Kansas	Connecticut
6	Texas	Maryland	Connecticut	Hawaii	Kansas
7	Florida	New Hampshire	Maryland	Maryland	Hawaii
8	Maryland	North Dakota	North Dakota	Wyoming	Alaska
9	Kansas	Wyoming	Minnesota	South Dakota	Wyoming
10	New Hampshire	Minnesota	New Hampshire	Connecticut	Maryland
11	Minnesota	Florida	Wyoming	Alaska	New Hampshire
12	Georgia	Alaska	Florida	Minnesota	Minnesota
13	South Dakota	South Dakota	South Dakota	New Hampshire	Illinois
14	North Dakota	Connecticut	Illinois	Illinois	South Dakota
15	Arizona	Georgia	Alaska	Florida	New York
16	Wyoming	Illinois	Georgia	New York	Florida
17	Alabama	Arizona	Wisconsin	Georgia	Wisconsin
18	Wisconsin	Wisconsin	Alabama	New Mexico	Georgia
19	Illinois	Alabama	New York	Alabama	Colorado
20	New York	Colorado	Michigan	Oklahoma	Alabama
21	Michigan	New York	Colorado	Wisconsin	Oklahoma
22	Colorado	Michigan	Missouri	Colorado	New Mexico
23	New Mexico	Missouri	Oklahoma	Montana	Michigan
24	Missouri	New Mexico	Iowa	Michigan	Utah
25	Vermont	Iowa	New Mexico	Iowa	Montana
26	Massachusetts	South Carolina	Washington	Missouri	Iowa
27	Washington	Montana	Arkansas	Arizona	Missouri
28	California	Oklahoma	Arizona	Utah	Washington
29	South Carolina	Arkansas	Montana	Arkansas	Idaho
30	Iowa	Vermont	California	Washington	Mississippi
31	Idaho	Washington	Utah	California	California
32	Arkansas	California	South Carolina	South Carolina	Arkansas
33	North Carolina	North Carolina	North Carolina	Pennsylvania	North Carolina
34	Montana	Utah	Idaho	Vermont	Pennsylvania
35	Mississippi	Massachusetts	Vermont	Mississippi	Massachusetts
36	Oregon	Mississippi	Mississippi	North Carolina	Nevada
37	Oklahoma	Idaho	Pennsylvania	Idaho	South Carolina
38	Tennessee	Oregon	Oregon	Massachusetts	Vermont
39	Utah	Pennsylvania	Massachusetts	Nevada	Oregon
40	Pennsylvania	Tennessee	Tennessee	Oregon	Indiana
41	Indiana	Indiana	Indiana	Indiana	Kentucky
42	Virginia	Virginia	Kentucky	Tennessee	Arizona
43	Kentucky	Kentucky	Virginia	Kentucky	Tennessee
44	Nevada	Ohio	Nevada	Virginia	Virginia

Nonmetropolitan Balances of States, Ranked by Value Across All Indicators					
	2016	2015	2014	2013	2012
45	Ohio	West Virginia	Ohio	Ohio	West Virginia
46	Maine	Nevada	West Virginia	West Virginia	Ohio
47	West Virginia	Maine	Maine	Maine	Maine

Notes: The total value across the four indicators was estimated using a weighted total of the four indicators in each year. The weighted values of each indicator were calculated by normalizing the indicators on a scale of 0 to 1, using the maximum value for that indicator in each year, and then adding the weighted values for each indicator. Values are bolded and italicized for areas served by MTW PHAs.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

4 CONCLUSION

This study estimates four indicators of economic opportunity, self-sufficiency, and financial stability for work-able individuals receiving benefits from three housing assistance programs: public housing, housing choice voucher (HCV), and assisted multifamily. These indicators further our understanding of the economic well-being of HUD-assisted households and individuals, how the economic characteristics of the HUD-assisted population compare with those of the overall population, and how to use HUD administrative data and American Community Survey (ACS) data to estimate those metrics. Such measures of self-sufficiency and economic opportunity can help inform national and local housing policies.

OVERVIEW OF THE FINDINGS

Overall, estimates for all four indicators show increases, indicating financial stability and self-sufficiency of HUD-assisted households and individuals across each of the three HUD housing assistance programs. Although the estimates for each program increase over time, the estimates are consistently higher for public housing and HCV programs compared with assisted multifamily programs, for reasons not examined in this study. Those gains were observed during a time of overall economic growth, so increases in the estimates of Indicators 2 and 4 over time may be expected; however, observed gains in Indicators 1 and 3 illustrate that the increases in the HUD-assisted population are greater than the increases in the overall population due to the economic growth. These indicators are promising metrics of economic opportunity that can help HUD monitor progress and improvement nationally and across metropolitan areas. Such indicators can help focus efforts and resources on public housing authorities (PHAs) and other housing providers where results are lagging relative to their metropolitan areas. These metrics can also be estimated for individual housing providers if that should prove worthwhile.

We would like to caution the reader, however, that certain data limitations on these estimates should be taken into consideration when interpreting the results. Those limitations largely stem from slight inconsistencies between HUD and ACS data definitions that may affect Indicators 1 and 3. Indicator 2 also has the limitation of relying on 3 years of data for a given household, and therefore excluding households that exit HUD programs within 3 years. Such households that exit more quickly may have relatively high levels of work stability. Furthermore, Indicator 4 potentially underestimates the population of full-time students receiving HUD assistance for public housing and vouchers due to data collection issues with that variable, and the use of “dependent” as a proxy for students in multifamily housing also has unproven reliability. Details of the limitations of each indicator are presented in Exhibit 2-2. In addition, we present one main caveat: the estimates of each indicator are descriptive and do not imply causality. For example, increases in indicators for a particular program should not be interpreted as causal relationships between that HUD program and the indicator.

Indicator 1 is the ratio of the employment rate for the work-able, HUD-assisted population to the employment rate for the work-able general population. The ratio across all three HUD programs increased by almost 6 percentage points, from 0.535 in 2012 to 0.590 in 2016. Overall, these estimates suggest a convergence between the employment rates for HUD-assisted individuals and those for the overall population.

Indicator 2 is the share of work-able, HUD-assisted households with stable employment for 3 years. From 2012 through 2016, the stable household employment rates for Indicator 2 for public housing, HCV, and multifamily programs each increased by more than 3 percentage points.

Indicator 3 is the ratio of the full-time employment rate for the work-able, HUD-assisted population to the full-time employment rate for the work-able general population. The national-level estimates of Indicator 3 show that the full-time employment rate for the HUD-assisted population is nearly one-half that of the overall population. Although the full-time employment rate for the HUD-assisted population is lower than that of the overall population, increases in estimates of Indicator 3 over time suggest a slight convergence in the full-time employment rates of the two populations.

Indicator 4 is the percentage of work-able HUD-assisted individuals who are either employed or full-time students. Estimates of Indicator 4 illustrate that nearly 50 percent of the work-able, HUD-assisted population is either employed or attending school full time. From 2012 through 2016, the estimates of Indicator 4 for public housing, HCV, and multifamily programs each increased by approximately 4 percentage points, suggesting an increase in the share of HUD-assisted individuals who are either employed or in school full time.

USE FOR ACCOUNTABILITY AND POLICYMAKING

Estimates of these metrics may be used to monitor and support progress toward HUD's agency priority goals, described in Chapter 1, and offer evidence to provide enhanced accountability for HUD's stakeholders. For these indicators to be useful to policymakers, however, the indicators must provide useful and accurate estimates of the economic opportunities and financial stability of HUD-assisted populations in a way that complements other sources of qualitative and quantitative evidence.

These indicators may be used by federal, state, and local government agencies and other stakeholders to inform policy priorities that target areas and communities in need of assistance. Areas that have consistently demonstrated a high degree of financial stability and self-sufficiency among the program participants may potentially provide examples of policies that have been successful in making progress toward these goals (and understanding the context in which these policies may operate). For example, Lawrence, KS and Santa Cruz-Watsonville, CA have consistently high estimates across all indicators. The Champaign-Urbana, IL metropolitan statistical area (MSA), however, had the largest increase for all four indicators from 2012 to 2016.⁴² Five MSAs in California (Salinas, San Luis Obispo-Paso Robles-Arroyo Grande, Santa Cruz-Watsonville, Santa Maria-Santa Barbara, and Visalia-Porterville) consistently appear in the top 10 estimates for Indicator 3. Summing all four indicators, Lawrence, KS; Santa Cruz-Watsonville, CA; Flagstaff, AZ; Santa Maria-Santa Barbara, CA; and Hilton Head Island-Bluffton-Beaufort, SC consistently appear in the top 10 MSAs across the 5 years. Local agencies, governments, or PHAs may have enacted strategies targeted at the HUD-assisted population in those MSAs that contributed to those improvements. Such strategies may be replicable for other MSAs and nonmetropolitan balances of each state to support areas in need of improvement.

These indicators may be helpful in the implementation, monitoring, and evaluation of other HUD programs, including Section 3 and EnVision Centers, that were established to improve the labor market

⁴² Champaign-Urbana, IL increased from 0.561 in 2012 to 0.843 in 2016 for Indicator 1; had a 25.5 percentage point increase in Indicator 2; increased from 0.834 in 2012 to 0.959 in 2016 for Indicator 3; and experienced a 17.9 percentage point increase in Indicator 4.

outcomes of HUD-assisted populations. Section 3 of the HUD Act of 1968 was designed to promote local economic development and self-sufficiency among HUD program participants. Section 3 supplies the framework “for providing jobs for residents and awarding contracts to businesses in areas receiving certain types of HUD financial assistance” (HUD, n.d.). EnVision Centers were recently established to ensure that HUD-assisted individuals have access to support services in the areas of economic empowerment, educational advancement, health and wellness, and character and leadership (HUD, 2018a). If a relatively low share of the HUD-assisted population is employed, based on the indicators, then Section 3 and EnVision Centers could be used to target labor market opportunities for HUD-assisted populations in those areas. The success of other programs such as Family Self-Sufficiency and Jobs-Plus also can be assessed partly by using these indicators to characterize tenants’ self-sufficiency relative to the economic context of their metropolitan areas and relative to national program averages.

The findings from this study provide key insights into estimating four indicators related to self-sufficiency, financial stability, and economic opportunity for HUD-assisted populations at the national level for each MSA and nonmetropolitan balance of state. These indicators illustrate that the labor market and employment outcomes of the HUD-assisted population have improved since 2012. The indicators can be helpful to assess the economic opportunities of the HUD-assisted population and can be easily adapted in the monitoring and evaluations of other HUD programs geared toward providing employment opportunities, thereby supporting the goals of increasing self-sufficiency and financial stability among HUD-assisted populations.

APPENDIX A—DETAILS OF DATA-CLEANING PROCESS

The study team conducted the data-cleaning process in three stages to address potential data duplication, usability, and adjustments for project-specific requirements. The U.S Department of Housing and Urban Development (HUD) provided longitudinal data files developed from household records contained in their Inventory Management System/Public and Indian Housing Information Center (IMS/PIC) system and Tenant Rental Assistance Certification System (TRACS). Programmatic data on participating households and individual household members were extracted from these sources, harmonized, and provided to the study team as annual datasets for years 2010 through 2016. Each data source was cleaned separately (Stage 1), merged (Stage 2), and then prepared for the estimation of each indicator (Stage 3). A few differences existed in the data-cleaning process for each indicator. For example, because households serve as the unit of analysis for Indicator 2, this indicator required slightly different assumptions for preprocessing, as work-ability was determined at the household level. A description of our data-cleaning process follows, and Exhibit A-1 provides a visual depiction of the data-cleaning process.

Stage 1: This stage involved cleaning the household and household member datasets from 2010 through 2016. The first step was to drop head-of-household observations (in the household dataset) that were exact duplicates in a given year,⁴³ followed by keeping only the most recent observations that were duplicates in terms of the head-of-household ID and the corresponding source of data⁴⁴ so that only one observation remained for each household in each year. In the final step of cleaning the household dataset, we dropped any observations with missing geographic identifiers for counties, as these observations could not be aggregated to the metropolitan statistical area level. Exact figures on the number of dropped observations for each step are provided in Exhibit A-2.

For the household member dataset for Indicators 1, 3, and 4, our first step was to keep observations for populations ages 18 through 64 for each yearly dataset. Those members outside the age range of interest were not dropped for cleaning the household member file for Indicator 2. Next, for all four indicators, the study team checked for duplicate observations in terms of all variables (“exact duplicates”) and, later, for any head-of-household-member duplicates. Similar to the procedures conducted in cleaning the head-of-household file, household-member duplicate observations were dropped so that only one observation remained for each household member in each year. Exact figures on the number of dropped observations for each procedure are provided in Exhibit A-3 and Exhibit A-4.

Stage 2: The second stage of data cleaning centered around addressing observations outside the 50 states and the District of Columbia. After merging the 2017 Core Based Statistical Area (CBSA) delineation file with the head-of-household datasets, observations from U.S. territories were dropped using three geographic indicators. Using multiple geographic indicators allowed observations with inconsistent or missing geographical characteristics to be more certainly excluded. Because the

⁴³ “Exact duplicates” are duplicate observations in terms of all variables.

⁴⁴ The longitudinal dataset defines data sources by form types: in IMS/PIC data, “58” for form HUD-50058, “MTW” for form HUD-50058 MTW, and “TRACS” for HUD-50059 forms.

delineation variable would be present only for counties within a CBSA, additional HUD variables for state-level Federal Information Processing Standards (FIPS) codes and abbreviations were also used.

For the final step in Stage 2, the study team matched the current records with a list of Moving to Work (MTW) public housing authorities and merged together the current head-of-household datasets with their corresponding member files. Member records without matching head-of-household ID observations were dropped⁴⁵ because the head-of-household file contains geographic and other household information necessary for analysis. Exact figures for the number of dropped observations for each procedure and merge results are provided in Exhibit A-5.

Stage 3: The final stage of data cleaning adjusted the merged files to reflect nondisabled populations of HUD participants in the three programs of interest (public housing, housing choice voucher [HCV], and assisted multifamily). This meant that observations were dropped if either the member was disabled or the records did not align with the program categories outlined in Exhibit A-6. In addition, end-of-participation transactions were dropped at this stage because such households exited HUD programs during the year of interest. Counts of dropped observations for Indicators 1, 3, and 4 are provided in Exhibit A-7 and for Indicator 2 in Exhibit A-8.

In Exhibits A-9 and A-10, we present the variables used from the HUD longitudinal file for the key terms listed in Exhibit 2-1, namely work-ability, income, and full-time student status.

⁴⁵Member records may not have an associated head-of-household during the merge process because associated head-of-household observations were dropped due to missing geographic identifiers or if those member records were from U.S. territories.

Exhibit A-1 | Overview of the Data-Cleaning Process

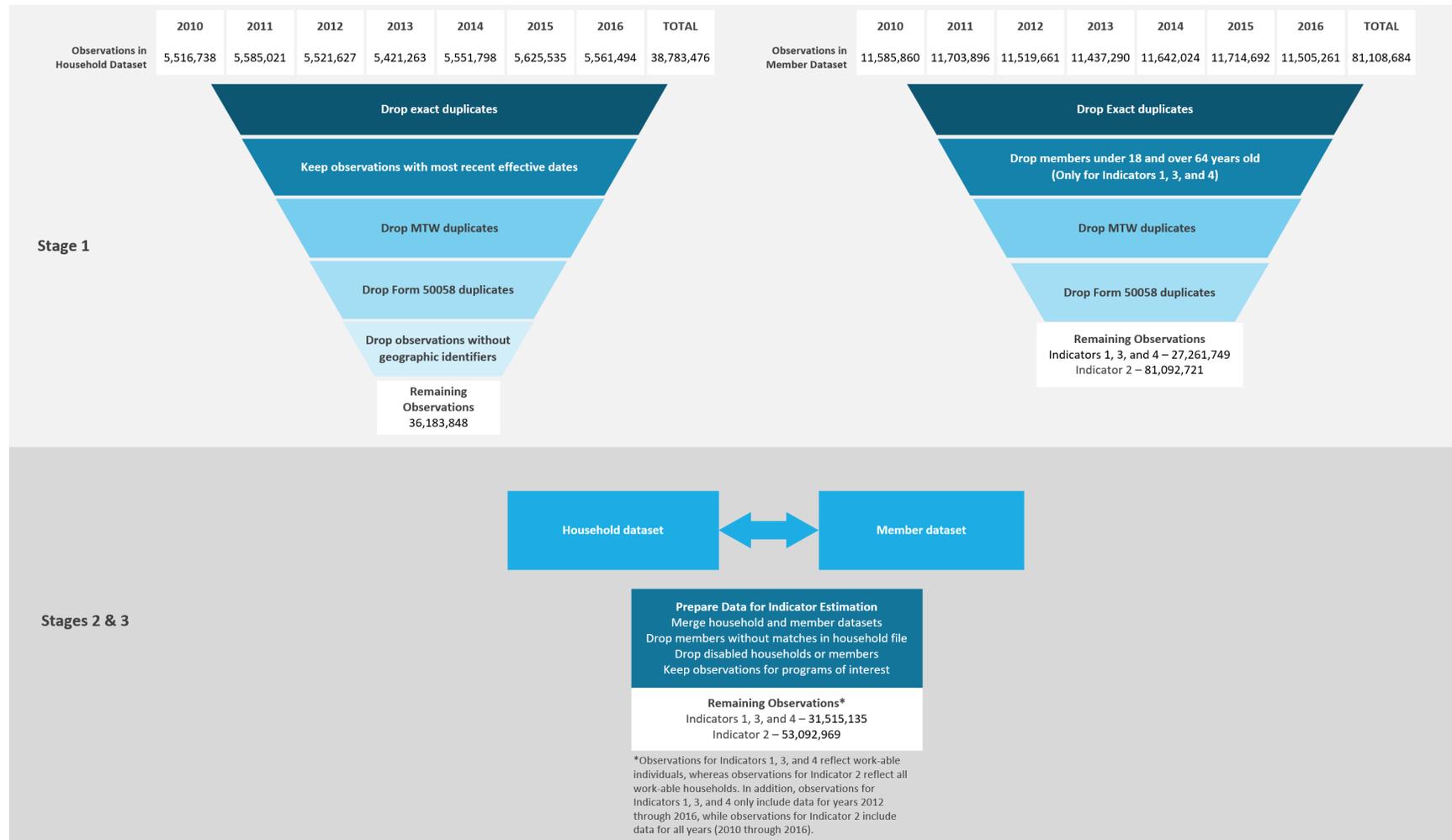


Exhibit A-2 | Head-of-Household Data Cleaning in Stage 1

Procedure	Observations							Total
	2010	2011	2012	2013	2014	2015	2016	
Initial Head-of-Household Count	5,516,738	5,585,021	5,521,627	5,421,263	5,551,798	5,625,535	5,561,494	38,783,476
Drop exact duplicates	—	1	303	—	—	—	13,089	13,393
For observations with household and form duplicates, keep observations with most recent effective date	4	11	4	—	—	—	—	19
For observations with household and form duplicates, keep one observation in which effective dates are the same	63	5	54	8	91	3	1,271	1,495
For observations with duplicate households, drop HUD-50058 MTW observations ^a	81,244	73,970	4,880	3,537	8,081	10,471	7,015	189,198
For observations with duplicate households, keep observations with most recent effective date	48,829	49,653	46,143	43,363	43,467	53,027	49,700	334,182
For observations with duplicate households, drop Form HUD-50058 observations for which effective dates are the same ^b	2,846	2,470	2,554	2,229	2,205	2,373	2,364	17,041
Drop observations of households with missing geographic identifiers	288,874	287,780	290,837	246,508	318,400	332,604	279,297	2,044,300
Stage 1 Final Head-of-Household Count	5,094,878	5,171,131	5,176,852	5,125,618	5,179,554	5,227,057	5,208,758	36,183,848

— = 0.

^a Such cases occur when the household transaction is reported in more than one database or form (Form HUD-50058, HUD-50058 MTW, and TRACS), so household transactions are observed in HUD-50058 MTW and Form HUD-50058 and/or TRACS. In those cases, we dropped the observations associated with HUD-50058 MTW, given that the household characteristics were also associated with the Form HUD-50058 and TRACS observations.

^b This situation can occur when the transaction is reported in more than one database (that is, PIC and TRACS). Since effective dates of the transactions do not differ, we retain the observation related to the multifamily program reported in the TRACS database.

Exhibit A-3 | Household Member Data Cleaning in Stage 1 for Indicators 1, 3, and 4

Procedure	Observations					Total
	2012	2013	2014	2015	2016	
Initial Member Count	11,519,661	11,437,290	11,642,024	11,714,692	11,505,261	57,818,928
Drop members younger than 18 years old or older than 64 years old ^a	6,124,588	6,060,770	6,130,848	6,163,799	6,076,727	30,556,732
Drop exact duplicates	—	—	—	—	—	0
For observations with duplicate household-member, drop HUD-50058 MTW observations	5	8	35	51	11	110
For observations with duplicate household-member, drop Form HUD-50058 observations	68	71	60	81	67	347
Stage 1 Final Member Count for Indicators 1, 3, and 4	5,395,010	5,376,441	5,511,081	5,550,761	5,428,456	27,261,749

— = 0.

^a These members are dropped at this stage only for Indicators 1, 3, and 4 because those indicators rely on a work-able member-level dataset. In contrast, Indicator 2 relies on a household-level dataset, and dropping such members would potentially remove heads of household that fall outside the age range but have work-able members in their households. See Exhibit A-4 for the Stage 1 data-cleaning process for Indicator 2.

Exhibit A-4 | Household Member Data Cleaning in Stage 1 for Indicator 2

Procedure	Observations						Total	
	2010	2011	2012	2013	2014	2015		2016
Initial Member Count	11,585,860	11,703,896	11,519,661	11,437,290	11,642,024	11,714,692	11,505,261	81,108,684
Drop exact duplicates	—	—	—	—	—	—	—	0
For observations with duplicate household-member, drop HUD-50058 MTW observations	2,349	1,607	100	106	255	326	188	4,931
For observations with duplicate household-member, drop Form HUD-50058 observations	1,618	1,758	1,550	1,314	1,313	1,812	1,667	11,032
Stage 1 Final Member Count for Indicator 2	11,581,893	11,700,531	11,518,011	11,435,870	11,640,456	11,712,554	11,503,406	81,092,721

— = 0.

Exhibit A-5 | Additional Head-of-Household Data Cleaning and Household-Member Merge in Stage 2

Procedure	Observations							Total
	2010	2011	2012	2013	2014	2015	2016	
Stage 1 Final Head-of-Household	5,094,878	5,171,131	5,176,852	5,125,618	5,179,554	5,227,057	5,208,758	36,183,848
Drop observations from U.S. territories (using delineation file variable "state")	104,378	106,759	106,978	106,448	106,001	106,635	106,565	743,764
Drop observations from U.S. territories (unit_fips_state_cd)	5,713	5,829	5,904	6,070	9,282	9,553	9,536	51,887
Drop observations from U.S. territories (unit_state_cd), and drop missing observations	5	8	5	14	17	1	5	55
Head-of-Household Observations Before Merging Member Files	4,984,782	5,058,535	5,063,965	5,013,086	5,064,254	5,110,868	5,092,652	35,388,142
Members After Household-Member Merge for Indicators 1, 3, and 4	—	—	6,287,261	6,238,478	6,316,843	6,360,792	6,311,761	31,515,135
Members with Matching Head-of-Household for Indicators 1,3, and 4 ^a	—	—	4,988,989	4,954,895	5,011,275	5,025,836	4,966,545	34,668,507
Members After Household-Member Merge for Indicator 2	10,518,376	10,651,634	10,692,385	10,559,180	10,624,284	10,656,968	10,560,152	53,092,969
Members with Matching Head-of-Household for Indicator 2 ^a	10,430,858	10,570,595	10,646,012	10,537,126	10,604,359	10,632,930	10,539,646	73,961,524

— = 0.

^a Member records may not have an associated head of household during the merge process as a result of heads of household being dropped through the data-cleaning process. For example, head-of-household observations were dropped due to observations with missing geographic identifiers or if the member records were from U.S. territories.

Exhibit A-6 | List of HUD Program and Subsidy Categories Included

Program or Subsidy Category	Specific Program or Subsidy Type
Public Housing	P = Public Housing
	CE = Section 8 Certificates
Housing Choice Voucher	H = MTW Homeownership Voucher
	PR = MTW Project-Based Voucher
	T = MTW Tenant-Based Voucher
	VO = Section 8 Vouchers
Multifamily	H1 = Project-Based Section 8
	H2 = Rent Supplement
	H3 = RAP
	H6 = HUD-Owned/Held
	H7 = Section 202 PRAC
	H8 = Section 811 PRAC
	H9 = Section 202/162 PRAC

Notes: Specific program type (in IMS/PIC) and subsidy type (in TRACS) are determined using the longitudinal file variable *pgm_type_cd*. Transactions related to the Moderate Rehabilitation program type (in IMS/PIC data) and the Section 236 (H4) and Below Market Interest Rate (H5) unassisted multifamily subsidy types (in TRACS data) are not included in the analysis.

Exhibit A-7 | Data Cleaning for Indicators 1, 3, and 4 in Stage 3

Procedure	Observations					Total
	2012	2013	2014	2015	2016	
Member Count (Row 6 of Exhibit A-5)	6,287,261	6,238,478	6,316,843	6,360,792	6,311,761	31,515,135
Drop observations not categorized as Public Housing, HCV, or Assisted Multifamily	94,411	88,358	79,642	70,208	62,056	394,675
Drop observations with end-of-participation codes	622,875	622,924	669,080	691,586	662,974	3,269,439
Drop heads of household younger than 18 years old or older than 64 years old	1,142,061	1,136,598	1,155,318	1,179,710	1,195,120	5,808,807
Drop observations of disabled members (mbr_dsblty_indr="Y" or missing)	1,323,123	1,318,200	1,329,452	1,337,606	1,338,732	6,647,113
Work-Able Members for Indicators 1, 3, and 4	3,104,791	3,072,398	3,083,351	3,081,682	3,052,879	15,395,101

Exhibit A-8 | Data Cleaning for Indicator 2 in Stage 3

Procedure	Observations					Total
	2012	2013	2014	2015	2016	
Member Count (Row 8 of Exhibit A-5)	10,692,385	10,559,180	10,624,284	10,656,968	10,560,152	53,092,969
Drop observations not categorized as Public Housing, HCV, or Assisted Multifamily	136,758	126,579	113,782	99,650	87,296	564,065
Drop observations with end-of-participation codes	1,064,891	1,066,689	1,129,464	1,154,723	1,115,550	5,531,317
Stage 3 Final Member Count	9,490,736	9,365,912	9,381,038	9,402,595	9,357,306	46,997,587
Stage 3 Final Household Count	4,467,738	4,425,166	4,455,338	4,494,405	4,498,112	22,340,759
Work-Able Households for Indicator 2	2,328,502	2,296,688	2,300,748	2,306,481	2,291,047	11,523,466

Exhibit A-9 | Variables Used to Determine Work-Ability

Variable Description	Variable Name	Criteria	Variable Source
Age	mbr_age_yr_cnt	Ages 18 through 64	HUD
Disability	mbr_dsblty_indr	Not disabled	HUD

Exhibit A-10 | Variables for Each Indicator

Indicator	Variable Needed	Criteria	Variable Source	Unit of Analysis
1. Ratio between HUD-assisted and overall population employment rates	mbr_wage_incm_amnt	Greater than \$500	HUD	Individual
2. Percentage of HUD-assisted, work-able households having stable employment over 3 years	total_wage_incm_amnt	Greater than \$500 per year over the past 3 years	HUD	Household
3. Ratio between HUD-assisted and overall population rates of full-time employment	mbr_wage_incm_amnt	Greater than \$12,500	HUD	Individual
4. Percentage of HUD-assisted, work-able individuals who are either working or in school	mbr_rltn_cd	E = full-time student 18+ (IMS/PIC) D = dependent or other child (TRACS)	HUD	Individual
	mbr_wage_incm_amnt	Greater than \$500		

APPENDIX B—QUARTILE MEANS OF MSA-LEVEL EMPLOYMENT AND FULL-TIME EMPLOYMENT RATES FOR HUD-ASSISTED AND OVERALL POPULATION

Exhibit B-1 | Mean Employment Rate of the HUD-Assisted Population (Numerator of Indicator 1) by Quartile of MSA-Level Estimates of Indicator 1

Across All Three HUD Programs				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.339	0.389	0.420	0.461
2013	0.353	0.398	0.433	0.469
2014	0.367	0.415	0.446	0.482
2015	0.381	0.426	0.454	0.491
2016	0.387	0.428	0.457	0.499
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.348	0.431	0.473	0.540
2013	0.367	0.439	0.486	0.555
2014	0.385	0.463	0.502	0.572
2015	0.407	0.474	0.516	0.584
2016	0.412	0.482	0.517	0.581
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.338	0.394	0.429	0.487
2013	0.350	0.404	0.446	0.493
2014	0.364	0.414	0.459	0.505
2015	0.382	0.428	0.470	0.510
2016	0.394	0.434	0.474	0.520
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.257	0.306	0.362	0.428
2013	0.270	0.319	0.375	0.438
2014	0.281	0.334	0.387	0.454
2015	0.285	0.339	0.394	0.459
2016	0.285	0.346	0.400	0.458

Notes: This table presents the mean employment rates of the HUD-assisted, work-able population for MSAs and nonmetropolitan balances of each state in the given quartile of Indicator 1. The MSA-level employment rates for the HUD-assisted population are the numerators used to calculate Indicator 1. Quartile-level mean estimates of employment rates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state in that quartile.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit B-2 | Mean Employment Rate of the Overall MSA Population (Denominator of Indicator 1) by Quartile of MSA-Level Estimates of Indicator 1

Across All Three HUD Programs				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.744	0.753	0.745	0.735
2013	0.742	0.740	0.742	0.729
2014	0.744	0.745	0.740	0.734
2015	0.752	0.754	0.747	0.736
2016	0.763	0.759	0.750	0.747
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.750	0.754	0.733	0.728
2013	0.744	0.746	0.731	0.718
2014	0.749	0.748	0.732	0.719
2015	0.758	0.745	0.741	0.726
2016	0.767	0.757	0.745	0.730
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.739	0.753	0.742	0.736
2013	0.735	0.739	0.743	0.730
2014	0.740	0.737	0.747	0.728
2015	0.746	0.744	0.754	0.732
2016	0.760	0.750	0.754	0.752
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.749	0.739	0.749	0.751
2013	0.744	0.731	0.744	0.746
2014	0.745	0.739	0.744	0.749
2015	0.748	0.753	0.750	0.751
2016	0.757	0.760	0.760	0.753

Notes: This table presents the mean employment rates of the overall work-able population for MSAs and nonmetropolitan balances of each state in the given quartile of Indicator 1. The MSA-level employment rates for the overall population are the denominators used to calculate Indicator 1. Quartile-level mean estimates of employment rates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state in that quartile.

Sources: American Community Survey (ACS) 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit B-3 | Mean Full-Time Employment Rate of the HUD-Assisted Population (Numerator of Indicator 3) by Quartile of MSA-Level Estimates of Indicator 3

Across All Three HUD Programs				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.157	0.194	0.221	0.284
2013	0.163	0.204	0.233	0.293
2014	0.178	0.217	0.248	0.305
2015	0.193	0.238	0.264	0.325
2016	0.203	0.247	0.278	0.340
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.170	0.225	0.270	0.344
2013	0.181	0.237	0.280	0.349
2014	0.195	0.251	0.293	0.363
2015	0.208	0.269	0.320	0.380
2016	0.217	0.285	0.334	0.391
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.158	0.197	0.228	0.274
2013	0.170	0.208	0.240	0.280
2014	0.179	0.219	0.258	0.308
2015	0.192	0.237	0.271	0.313
2016	0.204	0.257	0.288	0.332
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.095	0.127	0.163	0.240
2013	0.101	0.139	0.174	0.250
2014	0.111	0.153	0.197	0.272
2015	0.126	0.171	0.213	0.285
2016	0.134	0.182	0.234	0.307

Notes: This table presents the mean full-time employment rates of the HUD-assisted, work-able population for MSAs and nonmetropolitan balances of each state in the given quartile of Indicator 3. The MSA-level employment rates for the HUD-assisted population are the numerators used to calculate Indicator 3. Quartile-level mean estimates of full-time employment rates are weighted by the number of households served by the HUD program in each MSA or nonmetropolitan balance of state in that quartile.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit B-4 | Mean Full-Time Employment Rate of the Overall MSA Population (Denominator of Indicator 3) by Quartile of MSA-Level Estimates of Indicator 3

Across All Three HUD Programs				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.519	0.533	0.533	0.542
2013	0.511	0.529	0.529	0.533
2014	0.521	0.526	0.533	0.530
2015	0.529	0.539	0.535	0.536
2016	0.538	0.547	0.545	0.541
Public Housing				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.532	0.535	0.528	0.541
2013	0.526	0.528	0.520	0.535
2014	0.532	0.530	0.519	0.536
2015	0.539	0.534	0.531	0.541
2016	0.546	0.545	0.538	0.545
Housing Choice Voucher				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.515	0.529	0.537	0.538
2013	0.513	0.524	0.532	0.526
2014	0.513	0.527	0.532	0.527
2015	0.520	0.531	0.542	0.532
2016	0.534	0.548	0.545	0.536
Multifamily				
	First Quartile (Lowest)	Second Quartile	Third Quartile	Fourth Quartile (Highest)
2012	0.534	0.535	0.527	0.536
2013	0.527	0.530	0.524	0.529
2014	0.525	0.538	0.527	0.530
2015	0.536	0.543	0.531	0.536
2016	0.544	0.549	0.544	0.543

Notes: This table presents the mean full-time employment rates of the overall, work-able population for MSAs and nonmetropolitan balances of each state in the given quartile of Indicator 3. The MSA-level employment rates for the overall population are the numerators used to calculate Indicator 3. Quartile-level mean estimates of full-time employment rates are weighted by the number of households served by the HUD program in each MSA in that quartile.

Sources: American Community Survey (ACS) 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

APPENDIX C—INDICATOR ESTIMATES FOR NONMETROPOLITAN BALANCES OF STATES, BY YEAR

Exhibit C-1 | Estimates of Indicator 1 for Nonmetropolitan Balances of States, 2012 Through 2016

Indicator 1 for Nonmetropolitan Balances of States										
	2016		2015		2014		2013		2012	
1	Louisiana	0.753	Louisiana	0.759	Louisiana	0.760	Louisiana	0.746	Louisiana	0.706
2	Texas	0.703	Texas	0.726	Texas	0.717	Texas	0.704	Texas	0.681
3	Georgia	0.697	Georgia	0.683	Nebraska	0.709	Nebraska	0.686	Nebraska	0.669
4	Florida	0.689	Nebraska	0.683	Kansas	0.674	Kansas	0.651	North Dakota	0.652
5	Hawaii	0.672	Hawaii	0.674	Georgia	0.669	Georgia	0.645	Kansas	0.629
6	Nebraska	0.663	Arizona	0.673	Florida	0.657	North Dakota	0.644	Georgia	0.621
7	Arizona	0.657	Florida	0.672	Hawaii	0.655	South Dakota	0.643	Utah	0.620
8	Alabama	0.650	Kansas	0.660	Maryland	0.648	Maryland	0.641	Wyoming	0.612
9	Kansas	0.649	Alabama	0.650	Wyoming	0.636	Wyoming	0.639	Hawaii	0.610
10	New Mexico	0.646	Wyoming	0.646	Connecticut	0.635	Arizona	0.632	Connecticut	0.609
11	Maryland	0.641	South Carolina	0.639	Michigan	0.632	New Mexico	0.629	Michigan	0.609
12	South Carolina	0.632	Maryland	0.634	Illinois	0.631	Hawaii	0.626	Illinois	0.606
13	Alaska	0.631	North Dakota	0.632	Alabama	0.629	Illinois	0.625	New Mexico	0.599
14	Michigan	0.627	New Mexico	0.630	Minnesota	0.623	Florida	0.624	Florida	0.596
15	South Dakota	0.618	Illinois	0.629	South Carolina	0.620	Minnesota	0.616	Oklahoma	0.587
16	Missouri	0.614	South Dakota	0.624	Arizona	0.612	Michigan	0.613	Alabama	0.587
17	Illinois	0.612	Michigan	0.622	South Dakota	0.608	Utah	0.611	Minnesota	0.586
18	Minnesota	0.611	Minnesota	0.619	Missouri	0.607	Alabama	0.611	South Dakota	0.585
19	Connecticut	0.609	Missouri	0.613	New Mexico	0.607	Oklahoma	0.599	Idaho	0.573
20	Idaho	0.606	Arkansas	0.609	Oklahoma	0.604	South Carolina	0.597	Maryland	0.572
21	Arkansas	0.604	North Carolina	0.604	Arkansas	0.603	Wisconsin	0.585	New York	0.568
22	North Carolina	0.602	Wisconsin	0.604	Wisconsin	0.602	Montana	0.584	Wisconsin	0.566
23	Wisconsin	0.597	New Hampshire	0.599	North Dakota	0.601	Alaska	0.580	South Carolina	0.557
24	Mississippi	0.596	New York	0.597	North Carolina	0.589	Arkansas	0.580	New Hampshire	0.556
25	Wyoming	0.596	Alaska	0.597	New Hampshire	0.585	New York	0.574	Alaska	0.555

Indicator 1 for Nonmetropolitan Balances of States										
	2016		2015		2014		2013		2012	
26	North Dakota	0.586	Mississippi	0.593	<i>Alaska</i>	0.582	Missouri	0.572	Montana	0.554
27	New York	0.586	Colorado	0.589	New York	0.579	Connecticut	0.570	North Carolina	0.549
28	<i>New Hampshire</i>	0.583	Oklahoma	0.587	Iowa	0.578	Idaho	0.566	Mississippi	0.548
29	California	0.582	Iowa	0.582	Idaho	0.576	North Carolina	0.565	Iowa	0.548
30	Colorado	0.579	Connecticut	0.578	Colorado	0.570	Colorado	0.564	Arkansas	0.547
31	Oklahoma	0.576	Montana	0.570	Montana	0.569	<i>New Hampshire</i>	0.564	Missouri	0.546
32	Washington	0.569	Washington	0.569	California	0.568	Iowa	0.561	Colorado	0.545
33	Montana	0.559	Utah	0.567	Mississippi	0.566	Mississippi	0.560	Washington	0.528
34	Iowa	0.556	California	0.563	Washington	0.564	California	0.556	Pennsylvania	0.516
35	Tennessee	0.552	Idaho	0.555	Utah	0.563	Washington	0.541	California	0.511
36	Vermont	0.551	Tennessee	0.541	Tennessee	0.540	Pennsylvania	0.539	Arizona	0.505
37	Utah	0.548	Oregon	0.537	Oregon	0.534	Tennessee	0.516	Indiana	0.496
38	Oregon	0.544	Indiana	0.532	Pennsylvania	0.526	Indiana	0.511	Tennessee	0.492
39	<i>Massachusetts</i>	0.527	Vermont	0.527	Indiana	0.522	Kentucky	0.503	Kentucky	0.489
40	Pennsylvania	0.526	Pennsylvania	0.520	Kentucky	0.513	Oregon	0.495	Oregon	0.478
41	Indiana	0.516	Virginia	0.513	Virginia	0.505	Nevada	0.495	Nevada	0.476
42	Virginia	0.506	Kentucky	0.509	Vermont	0.499	Vermont	0.484	Virginia	0.466
43	Kentucky	0.501	<i>Massachusetts</i>	0.498	West Virginia	0.482	West Virginia	0.479	West Virginia	0.464
44	West Virginia	0.471	West Virginia	0.494	Ohio	0.463	<i>Massachusetts</i>	0.477	<i>Massachusetts</i>	0.458
45	Ohio	0.461	Ohio	0.469	<i>Massachusetts</i>	0.461	Virginia	0.476	Vermont	0.454
46	Nevada	0.443	Nevada	0.447	Nevada	0.449	Ohio	0.452	Ohio	0.429
47	Maine	0.435	Maine	0.441	Maine	0.432	Maine	0.410	Maine	0.390

Notes: The general population employment rate is calculated by dividing the employed, nondisabled population by the total nondisabled population. This ratio reflects nondisabled, noninstitutionalized civilian populations ages 18 through 64. The Census Bureau classifies respondents as “Employed” if they are either “at work” or “with a job but not at work” during the reference week. Further clarification on employment and disability status can be found at the following link: https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSsubjectDefinitions.pdf.

The employment rate for individuals participating in HUD programs is calculated by dividing the employed, work-able population by the overall work-able population across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages 18 through 64; individuals are considered employed if their wage income was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, Public Housing Authority (PHA) wages, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by Moving to Work (MTW) PHAs.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit C-2 | Estimates of Indicator 2 for Nonmetropolitan Balances of States, 2012 Through 2016

Indicator 2 for Nonmetropolitan Balances of States										
	2016 (%)		2015 (%)		2014 (%)		2013 (%)		2012 (%)	
1	Hawaii	53.9	Nebraska	52.9	Nebraska	51.9	Nebraska	50.4	Nebraska	47.4
2	Nebraska	52.6	Hawaii	50.5	Hawaii	49.6	Hawaii	46.9	Kansas	45.4
3	Kansas	47.3	Kansas	46.9	Kansas	46.4	Kansas	45.5	Hawaii	44.9
4	New Hampshire	46.4	New Hampshire	46.4	North Dakota	46.1	North Dakota	43.9	North Dakota	44.8
5	Connecticut	45.2	Louisiana	45.4	New Hampshire	44.9	Texas	43.4	Texas	42.8
6	Minnesota	44.8	Minnesota	44.8	Texas	43.6	New Hampshire	42.5	Minnesota	40.7
7	Texas	44.6	Texas	44.6	Louisiana	43.4	Connecticut	42.2	New Hampshire	40.7
8	Wyoming	44.6	North Dakota	44.5	Minnesota	42.7	Louisiana	42.0	Louisiana	40.6
9	Louisiana	43.7	Wyoming	43.4	Connecticut	42.2	South Dakota	41.1	Maryland	39.8
10	Alaska	43.3	Maryland	43.3	Maryland	41.8	Minnesota	40.7	New York	39.6
11	South Dakota	42.5	South Dakota	43.0	South Dakota	41.2	Maryland	40.0	Wyoming	38.7
12	Maryland	42.0	Utah	40.8	Wisconsin	39.5	Wyoming	39.8	South Dakota	38.4
13	North Dakota	41.9	Wisconsin	40.4	Wyoming	38.8	New York	39.5	Illinois	38.2
14	Wisconsin	41.6	Florida	39.9	New York	38.6	Illinois	38.5	Connecticut	38.0
15	Florida	41.5	Alaska	39.7	Illinois	38.5	Iowa	36.6	Wisconsin	37.4
16	Illinois	40.1	Connecticut	39.2	Utah	38.0	Wisconsin	36.4	Colorado	37.0
17	New York	39.9	Arizona	39.0	Florida	37.9	Oklahoma	36.3	Florida	35.8
18	Iowa	39.4	Illinois	38.9	Iowa	37.6	Colorado	36.2	Michigan	35.4
19	Arizona	39.4	Colorado	38.6	Colorado	37.2	Michigan	36.2	Iowa	35.1
20	Georgia	38.4	Missouri	38.6	Idaho	37.1	Missouri	36.0	Alaska	35.0
21	Missouri	38.4	New York	38.4	Michigan	37.1	Florida	35.9	Oklahoma	34.5
22	Michigan	38.3	Iowa	37.6	Missouri	36.9	Alaska	35.2	New Mexico	34.3
23	Colorado	38.1	Michigan	37.3	Georgia	35.9	New Mexico	35.1	Georgia	34.0
24	Massachusetts	38.0	Georgia	36.7	New Mexico	35.4	Georgia	34.8	Missouri	33.6
25	New Mexico	37.1	New Mexico	36.5	Oklahoma	35.1	Pennsylvania	34.7	Pennsylvania	33.5
26	Washington	35.9	Massachusetts	36.3	Arizona	34.6	Montana	34.2	Nevada	33.3
27	Vermont	35.7	Oklahoma	35.4	Alaska	34.4	Alabama	33.4	California	33.0
28	California	35.7	Montana	35.2	Alabama	34.0	Idaho	32.6	Alabama	33.0
29	Alabama	35.5	Vermont	35.1	Pennsylvania	33.9	Washington	32.3	Montana	32.8
30	Arkansas	35.4	California	35.0	Washington	32.9	Utah	32.1	Idaho	32.8

Indicator 2 for Nonmetropolitan Balances of States										
	2016 (%)		2015 (%)		2014 (%)		2013 (%)		2012 (%)	
31	Idaho	35.1	Alabama	34.6	Montana	32.8	Arkansas	32.1	Washington	32.2
32	Utah	34.1	Idaho	34.4	Massachusetts	32.7	Vermont	32.1	Massachusetts	31.4
33	Montana	34.0	Arkansas	34.0	Arkansas	32.6	Massachusetts	31.4	Utah	31.4
34	Oklahoma	33.5	Washington	33.7	California	32.5	California	31.0	Vermont	31.2
35	Pennsylvania	33.3	Pennsylvania	32.9	Vermont	32.2	Mississippi	30.8	Mississippi	31.0
36	Oregon	32.9	North Carolina	31.4	North Carolina	30.8	Nevada	30.6	Arkansas	30.7
37	North Carolina	32.2	Indiana	31.1	Tennessee	30.2	Arizona	30.2	North Carolina	29.9
38	Mississippi	31.8	Oregon	30.8	Mississippi	30.2	North Carolina	29.3	Arizona	28.5
39	Indiana	31.7	South Carolina	30.8	Oregon	29.9	South Carolina	29.0	Oregon	28.3
40	South Carolina	31.6	Tennessee	30.8	Nevada	29.7	Oregon	28.9	Kentucky	28.3
41	Tennessee	31.6	Mississippi	30.4	Indiana	29.7	Indiana	28.7	South Carolina	27.8
42	Kentucky	29.7	Nevada	29.4	South Carolina	29.4	Kentucky	27.9	Indiana	27.6
43	Virginia	29.6	Virginia	29.4	Virginia	28.7	Tennessee	27.6	Virginia	27.0
44	Nevada	29.5	Kentucky	29.4	Kentucky	28.3	Virginia	27.6	West Virginia	26.6
45	Ohio	27.8	Ohio	27.2	Ohio	26.6	West Virginia	26.0	Tennessee	25.6
46	West Virginia	27.6	West Virginia	27.0	West Virginia	26.2	Ohio	25.8	Ohio	24.9
47	Maine	26.6	Maine	26.2	Maine	24.1	Maine	23.4	Maine	22.1

Notes: The employment rate for HUD program households is calculated by dividing the employed, work-able households by the overall work-able households across all three HUD programs and within each program. Households are considered work-able if any member is nondisabled and ages 18 through 64; households are considered employed if the total wage income in the work-able household was at least \$500 in the given year (\$500 is just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Household total wage income is derived from business income, federal wages, PHA wages, military pay, and other wage income. Further clarification on HUD's reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit C-3 | Estimates of Indicator 3 for Nonmetropolitan Balances of States, 2012 Through 2016

Indicator 3 for Nonmetropolitan Balances of States										
	2016		2015		2014		2013		2012	
1	<i>Alaska</i>	0.746	<i>Alaska</i>	0.682	<i>Alaska</i>	0.632	<i>Alaska</i>	0.689	<i>Alaska</i>	0.689
2	Hawaii	0.630	Hawaii	0.614	Maryland	0.572	Maryland	0.545	Connecticut	0.564
3	Maryland	0.615	Maryland	0.588	Hawaii	0.556	Hawaii	0.529	Hawaii	0.492
4	Florida	0.581	<i>New Hampshire</i>	0.580	Connecticut	0.553	Louisiana	0.518	Louisiana	0.487
5	<i>New Hampshire</i>	0.578	Connecticut	0.558	Nebraska	0.541	Connecticut	0.509	Nebraska	0.482
6	Connecticut	0.569	Nebraska	0.547	Louisiana	0.528	<i>New Hampshire</i>	0.505	North Dakota	0.467
7	Washington	0.545	Florida	0.535	<i>New Hampshire</i>	0.525	North Dakota	0.504	Maryland	0.461
8	Nebraska	0.544	Wyoming	0.530	Wyoming	0.514	Wyoming	0.485	<i>New Hampshire</i>	0.457
9	Minnesota	0.540	Minnesota	0.523	Texas	0.506	Nebraska	0.480	Wyoming	0.448
10	<i>Massachusetts</i>	0.531	Louisiana	0.523	Florida	0.501	Texas	0.476	Texas	0.444
11	Louisiana	0.515	Colorado	0.511	Kansas	0.495	Florida	0.456	Illinois	0.424
12	Vermont	0.514	North Dakota	0.510	Washington	0.488	Minnesota	0.456	Florida	0.424
13	California	0.509	Texas	0.507	North Dakota	0.482	Washington	0.453	Alabama	0.417
14	Arizona	0.506	Kansas	0.507	Minnesota	0.480	Illinois	0.450	Montana	0.417
15	Colorado	0.503	Washington	0.505	California	0.464	Alabama	0.449	Washington	0.415
16	Alabama	0.499	South Dakota	0.499	Vermont	0.460	South Dakota	0.447	New York	0.412
17	Oregon	0.494	Vermont	0.491	Alabama	0.456	Kansas	0.445	Nevada	0.410
18	New York	0.490	Alabama	0.490	Colorado	0.454	Montana	0.441	Kansas	0.408
19	South Dakota	0.487	New York	0.485	Illinois	0.454	California	0.434	Minnesota	0.403
20	Texas	0.485	California	0.483	New York	0.450	Vermont	0.432	Colorado	0.401
21	Kansas	0.481	<i>Massachusetts</i>	0.478	South Dakota	0.443	Colorado	0.431	Oklahoma	0.393
22	Georgia	0.475	Oregon	0.477	Oklahoma	0.439	New Mexico	0.424	<i>Massachusetts</i>	0.391
23	North Dakota	0.473	Arizona	0.473	Montana	0.434	Oklahoma	0.421	New Mexico	0.387
24	Michigan	0.460	Montana	0.468	Oregon	0.430	New York	0.418	Vermont	0.385
25	Montana	0.453	Illinois	0.456	Wisconsin	0.422	Nevada	0.412	South Dakota	0.384
26	South Carolina	0.453	New Mexico	0.454	<i>Massachusetts</i>	0.419	Arizona	0.410	California	0.380
27	Wisconsin	0.447	Georgia	0.446	New Mexico	0.414	<i>Massachusetts</i>	0.400	Wisconsin	0.372
28	Illinois	0.446	Michigan	0.446	Georgia	0.408	Wisconsin	0.399	Georgia	0.366
29	Wyoming	0.441	South Carolina	0.439	Missouri	0.408	Oregon	0.386	Utah	0.347
30	New Mexico	0.438	Wisconsin	0.439	Arizona	0.408	Georgia	0.383	Mississippi	0.346

Indicator 3 for Nonmetropolitan Balances of States										
	2016		2015		2014		2013		2012	
31	Arkansas	0.415	Oklahoma	0.428	Michigan	0.403	South Carolina	0.373	Missouri	0.345
32	Missouri	0.414	Missouri	0.419	South Carolina	0.397	Missouri	0.370	Oregon	0.341
33	Mississippi	0.407	Mississippi	0.412	Arkansas	0.389	Arkansas	0.367	Iowa	0.341
34	Iowa	0.405	Iowa	0.406	Nevada	0.387	Iowa	0.361	Arkansas	0.339
35	Idaho	0.405	Arkansas	0.401	North Carolina	0.379	Michigan	0.359	Michigan	0.337
36	North Carolina	0.401	North Carolina	0.400	Utah	0.372	Mississippi	0.357	North Carolina	0.335
37	Tennessee	0.401	Tennessee	0.377	Iowa	0.368	North Carolina	0.349	Pennsylvania	0.332
38	Oklahoma	0.398	Idaho	0.373	Mississippi	0.367	Pennsylvania	0.348	South Carolina	0.331
39	Nevada	0.390	Pennsylvania	0.358	Tennessee	0.363	Tennessee	0.341	Idaho	0.312
40	Pennsylvania	0.369	Nevada	0.345	Pennsylvania	0.344	Utah	0.340	Tennessee	0.303
41	Maine	0.364	Kentucky	0.339	Kentucky	0.326	Kentucky	0.311	Kentucky	0.302
42	Indiana	0.342	Indiana	0.334	Indiana	0.325	Idaho	0.307	Maine	0.275
43	Kentucky	0.332	Ohio	0.328	Maine	0.313	Indiana	0.302	Indiana	0.275
44	Ohio	0.330	Maine	0.321	Idaho	0.312	Maine	0.297	Arizona	0.274
45	Utah	0.323	Virginia	0.320	Ohio	0.300	Ohio	0.282	West Virginia	0.264
46	Virginia	0.320	West Virginia	0.303	Virginia	0.294	Virginia	0.267	Virginia	0.262
47	West Virginia	0.311	Utah	0.303	West Virginia	0.271	West Virginia	0.261	Ohio	0.256

Notes: The general population full-time employment rate is calculated by dividing the full-time, year-round employed nondisabled population number by the total nondisabled population number. This ratio reflects nondisabled, noninstitutionalized civilian populations ages 18 through 64. The Census Bureau classifies respondents as “Employed” if they are either at work or with a job but not at work during the reference week. “Full-time, year-round” is defined as persons who usually worked 35 hours or more per week for 50 to 52 weeks in the past 12 months. Further clarification on employment and disability status can be found at the following link:

https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf.

The employment rate for individuals participating in HUD programs is calculated by dividing the population with full-time employment status number by the overall work-able population number across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages 18 through 64; individuals are considered full-time if their wage income was at least \$12,500 in the given year (\$12,500 represents the wage income of just under 35 hours of work for at least 50 weeks per year at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, PHA wages, and other wage income. Further clarification on HUD’s reported wage income can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: ACS 5-year estimates; HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

Exhibit C-4 | Estimates of Indicator 4 for Nonmetropolitan Balances of States, 2012 Through 2016

Indicator 4 for Nonmetropolitan Balances of States										
	2016 (%)		2015 (%)		2014 (%)		2013 (%)		2012 (%)	
1	Nebraska	57.5	Nebraska	59.1	Nebraska	61.0	Nebraska	59.0	Nebraska	57.6
2	Louisiana	54.8	Texas	55.1	Connecticut	55.8	North Dakota	54.9	North Dakota	55.2
3	Connecticut	54.7	Louisiana	54.9	Kansas	55.7	Louisiana	54.4	Connecticut	54.1
4	Kansas	54.2	Kansas	54.9	Louisiana	54.7	Kansas	53.8	Texas	52.6
5	Texas	53.7	North Dakota	54.0	Texas	54.4	Texas	53.5	Kansas	52.5
6	Minnesota	52.2	Minnesota	52.7	Minnesota	52.5	South Dakota	52.8	Louisiana	52.3
7	Maryland	51.9	Wyoming	52.1	Wyoming	51.5	Wyoming	52.0	Wyoming	49.7
8	Georgia	51.8	Connecticut	51.5	Maryland	51.4	Connecticut	51.5	Minnesota	49.4
9	Hawaii	51.4	Maryland	51.4	North Dakota	51.2	Minnesota	51.3	South Dakota	48.9
10	Florida	51.1	New Hampshire	51.4	South Dakota	49.9	Maryland	50.4	Illinois	48.0
11	South Dakota	50.9	South Dakota	51.2	New Hampshire	49.9	Illinois	48.8	Maryland	47.9
12	New Hampshire	50.8	Hawaii	50.7	Hawaii	49.8	New Hampshire	48.6	New Hampshire	47.7
13	North Dakota	50.4	Georgia	50.6	Illinois	49.3	Iowa	47.7	Iowa	46.9
14	Wisconsin	49.8	Wisconsin	49.9	Wisconsin	49.2	Wisconsin	47.6	Hawaii	46.9
15	Alabama	48.6	Illinois	49.5	Georgia	49.1	Hawaii	47.4	Wisconsin	46.5
16	Illinois	48.4	Iowa	49.3	Iowa	49.0	Georgia	47.4	Georgia	46.5
17	Wyoming	48.0	Florida	49.2	Florida	47.5	Colorado	46.7	Utah	46.4
18	Alaska	47.9	Alabama	48.4	Alabama	47.3	Alabama	46.4	New York	46.1
19	Missouri	47.8	Colorado	47.7	Colorado	46.6	Utah	46.2	Colorado	46.0
20	Colorado	47.7	Missouri	47.4	Missouri	46.5	New York	45.9	Alabama	45.5
21	Iowa	47.4	New York	47.3	Michigan	46.3	Florida	45.7	Oklahoma	44.7
22	Vermont	47.2	North Carolina	46.5	New York	46.2	Oklahoma	45.2	Michigan	44.5
23	Michigan	47.1	South Carolina	46.4	Arkansas	45.6	Alaska	45.2	Florida	44.1
24	South Carolina	47.1	Michigan	46.2	Oklahoma	45.6	New Mexico	45.1	Montana	43.3
25	Idaho	46.9	Arkansas	45.9	North Carolina	45.4	Montana	44.9	New Mexico	43.3
26	North Carolina	46.7	Alaska	45.4	South Carolina	44.9	Michigan	44.6	Alaska	43.2
27	New York	46.7	Vermont	45.1	Alaska	44.7	Arkansas	44.2	North Carolina	43.1
28	Arkansas	46.0	Mississippi	44.8	Montana	43.9	Missouri	44.0	Idaho	42.8
29	New Mexico	45.6	New Mexico	44.7	New Mexico	43.4	North Carolina	43.7	Mississippi	42.5
30	Massachusetts	45.5	Oklahoma	44.6	Vermont	43.0	South Carolina	43.5	Missouri	42.4

Indicator 4 for Nonmetropolitan Balances of States										
	2016 (%)		2015 (%)		2014 (%)		2013 (%)		2012 (%)	
31	Mississippi	45.3	Arizona	44.4	Idaho	42.6	Pennsylvania	42.5	Arkansas	42.1
32	Utah	44.5	Utah	44.2	Mississippi	42.6	Arizona	42.3	Pennsylvania	41.1
33	Arizona	44.2	Montana	43.8	Washington	42.1	Mississippi	42.3	South Carolina	40.9
34	Oklahoma	43.9	Indiana	43.2	Utah	41.9	California	42.1	Massachusetts	40.7
35	California	43.5	Massachusetts	42.7	Massachusetts	41.9	Idaho	42.0	Vermont	40.1
36	Montana	43.3	Idaho	42.2	Pennsylvania	41.8	Massachusetts	41.9	Indiana	39.8
37	Washington	43.2	Washington	42.1	Indiana	41.8	Vermont	41.8	California	39.6
38	Indiana	42.7	Pennsylvania	41.4	California	41.5	Indiana	40.6	Washington	39.2
39	Pennsylvania	42.1	California	41.2	Arizona	40.3	Washington	40.5	Virginia	37.7
40	Tennessee	41.6	Virginia	40.7	Tennessee	39.9	Tennessee	38.0	Tennessee	37.1
41	Oregon	40.7	Tennessee	40.6	Virginia	39.6	Virginia	38.0	Arizona	36.3
42	Virginia	40.4	Oregon	40.2	Oregon	39.6	Oregon	36.9	Oregon	35.9
43	Ohio	37.4	Ohio	37.9	Kentucky	37.3	Kentucky	36.7	Kentucky	35.9
44	Kentucky	36.9	Kentucky	37.5	Ohio	36.6	Nevada	36.6	Nevada	35.5
45	Maine	36.0	Maine	35.4	Maine	34.7	Ohio	35.8	Ohio	34.3
46	West Virginia	33.7	West Virginia	35.0	West Virginia	34.3	West Virginia	34.2	West Virginia	33.6
47	Nevada	33.5	Nevada	32.8	Nevada	33.8	Maine	33.4	Maine	31.9

Notes: The employment rate for individuals participating in HUD programs is calculated by dividing the employed or full-time student, work-able population number by the overall work-able population number across all three HUD programs and within each program. Individuals are considered work-able if they are nondisabled and ages of 18 through 64; individuals are considered employed if their wage income was at least \$500 in the given year (\$500 represents just under 70 hours of work at the 2018 federal minimum wage of \$7.25 per hour). Wage income is derived from business income, federal wages, PHA wages, military pay, and other wage income. Individuals are reported as full-time students if they are 18 years of age or older on the effective date of action and carry a subject load deemed full-time by the standards and practices of the educational institution attended. Further clarification on HUD's definitions of wage income or full-time student status can be found in the reporting form instructional guides (HUD, 2014; HUD PIH, 2004). Values are bolded and italicized for areas served by MTW PHAs.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

APPENDIX D—LIST OF METROPOLITAN STATISTICAL AREAS SERVED BY MOVING TO WORK (MTW) PUBLIC HOUSING AUTHORITIES (PHAs)

Exhibit D-1 | List of Areas That Are Served by MTW PHAs

Metropolitan Statistical Areas (and Nonmetropolitan Balance Areas) Served by MTW PHAs	
Akron, OH	Nonmetropolitan balance, NH
Anchorage, AK	Olympia-Tumwater, WA
Atlanta-Sandy Springs-Roswell, GA	Orlando-Kissimmee-Sanford, FL
Baltimore-Columbia-Towson, MD	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD
Barnstable Town, MA	Pittsburgh, PA
Boston-Cambridge-Newton, MA-NH	Pittsfield, MA
Boulder, CO	Portland-Vancouver-Hillsboro, OR-WA
Champaign-Urbana, IL	Providence-Warwick, RI-MA
Charlotte-Concord-Gastonia, NC-SC	Reno, NV
Chicago-Naperville-Elgin, IL-IN-WI	Riverside-San Bernardino-Ontario, CA
Columbus, GA-AL	Salisbury, MD-DE
Dover, DE	San Antonio-New Braunfels, TX
Fairbanks, AK	San Diego-Carlsbad, CA
Lawrence, KS	San Francisco-Oakland-Hayward, CA
Lexington-Fayette, KY	San Jose-Sunnyvale-Santa Clara, CA
Lincoln, NE	Seattle-Tacoma-Bellevue, WA
Louisville/Jefferson County, KY-IN	Springfield, MA
Minneapolis-St. Paul-Bloomington, MN-WI	Visalia-Porterville, CA
New Haven-Milford, CT	Washington-Arlington-Alexandria, DC-VA-MD-WV
Nonmetropolitan balance, AK	Worcester, MA-CT
Nonmetropolitan balance, MA	

Exhibit D-2 | HUD-Assisted Households by Work-Able and MTW Status for Indicator 3

	HUD-Assisted Households	HUD-Assisted, Work-Able Households	HUD-Assisted, Work-Able Households ^a			HUD-Assisted MTW Work-Able Households		
			1 Year	2 Years	3 Years	1 Year	2 Years	3 Years
2012	4,467,738	2,328,502	398,395	404,842	1,525,265	38,260	75,262	99,324
2013	4,425,166	2,296,688	325,713	392,453	1,578,522	26,809	54,766	125,191
2014	4,455,338	2,300,748	354,778	325,439	1,620,531	28,295	41,774	151,125
2015	4,494,405	2,306,481	375,170	330,846	1,600,465	32,683	36,690	156,813
2016	4,498,112	2,291,047	359,561	339,387	1,592,099	29,040	31,090	164,921

^a Households that appear in the year noted and have income information for 1, 2, or 3 previous years.

Approximately 66 percent of the households have data for all 3 years.

Sources: HUD IMS/PIC and TRACS data from HUD longitudinal tenant data files

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