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Analysis of Models for Assessing Rental Assistance Need



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As job losses mounted during the pandemic, researchers from academic institutions, financial firms, and advocacy organizations published estimates of the need for rental assistance due to the economic slowdown. Early estimates were largely designed to provide policymakers with a rough estimate of the number of renters who would be financially affected by stay-at-home orders. Over time, these estimates have become more detailed and nuanced, incorporating new data on the pandemic’s economic effects and the wide range of policy interventions designed to offset those effects.

In this analysis, we present a discussion of nine estimates of rental debt that were published at different times during the pandemic, and we compare those estimates to the congressional appropriations and allocations for the Emergency Rental Assistance Programs, ERA1 and ERA2. This review has two main goals: (a) to identify models or components of models that best estimate the need for rental assistance during an emergency such as the COVID-19 pandemic and (b) to identify models that can be helpful in allocating emergency rental assistance across states and, if possible, within states as well.

We chose these models (Table 1) because they have been widely cited in the media and because they provide comparable national-level estimates of total rental assistance needs. Other models, such as those published by the Federal Bank of Boston and the NYU Furman Center, provide only state or regional estimates and therefore were excluded from this review.

TABLE 1: MODELS USED FOR ESTIMATING RENTAL DEBT

Model	Publication Date	National Estimate of Rental Debt ^a
Harvard Joint Center for Housing	Apr. 2020	\$274 million per month
National Low Income Housing Coalition	May 2020	\$7.1 billion per month
Urban Institute	June 2020	\$1.8 billion per month
National Council of State Housing Agencies	Sept. 2020	\$25.1 – \$34.3 billion total debt as of Jan. 2021
Moody’s Analytics	Jan. 2021	\$34 billion total debt as of Feb. 2021
PolicyLink/National Equity Atlas	July 2021 ^b	\$20 billion total debt as of July 2021
Mortgage Bankers Association	May 2021 ^b	\$35 billion total debt as of Mar. 2021
Federal Reserve Bank of Philadelphia	July 2021 ^b	\$15.3 billion total debt as of Aug. 2021
Surgo Ventures	July 2021	\$23 billion total debt as of July 2021

Note: Some models project a per-month figure, whereas others project a cumulative figure as of a certain date.

a. Where models include multiple scenarios, these figures reflect the most conservative estimate.

b. These models have been updated throughout the pandemic; these figures reflect the most recent estimates.

Although some estimates are more sophisticated than others, it is important to note that they all have limitations. In particular, these estimates reflect economic conditions at a single point in time, but the pandemic’s impacts on employment and financial markets have shifted dramatically over the past 18 months. The policy environment also has continued to change as local, state, and federal officials launch new programs and policies, or end temporary ones, in response to the pandemic.

The models take different approaches and use different data sources to estimate need, but they also share some common elements. In the following sections, we discuss the data sources used to produce the estimates and the ways in which the models address two key questions about the needs of renter households.

Data sources for estimates of renter need

The models reviewed here incorporate data collected by federal agencies, financial services firms, and nonprofit organizations. Depending on each model’s goals and approach, the data indicators used may include rental costs, household income, unemployment rates, and the number of households with rental debt or facing eviction. Table 2 shows the data sources and indicators used in each model.

TABLE 2: DATA SOURCES AND INDICATORS USED, BY MODEL

Model					
	American Community Survey (Census Bureau)	Household Pulse Survey (Census Bureau)	Current Employment Statistics (Bureau of Labor Statistics)	Understanding America Study (University of Southern California)	Other sources used
Harvard Joint Center for Housing Studies	Rental costs, income, occupation				
Urban Institute	Rental costs		Unemployment		
National Low Income Housing Coalition					Pew Research American Trends Panel ; Congressional Budget Office
Federal Reserve Bank of Philadelphia	Rental costs, income	Unemployment insurance (UI) reciprocity	Unemployment		Mongey et al. 2020 ; Ganong et al. 2020 ; Census/Bureau of Labor Statistics Current Population Survey
PolicyLink/National Equity Atlas	Rental costs, income	Behind on rent		Behind on rent	
Moody’s Analytics		Behind on rent			Moody’s Analytics Jan. 2021 baseline economic outlook; Equifax; Census Housing Vacancy Survey ; Bureau of Labor Statistics Consumer Expenditure Survey
Mortgage Bankers Association				Behind on rent	
National Council of State Housing Agencies		Behind on rent			
Surgo Ventures	Rental costs, income, (predicted) unemployment, demographics	Behind on rent			

One of the central challenges of estimating the overall need for rental assistance has been the lack of robust data regarding the pandemic's economic impact on renter households. Emergency programs must respond to changing conditions in real time, but there is often a trade-off between timeliness and the reliability of available data. The strongest models recognize those limitations and incorporate information from different data sources, both established and novel, to estimate conditions during the pandemic. The following is a brief description of the limitations of the most frequently used data sources.

- [American Community Survey \(ACS\)](#): The ACS is a nationally representative, mandatory survey administered by the Census Bureau every year. The models reviewed in this discussion use ACS one-year or five-year estimates to determine the number of renters per state, renters' household financial characteristics (i.e., incomes, rent, and cost burden), and in some cases, renters' expected likelihood of job loss based on the industry they work in or their type of employment. Although the ACS is the most comprehensive household-level data source available and has a high degree of accuracy, it has a significant time lag; data for calendar year 2020 were not released until September 2021 (ACS data included in the nine models were collected before the pandemic began).
- [Bureau of Labor Statistics Current Employment Statistics \(CES\)](#): The CES is a monthly survey of businesses throughout the country that captures information on the number of employees on payroll and their wages and hours, categorized by industry and geography. Typically, models use the CES to assess the likelihood of job loss by linking unemployment rates from the CES to renters' employment characteristics from other sources. Key limitations of the CES are that it neither differentiates between full- and part-time workers nor reflects the number of people who may have had their hours reduced without being laid off.
- [Census Household Pulse Survey \(Pulse\)](#): This experimental survey was launched in March 2020 to collect timely data during the pandemic. It is a voluntary survey sent to a random sample of American households on a biweekly basis. Most relevantly, it asks respondents (a) if they are caught up on rent payments and (b) how confident they are they will be able to pay next month's rent. Although the survey offers timely data on the financial challenges households are facing, it does not capture the amount of rental arrears. Additionally, respondents' reported confidence in their ability to pay rent is only a moderate proxy for actual rent payments,¹ and the survey results have large margins of error.
- [Understanding America Study \(UAS\)](#): This longitudinal survey, led by the University of Southern California, collects social and economic data from a nationally representative sample of households. At the outset of the pandemic, the study added an additional survey to collect data on COVID-19-related experiences. Respondents are asked if they have faced an eviction previously, if they have rent in arrears, and if they are facing eviction now. Because the UAS is a longitudinal survey, it can capture changes over time, such as the number of months a household has been

¹ Jeff Larrimore and Erin Troland, [Improving Housing Payment Projections During the COVID-19 Pandemic](#). Washington, DC: Federal Reserve, October 2020.

unable to pay rent. One of the UAS's limitations is that it provides data at the national level and provides more granular estimates only for a small subset of states and localities (California, New York, Washington, and Florida and Los Angeles County).

How models estimate total renter need

Each of the models we reviewed addresses two questions, with varying degrees of detail:

1. How many renter households will need assistance?
2. How much assistance will renter households need to maintain housing stability?

Next, we describe how each model answers these questions, identify the assumptions each model makes, and discuss limitations and other factors that may limit the accuracy of each model's estimates.

How many renter households will need assistance?

Defining the population of renters who will be eligible for assistance is a key step in developing an estimate of overall rental assistance needs. Models generally address this question in one of two ways: (a) by estimating the number of renter households facing unemployment or (b) by drawing directly from surveys that capture the number of households with rent in arrears.

It is important to emphasize that these two approaches represent very different goals for rental assistance programs. The first approach attempts to estimate the number of renters who have lost income because of the pandemic. The second approach includes renters who are behind on their rent for any reason, including those who were facing financial difficulties before the pandemic. This distinction is important from a policy perspective because some funding streams, such as the first round of Emergency Rental Assistance Program funds, are available only to households who have experienced financial hardship related to COVID-19, whereas others (e.g., the second round of funding for the Emergency Rental Assistance Program, HOME, and Emergency Housing Vouchers) can be made available to any household experiencing financial hardship. Table 3 shows which approach each model uses; we describe both approaches in further detail below.

Table 3: Sources for estimates of the number of renters in need of assistance, by model

Model	Source used to determine number of unemployed renters due to pandemic	Source used to determine number of renters with arrears (regardless of cause)
Harvard Joint Center for Housing	Author's analysis of at-risk industries	
National Low Income Housing Coalition	Pew Research American Trends Panel; Congressional Budget Office	
Urban Institute	Current Employment Statistics	
National Council of State Housing Agencies		Pulse
Moody's Analytics		Pulse
PolicyLink/National Equity Atlas		Pulse, Understanding America Study
Mortgage Bankers Association		Understanding America Study
Federal Reserve Bank of Philadelphia	Current Employment Statistics	
Surgo Ventures		Pulse

Approach 1: Estimating the number of unemployed renters

In the early months of the pandemic, limited data were available on the pandemic's financial impacts on individuals and families, and early models used unemployment as a proxy for financial hardship. Those models looked at the number of renters working in each industry and then predicted how many of them would lose their jobs on the basis of expected or actual unemployment rates.

The earlier models generally assumed that any household with one or more earners in at-risk industries (such as food services, tourism and travel, and education) would lose income. Models typically used household-level data from the ACS to determine how many renter households had an earner employed in one of these at-risk industries. This method assumes a worst-case scenario where nearly all workers in specific industries lose their jobs in response to a stay-at-home order. This assumption was reasonable in the early weeks of the pandemic when many businesses immediately closed but was less reasonable later as many workplaces fully or partially reopened.

As the pandemic progressed, models began incorporating actual unemployment data from the CES. Rather than assuming that all workers would be affected, models assumed a proportion of workers within each industry would lose their jobs, based on the current unemployment rates within that industry. Although this method is more nuanced than the at-risk industries method described above, it does have limitations. Specifically, CES data do not capture workers who are still employed but have experienced a reduction in work hours; for that reason, it may underestimate the number of workers facing financial hardship. The model from the Federal Reserve Bank of Philadelphia (Philadelphia Fed) addresses this issue by incorporating data from the Current Population Survey, another survey jointly administered by the Census Bureau and the Bureau of Labor Statistics. The Current Population Survey tracks the number of workers who are working part time involuntarily (i.e., because of a reduction in work hours or inability to find full-time work).

Approach 2: Estimating the number of renter households in arrears

A number of surveys have recently been developed to collect information about households' financial experiences during the pandemic. Some models use these surveys to estimate the number of households that have rent in arrears. The Household Pulse Survey—the survey most frequently used—asks respondents if they are currently caught up on rent payments. It also includes a question about whether renters are confident in their ability to pay next month's rent; only the National Council of State Housing Agencies' model relies on this question to estimate overall risk of nonpayment. The UAS asks respondents if they have missed or delayed rent payments or paid less than the full amount of rent in the past month.

Although this approach is straightforward and provides timely data on nonpayment, both Pulse and the UAS have a few important limitations:

- Both surveys collect information on COVID-19-related financial impacts, but in practice, most models do not distinguish between households in arrears because of COVID-19 and those in arrears because of other factors.
- Relatedly, since these are new surveys, they cannot capture how many households were in arrears before the pandemic, which may be an important distinction for determining eligibility for assistance if the assistance is premised on whether households have lost income because of the pandemic.
- Both surveys capture only whether people have fallen behind on their payments, not how much they owe (the next section describes how models estimate total amount owed).
- Both surveys have large margins of error, especially at small geographic levels.

How much assistance will renter households need?

Once a model has defined the number of households in need of assistance, it must then project how much assistance each household needs to remain stably housed. To estimate the total rental debt owed per household, models generally take one of two approaches: (1) using household-level data to simulate the effect of a job loss on household income and quantify the gap between a household's actual rent and what they can reasonably afford to pay or (2) estimating the total rental debt by assuming that each household owes all (or a portion of) their rent over a given period.

Approach 1: Estimating rent payment gap

Not every household experiencing a financial hardship will necessarily fall behind on rent. In general, models that project the number of unemployed households (as previously described) further narrow their scope by estimating how many unemployed households will be unable to cover rent. This approach relies on estimating income from when the pandemic-related economic slowdown took effect and assessing whether it is sufficient to cover rent.

These models simulate how a job loss would affect household income, generally using ACS household-level data. To accurately estimate post-pandemic income for each household, they must not only incorporate a reduction in employment income but also account for other resources such as unemployment insurance and stimulus payments. Because the models were developed at different times, they incorporate different assumptions about available benefits. Table 4 summarizes how state and federal

benefits are incorporated into each model. (It is important to note that state and federal policies are continuing to change, so these assumptions may not be valid moving forward. For example, all three models incorporate federally funded unemployment insurance, but as of July 2021, more than 25 states have opted out of these supplemental benefits.)

TABLE 4: UNEMPLOYMENT, STIMULUS, AND OTHER BENEFITS TO HOUSEHOLDS INCLUDED IN EACH MODEL, AS OF AUGUST 2021

Model	Source of Income			
	State Unemployment Insurance (UI)	Federal Unemployment Insurance (UI)	Stimulus	Other
Harvard Joint Center for Housing Studies	50% wage replacement	\$600 weekly	None	
Urban Institute	50% wage replacement	\$600 weekly	None	
Federal Reserve Bank of Philadelphia^a	Wage replacement rate by state	\$600 weekly (Apr.–July 2020); \$300 weekly (Jan.–Aug. 2021)	\$1,200 in Apr. 2020; \$600 in Jan. 2021; \$1,400 in Mar. 2021	Household savings (5% of income), including excess income from UI

a. Assumes that only 50 percent of unemployed workers receive UI and that 90 percent of households receive stimulus payments.

After estimating each household’s post-pandemic income, it is possible to estimate the potential gap between the rent a household can afford to pay and the rent they owe. This gap represents the rental assistance needed to maintain housing stability. This approach is helpful for modeling the impacts of different policy interventions; for example, in many households, unemployment insurance and stimulus checks were enough to cover (or partially cover) the rent payment gap.

Generally, the models use a rent-to-income ratio as a benchmark for affordability. For example, the Urban Institute modelled two scenarios: one that estimates the resources needed to return renters to their baseline rent-to-income ratio and another that estimates the resources needed to alleviate cost burden altogether (i.e., reduce rent-to-income ratio to 30 percent or lower). However, it is important to note that households at different income levels do not necessarily have the same thresholds for falling behind on their rental payments. For example, many higher-income households can spend far more than 30 percent of their income toward rent without giving up other essentials, while low-income households may struggle to pay other bills even if their rent-to-income ratio is well below 30 percent.

The model from the Philadelphia Fed uses a slightly different approach: Rather than using a rent-to-income ratio as an affordability benchmark, it assumes each household will need to spend a fixed amount on nonhousing costs such as food, medicine, and other essentials. The rent gap is the difference between a household’s total income and savings and their combined housing and nonhousing costs. This approach accounts for the fact that higher-income households presumably have more flexibility to reduce their discretionary spending to cover rent compared to lower-income households.

Approach 2: Estimating total rent owed

As discussed above, the Pulse and UAS surveys capture only whether a respondent is behind on rent; they do not capture how much is owed. Therefore, models that rely on those surveys must estimate how much rental debt each household has accrued. Those models generally assume that all affected households have not paid (or have only partially paid) rent for a specified number of months. Table 5 describes each model's assumptions.

Table 5: Assumptions regarding nonpayment of rent, by model

Model	Duration of nonpayment	Share of rent households owe from period of nonpayment
National Low Income Housing Coalition	Not specified	100%
National Council of State Housing Agencies	Up to 4 months	50%
Moody's Analytics	Approximately 4 months	100%
PolicyLink/National Equity Atlas	Approximately 4 months	100%
Mortgage Bankers Association	Not specified	100%
Surgo Ventures	Approximately 3 months	100%

Models typically use ACS data to calculate the average monthly gross rent by geography or by other renter characteristics. To estimate the duration of unpaid rent, most models rely on longitudinal data from the first wave of Pulse or UAS, in which the same respondents were asked about the status of their rent payments in consecutive months.

As shown in Table 5, most models assume that renters will not pay any rent for a specified number of months. However, this assumption may significantly overstate total debt, because most indicators suggest that some renters pay at least part of their rent. For example, rent tracking data from the National Multifamily Housing Council indicates that many households make partial rent payments throughout the month.² In addition, data from Pulse indicate that nearly 80 percent of households who received a stimulus check used it to pay their rent or mortgage.³

Comparing models and estimates

The models described in this discussion were developed with different goals in mind. Some were designed to provide a quick, rough estimate of the number of people who might be eligible for housing assistance, while others were meant to provide a more comprehensive assessment of renters' needs. Models were also constrained by the availability of timely, reliable data on the pandemic's economic effects.

After reviewing the nine models in depth, we believe that the model developed by the Philadelphia Fed offers the most realistic estimate of total current rental assistance need at both the national and state levels. The most recent version of this model estimates a total of \$15.3 billion in rental debt nationally as of July 2021. The Philadelphia Fed model also offers state-specific estimates based on state

² National Multifamily Housing Council, [Rent Payment Tracker](#) (August 17, 2021).

³ Daniel Perez-Lopez and Charles Bee, [How are Americans using their stimulus payments?](#) (Census Bureau, June 24, 2020).

unemployment rates and unemployment insurance reciprocity rates and benefits levels, which are helpful in allocating a national pot of assistance across states. The Philadelphia Fed model also addresses some of the common limitations of the other models reviewed.

- *Part-time workers*: Four models (Harvard Joint Center for Housing Studies, National Low Income Housing Coalition, Urban Institute, Philadelphia Fed) use projected or actual unemployment rates as a proxy for financial hardship. However, the Philadelphia Fed model is the only one that accounts for part-time workers using data from the Current Population Survey. This is an important consideration given that many workplaces are still operating with restrictions on capacity or have lost business because of the pandemic, both of which lead to reduced working hours. By including both workers who lost their jobs and those who shifted to part-time work involuntarily, the model provides a more comprehensive view of the number of renters who are likely to be financially affected by the pandemic.
- *COVID-19 benefits*: Among the three models that analyze households' pre- and post-pandemic income (Harvard Joint Center for Housing Studies, Urban Institute, Philadelphia Fed), the Philadelphia Fed model includes the most comprehensive list of federal and state benefits. It accounts for state UI, federal UI enhancements (including the \$600 weekly benefit provided through the Coronavirus Aid, Relief, and Economic Security [CARES] Act through July 2020 and the \$300 weekly benefit provided through September 2021), and three rounds of stimulus payments. Importantly, the model does not assume that all households will receive these benefits; rather, it assumes that 90 percent of households will get stimulus payments and about 50 percent of unemployed workers in the United States will receive UI benefits. This estimate may be somewhat conservative, but it is aligned with recent Department of Labor estimates and previous research on UI reciprocity rates.⁴
- *Housing affordability*: As previously noted, this model does not assume that all renters should meet a specific affordability standard (i.e., 30 percent rent-to-income ratio). Instead, it compares each household's required spending (including housing and nonhousing costs) to their available resources. This is a more flexible definition of affordability that reflects the fact that higher-income households have more discretionary income than lower-income households and therefore may be able to continue paying their rent even after a loss of income.
- *Savings*: This is the only model that includes an analysis of household savings. The model assumes that renter households have savings in the amount of five percent of their annual income, which is similar to the national average. It also assumes that any income left over after paying for housing and nonhousing costs will be put toward savings and remain available to pay rent in future months. These assumptions are important considerations, given that many households experienced a net increase in income because of enhanced unemployment benefits and stimulus

⁴ As of the first quarter of 2021, the Department of Labor estimated that 56 percent of unemployed workers are enrolled in UI programs, including extended/enhanced programs. (U.S. Department of Labor, [UI Data Summary, Reciprocity Rate for All Programs, August 17, 2021.](#))

payments. Both assumptions align with national data showing that the personal savings rate increased dramatically in 2020 and 2021.⁵

The Philadelphia Fed estimates that, as of August 2021, approximately six percent of renters have fallen behind on their payments, with a total national debt of \$15.3 billion. This estimate is significantly more conservative than earlier estimates from other organizations. This is in part because of the model's narrow scope: The Philadelphia Fed's model aims to quantify only rental debt that can be attributed to pandemic-related economic impacts. In contrast, Pulse captures all households with rental debt, including those who were in debt before the pandemic. The Philadelphia Fed estimate may also be lower because its model incorporates a more comprehensive set of income inputs, including savings and stimulus payments.

⁵ U.S. Bureau of Economic Analysis, [Personal Saving Rate](#), Federal Reserve Economic Data, Sept. 1, 2021.