



THE UNIVERSITY OF ARIZONA
COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES

Southwest Institute for Research on Women



HOUSING INSECURITY INDICATORS & POTENTIAL HOMELESSNESS ESTIMATES FOR ARIZONA AND PIMA COUNTY

Updated with Week 42 Census Household Pulse
Survey Data – February 21st 2022

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INTRODUCTION

Under the current conditions, forecasting the likely number of individuals displaced from housing or at risk of homelessness nearly impossible. The economy is improving, but the rate of the recovery is fluctuating in response to the rapidly shifting dynamics of the ongoing pandemic. In addition, rental assistance continues to be distributed while other government benefits, such as the new expansion to the Child Tax Credit, have expired. In such a complex and incredibly dynamic environment predictions are difficult, but we do have a sense of the direction things are moving.

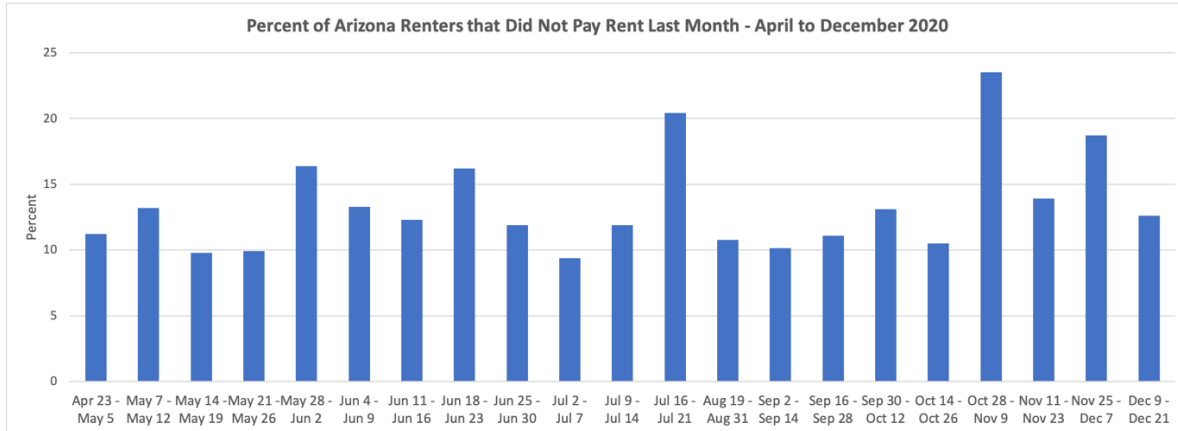
The macroeconomic situation has continued to improve steadily at both the national and state levels. There was concern that the recovery would be blunted by the explosive spread of the Omicron variant, but with Omicron case numbers receding rapidly early indications suggest that this has largely not been the case. In the previous Census Household Pulse Survey wave, conducted December 29st– January 10th, the proportion of Arizona renters not current was 12.3%. Unfortunately, in the most recent wave, conducted January 26th to February 7th 2022, this proportion not current was unchanged at 12.2%. Despite this disappointing stability in the percent of not current renters, a very positive development is that the proportion of those non-current renters who reported that they were “not likely at all” or “not very likely” to experience an eviction in the next two months grew substantially, from 40% to 59% between this wave and the last. Simultaneously, the proportion of non-current renters seeing eviction as “very likely” increased to 10.7% of non-current renters from a low of 4.7% in the last wave. Among these non-current renters, the vast majority, 71%, are only 1 or 2 months behind on their rent. Confidence in ability to pay next month’s rent among Arizona renters increased modestly. Mortgage holders are doing very well, with this survey capturing the lowest proportion of mortgage holders reporting that they are not current on payments, 3.2%, observed in this survey to date.

Overall, the news in this survey wave is mixed and captures both improvement and erosion in the financial situation of Arizonan households. A few indicators are of specific concern. Among non-current renters 12% report that they are 8 months or more behind on rent. Further, the proportion of very low income and African American households in Arizona who are not current on rent or finding it difficult to meet expenses continue to remain highly elevated relative to other groups. In addition, individuals in Arizona reporting either a lot of difficulty or no ability to walk, see, hear, or concentrate also are very disproportionately likely to report being behind on rent payments. It appears that members of historically marginalized groups (especially people living with disabilities, low incomes, or belonging to racial minorities) are not benefiting from the improving economy as quickly on average as other demographic groups.

The big, and largely unknowable, question is, how many individuals and families are going to fall through the cracks before assistance or the economic recovery reaches them? The following report compiles indicators that provide rough insight into the potential magnitude of these challenges that lie ahead.

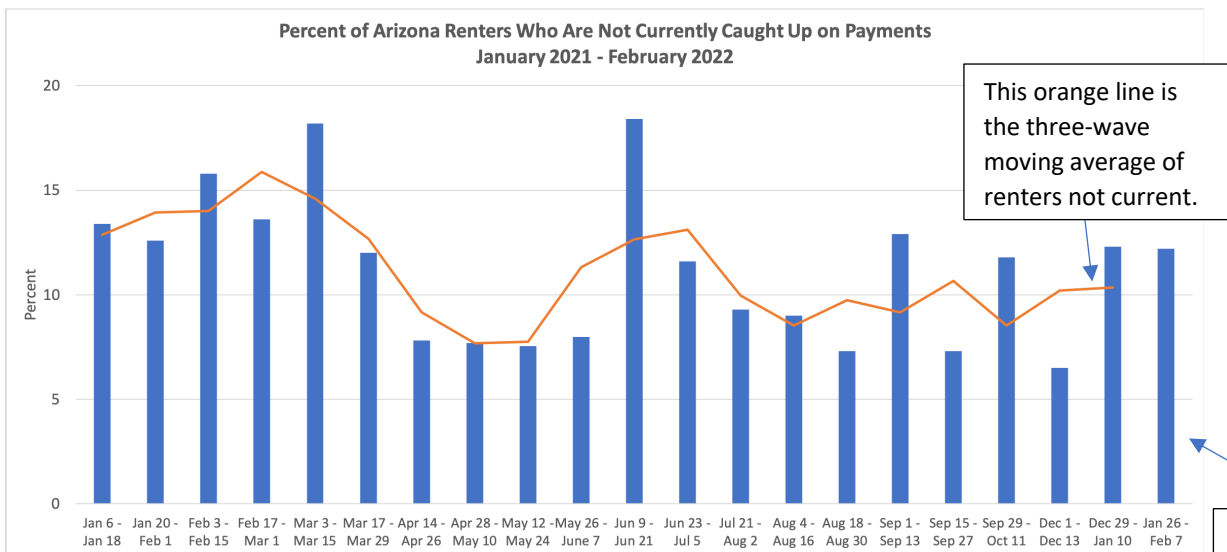


Indicators of the Scope of the Problem: Did Not Pay Rent Last Month



Source: Census Household Pulse Surveys Weeks 1-21

Indicators of the Scope of the Problem: Not Currently Caught Up On Rent

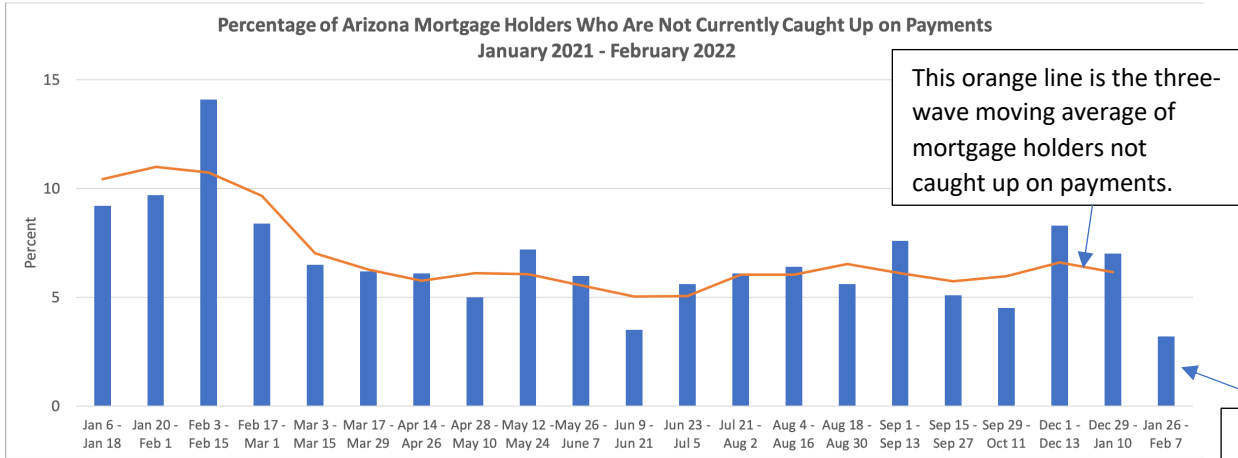


Source: Census Household Pulse Survey –Weeks 22 – 42

Unfortunately, the increase in this indicator captured in the last wave has been sustained.

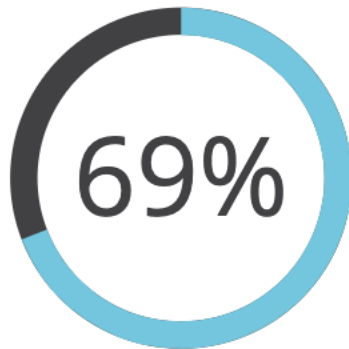


Indicators of the Scope of the Problem: Not Caught Up On Mortgage Payments



Source: Census Household Pulse Survey –Weeks 22 – 42

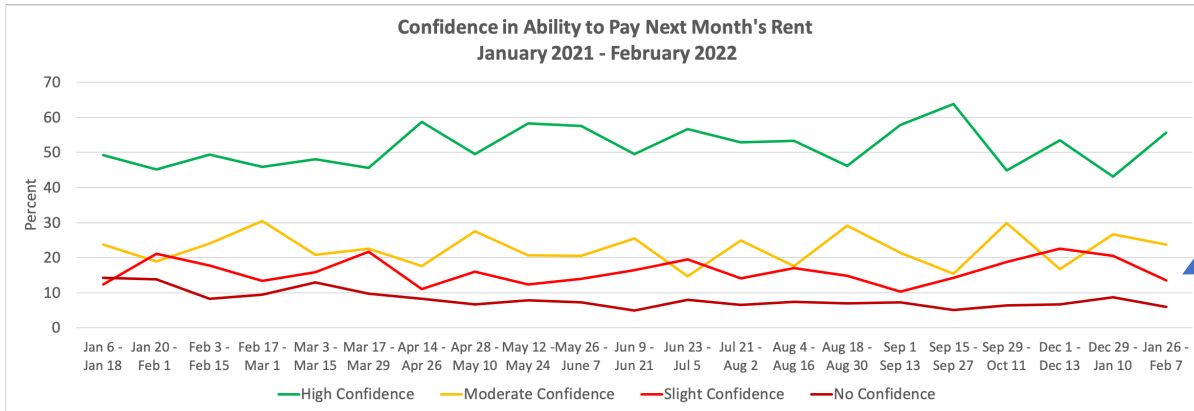
This is the lowest % of mortgage holders not current captured in this survey to date. Great news!



Homeownership Rate in Arizona in 2020

Source: U.S. Census Bureau

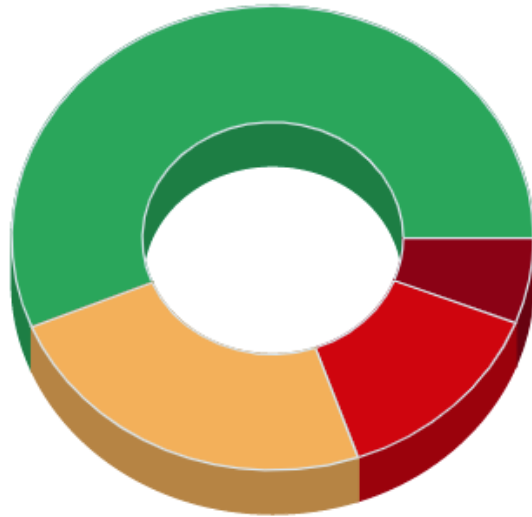
Indicators of the Scope of the Problem: Ability to Pay Next Month's Rent Arizona Renters



Modest declines in proportion with “slight” and “no confidence”. Good news.

Source: Census Household Pulse Survey –Weeks 22 - 42

Confidence in Ability to Pay Next Month's Rent Arizona Renters - Jan 26 - Feb 7 2022

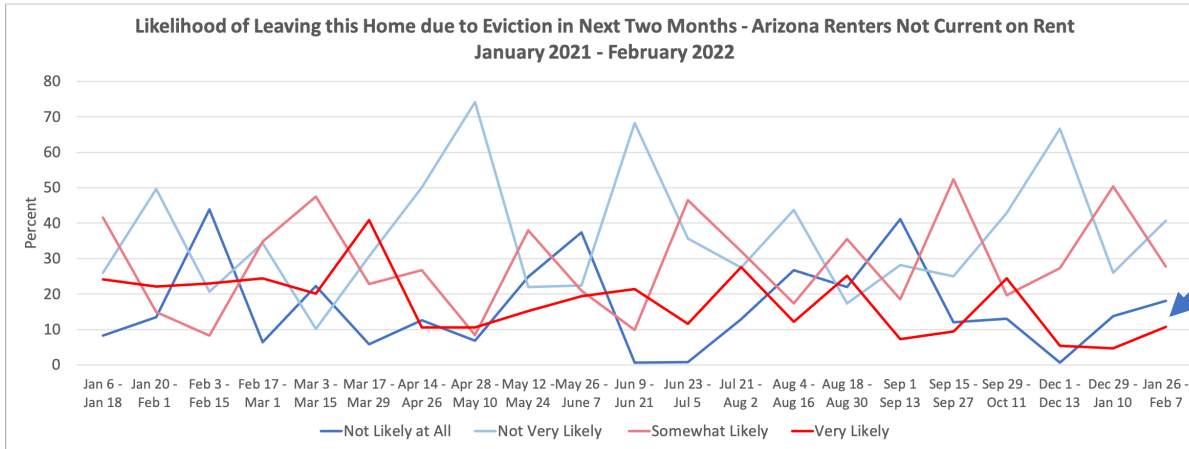


■ No Confidence 6% ■ Slight Confidence 14%
■ Moderate Confidence 24% ■ High Confidence 56%



Indicators of the Scope of the Problem: Likelihood of Leaving Due to Eviction Among Arizona Renters Not Caught Up on Rent

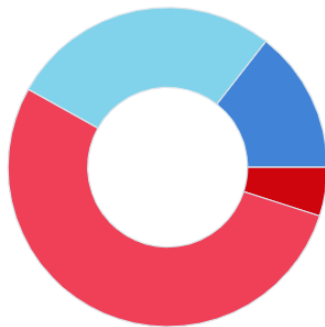
The trends in the graph below are based on questions only asked of Arizona renters not caught up on their rent: **12.2% of all AZ renter households – January 26th 2022– February 7th 2022.**



The share reporting that they view eviction as “Not at all” and “Not very” likely has grown relative to last wave. This is very good, but the proportion seeing eviction as “very likely” also increased modestly.

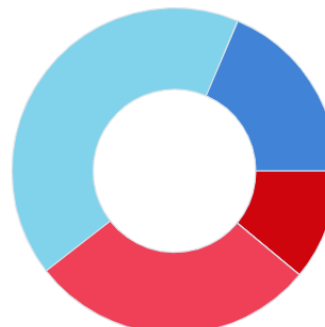
Source: Census Household Pulse Survey –Weeks 22 – 42

Likelihood of Leaving this Home due to Eviction in Next 2 Months
Arizona Renters Not Current on Rent - Dec 29, 2021- Jan 10, 2022



Very Likely 5% Somewhat Likely 50%
Not Very Likely 26% Not Likely at All 14%

Likelihood of Leaving this Home due to Eviction in Next 2 Months
Arizona Renters Not Current on Rent - Jan 26 - Feb 7 2022

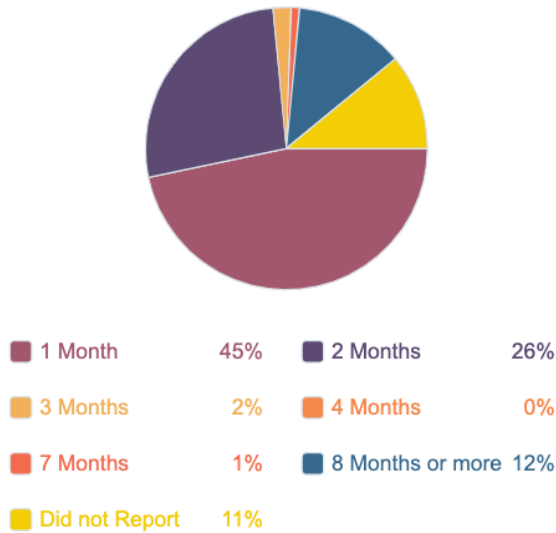


Very Likely 11% Somewhat Likely 28%
Not Very Likely 41% Not Likely at All 18%

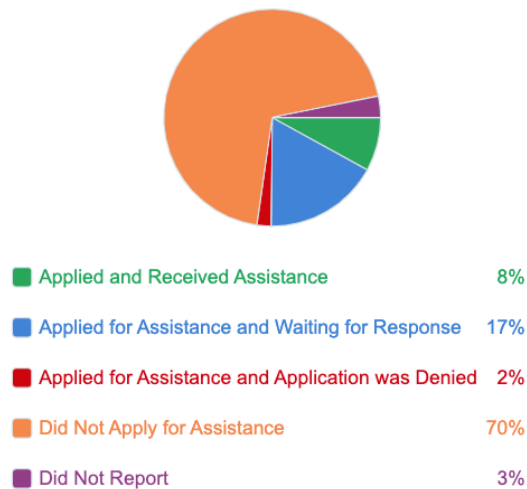
Indicators of the Scope of the Problem: Months Behind on Rent and Rental Assistance

The following graph display responses to questions only asked of Arizona renters not caught up on their rent: 12.2% of all AZ renter households – January 26th 2022– February 7th 2022.

Months Behind on Rental Payments
Arizona Renters Not Current on Rent - Jan 26 - Feb 7 2022



Rental Assistance Through State or Local Government
Arizona Renters Not Current on Rent - Jan 26 - Feb 7 2022

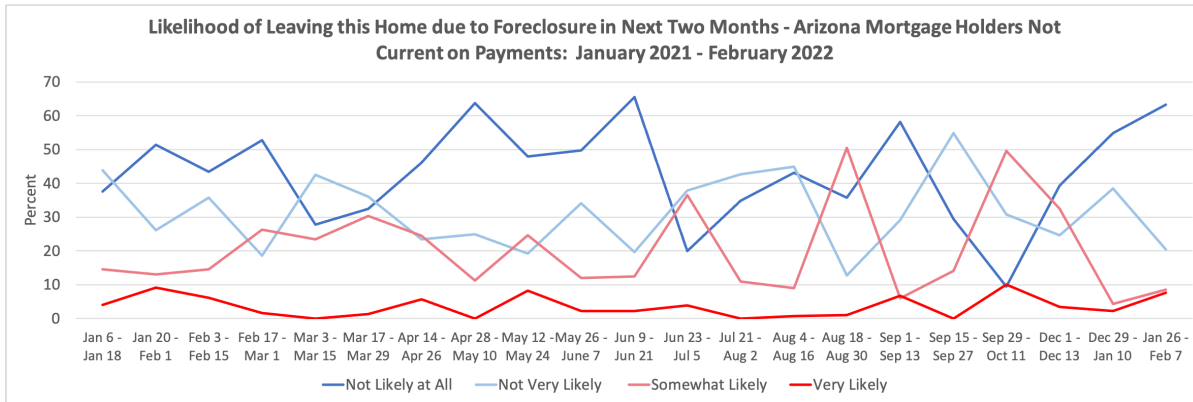


Consistent with previous survey waves, this most recent survey indicates that the majority of Arizona renters who are behind on their rent, 71%, are only 1 or 2 months behind on their payments. This most recent survey also suggests substantial improvement in the share of renters who report being behind 8 months or more on payments. This share has fallen from 35% of non-current renters in early October to 12% in this wave. This is great news and indicates substantial improvement in the financial positions of Arizona renters.



Indicators of the Scope of the Problem: Leaving Due to Foreclosure Among Arizona Mortgage Holders Not Caught Up on Payments

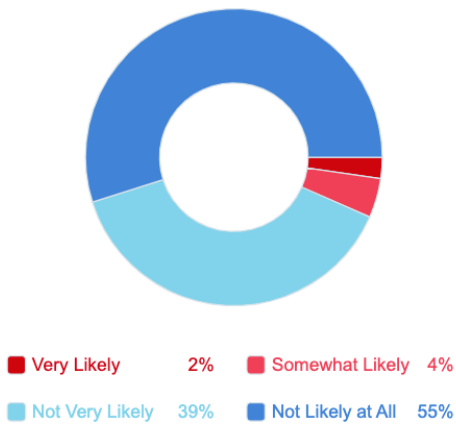
The trends in the graph below are based on questions only asked of Arizona mortgage holders not caught up on their payments: **3.2% of all AZ mortgage holding households – Jan 26th - Feb 7th 2022**



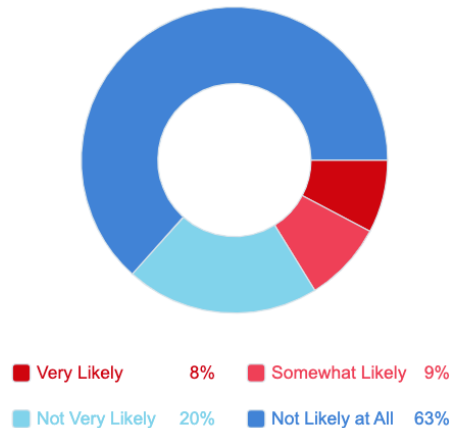
Strong improvement in this most recent wave. The proportion reporting “very” or somewhat” likely increased modestly, but this is a larger proportion of a very small number of mortgage holders late on payments (7% in prior wave).

Source: Census Household Pulse Survey –Weeks 22 – 42

Likelihood of Leaving this Home due to Foreclosure in Next Two Months - Arizona Mortgage Holders - Dec 29 2021 - Jan 10 2022



Likelihood of Leaving this Home due to Foreclosure in Next Two Months - Arizona Mortgage Holders - Jan 26 - Feb 7 2022



Indicators of the Scope of the Problem: Estimates of Rental Shortfall– ARIZONA

Estimates of the number of individuals behind on rent and the size of their rental debts (at both the state and county level) have been made available in the *National Equity Atlas* data tool. This tool is produced by PolicyLink and the USC Equity Research Institute. The methodology used to produce these estimates is provided in the appendix to this report. These estimates rely on Census Household Pulse survey data and the estimates below are based on the data collected as a part of Wave 40 of the survey conducted December 1st - 13th 2021. In Wave 40, 6.5% of Arizona renters were behind on the rent, the percentage of renters not current statewide in Wave 42 was 12.2%.

National Equity Atlas – Estimates based on Wave 40 of the Census HPS

| Estimated Number of Arizona Households Behind on Rent | Estimated Total Rental Debt Statewide | Estimated Rental Debt per Household |
|---|---------------------------------------|-------------------------------------|
| 71,000 | \$128.8 million | \$1,800 |

Indicators of the Scope of the Problem: Estimates of Rental Shortfall– PIMA COUNTY

The *National Equity Atlas* data tool also provides county level estimates. The estimates below are also based on the data collected as a part of Wave 40 of the Census Household Pulse survey conducted December 1st - 13th 2021.

National Equity Atlas – Estimates based on Wave 40 of the Census HPS

| Estimated Number of Pima County Households Behind on Rent | Estimated Total Rental Debt Countywide | Estimated Rental Debt per Household |
|---|--|-------------------------------------|
| 10,000 | \$18.4 million | \$1,900 |



“Back of the Envelope” Estimates of Potential Displacement and Homelessness Based on Estimates of Total Households Behind on Rent Payments- ARIZONA

The estimates provided below take the estimated number of Arizona households behind on their rent (and the adjusted estimates) from the National Equity Atlas and then provides ranges of possible outcomes for both displacement and homelessness as a result of these potential housing displacements. Many and probably most will be helped enormously by current and forthcoming assistance. The exercise here provides examples of the size of the potential increase in homelessness depending on the proportion of these at-risk households that actually experience a housing disruption. What does it look like, for example, if 20% of the vulnerable households estimated by the National Equity Atlas to be at risk actually experience a housing displacement? No sophisticated modeling approaches were used to generate these figures, just calculations of proportions of the National Equity

| At Risk Pop ARIZONA | Estimate of # of Households Potentially Facing Housing Disruption or Eviction Filings | Adjustment (not all housing insecurity results in displacement) and forthcoming assistance will reduce hardship. Number of Households | Number of People Average HH Size in AZ = 2.69 #HH*2.69 | Assuming 25% of displaced actually become homeless | Assuming 10% of displaced actually become homeless |
|------------------------|---|--|--|--|--|
| Renters not Current | 71,000 | 10% result in displacement: 7,100 | 19,099 | 4,775 | 1,910 |
| Renters not Current | 71,000 | 20% result in displacement: 14,200 | 38,198 | 9,550 | 3,820 |

Atlas estimates of households at risk. **As such, these are “back of the envelope” calculations to provide a rough sense of the ranges of strain that could emerge depending on the extend of the ameliorative impacts of forthcoming relief assistance (unemployment insurance, stimulus checks, rental assistance, & etc). Please do not cite or distribute these figures without these caveats and without checking with the author first. See next page for caveats.**

These National Equity Atlas estimates from early-October only provide an estimate of the number of Arizonans not current on their rent and an estimate of the extent of their rental debt. The exercise above then simply provides ranges of possible impacts depending on how many people are actually displaced from their housing. In order to get a rough sense of whether these estimates are realistic, we can compare these estimates to other available indicators. These estimates are based on Wave 40 data of the Census Household Pulse Survey. The Census Household Pulse Survey asks if renting households are current on their rent. In the most recent wave of the survey, Week 42 conducted January 26th- February 7th 2022, 12.2% of Arizona renter households reported not being current on their rent payments. There were 927,771 renter-occupied units in Arizona in 2019, according to a Census American Community Survey (1-year) estimate.

12.2% of 927,771 = 113,118 AZ renter households who are not current on their rent payments.

Not all, and perhaps only a minority, of households reporting that they are not current on rent payments will actually experience an eviction. These households were then asked about their perception of how likely it is that they will have to leave their home due to eviction in the next two months. 10.7% of these households that are not current on their rent reported being “very likely” to be evicted, while another 27.7% said this is “somewhat likely”.

10.7% of 113,118 = 12,111 AZ renter households who think it is “very likely” that they will be evicted in the next two months.

38.4% of 113,118 = 43,464 AZ renter households who think it is either “somewhat likely” or “very likely” that they will be evicted in the next two months.

These comparisons suggest that the hypothetical scenario outlined above of 20% of the Arizona renter households not current on their payments being at risk of a potential housing displacement (roughly 14k rental households) may be a better estimate of the extent of financial strain among Arizona renters. **To be clear, the vast majority of these households will benefit substantially from benefits and relief assistance and most will be at substantially lower risk of eviction as a result.**



“Back of the Envelope” Estimates of Potential Displacement and Homelessness Based on Estimated Total Eviction Filings - PIMA COUNTY

The estimates provided below take the estimated number of Pima County households behind on their rent (and the adjusted estimates) from the National Equity Atlas and then provides ranges of possible outcomes for both displacement and homelessness as a result of these potential housing displacements. Many and probably most will be helped enormously by current and forthcoming assistance. No sophisticated modeling approaches were used to generate these figures, just calculations of proportions of the National Equity Atlas estimates of households at risk. **These are “back of the envelope” calculations to provide a rough sense of the ranges of strain that could emerge depending on the extend of the ameliorative impacts of forthcoming relief assistance (unemployment insurance, stimulus checks, rental assistance, & etc).**

| At Risk Pop PIMA COUNTY | Estimates of # of Households Potentially Facing Housing Disruption or Eviction Filings | Adjustment (not all housing insecurity results in displacement) and forthcoming assistance will reduce hardship. Number of Households | Number of People Average HH Size in AZ = 2.69 #HH*2.69 | Assuming 25% of displaced actually become homeless | Assuming 10% of displaced actually become homeless |
|--------------------------------|--|--|--|--|--|
| Renters not Current | 10,000 | 10% result in displacement: 1,000 | 2,690 | 673 | 269 |
| Renters not Current | 10,000 | 20% result in displacement: 2,000 | 5,380 | 1,345 | 538 |

Please do not cite or distribute these figures without these caveats and without checking with the author first.

These National Equity Atlas estimates from early-October only provide an estimate of the number of Pima County renters not current on their rent and an estimate of the extent of their rental debt. The exercise above then simply provides ranges of possible impacts depending on how many people are actually displaced from their housing. In order to get a rough sense of whether these estimates are realistic, we can compare these estimates to other available indicators. These estimates are based on Wave 40 data of the Census Household Pulse Survey. The Census Household Pulse Survey asks if renting households are current on their rent. In the most recent wave of the survey, Week 42 conducted January 26th- February 7th 2022, 12.2% of Arizona renter households reported not being current on their rent payments. There were 151,943 renter-occupied units in Pima County in 2019, according to a Census American Community Survey (1-year) estimate.

12.2% of 151,943 = 18,537 Pima County renter households who are not current on their rent payments.

Not all, and perhaps only a minority, of households reporting that they are not current on rent payments will actually experience an eviction. These households were then asked about their perception of how likely it is that they will have to leave their home due to eviction in the next two months. 10.7% of these households that are not current on their rent reported being “very likely” to be evicted, while another 27.7% said this is “somewhat likely”.

10.7% of 18,537 = 1,983 Pima County renter households who think it is “very likely” that they will be evicted in the next two months.

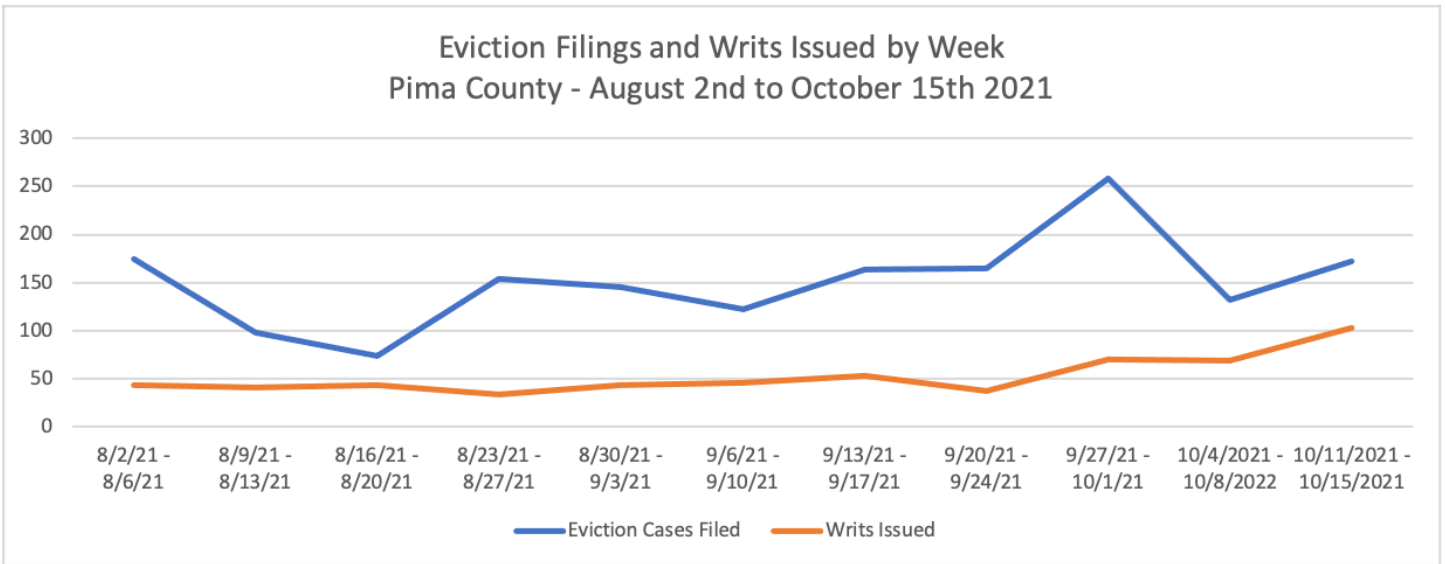
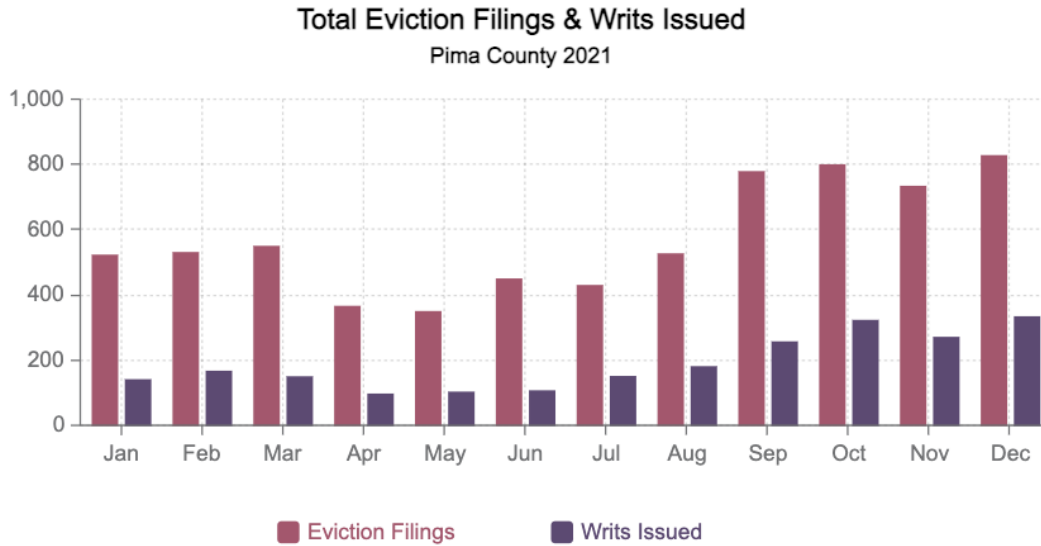
38.4% of 18,537 = 7,118 Pima County renter households who think it is either “somewhat likely” or “very likely” that they will be evicted in the next two months.

These comparisons suggest that the hypothetical scenario outlined above of 20% of Pima County renter households not current on their payments being at risk of a potential housing displacement (roughly 2,000 households) may be a better estimate of the percentage of households at risk (when compared with the information offered in the most recent Census Household Pulse survey). **To be clear, the vast majority of these households will benefit substantially from benefits and relief assistance and most will be at substantially lower risk of eviction as a result.**



Eviction Filings and Writs Issued

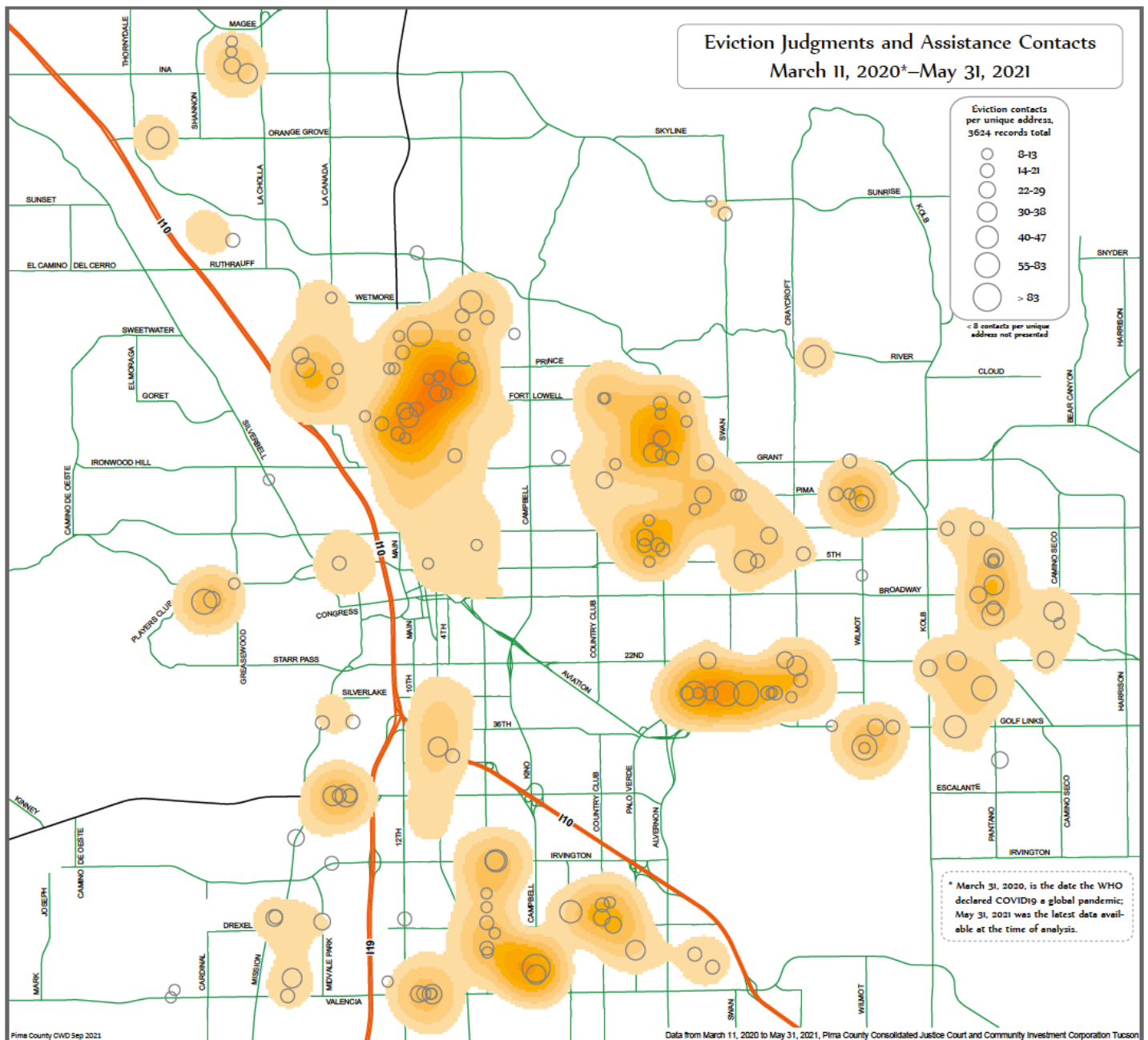
The Supreme Court allowed a lower court decision to end the CDC’s extension of the eviction moratorium on the evening of August 26th. Below the total count of eviction filings and writs issued in Pima County is provided for all of 2021 by month, and since 8/2/21 by week. Unfortunately, for reasons that are unclear, the reports that these weekly figures are based on are no longer being issued.



Source: Derek M. Zenner, Court Operations Analyst, Pima County Consolidated Justice Court

Evictions Judgements and Assistance Contracts – Tucson

The map below displays the geographic concentration of all eviction judgements issued from March 11, 2020 – May 31, 2021 overlaid on the concentration of rental assistance contracts issued by the Community Investment Corporation (CIC). There is clearly a strong relationship between the concentration of evictions and rental assistance as we would hope and expect. These specific areas are also highly likely to be the areas where currently unfolding evictions judgements are occurring.

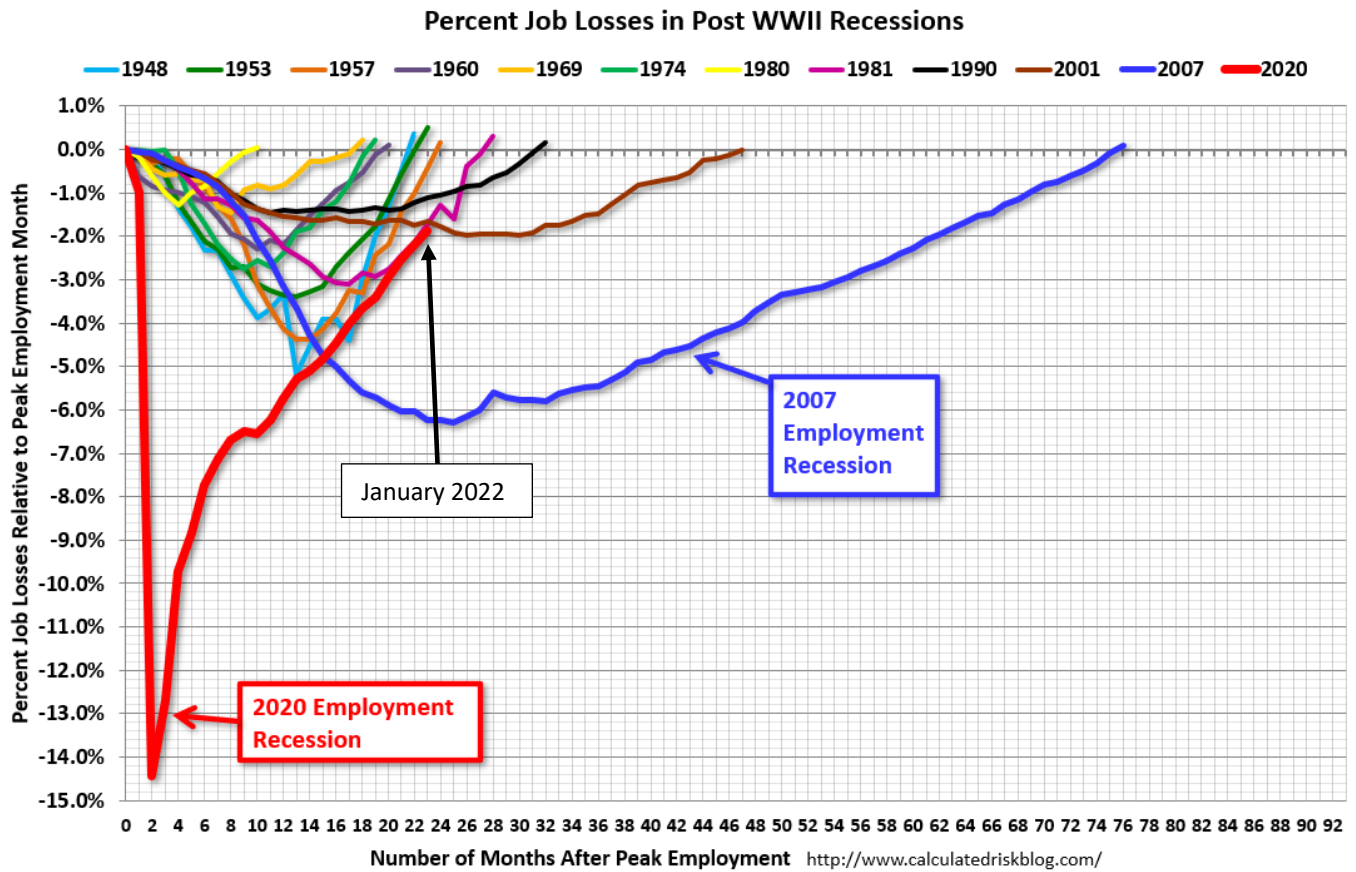


Source: Joel Viers, Pima County



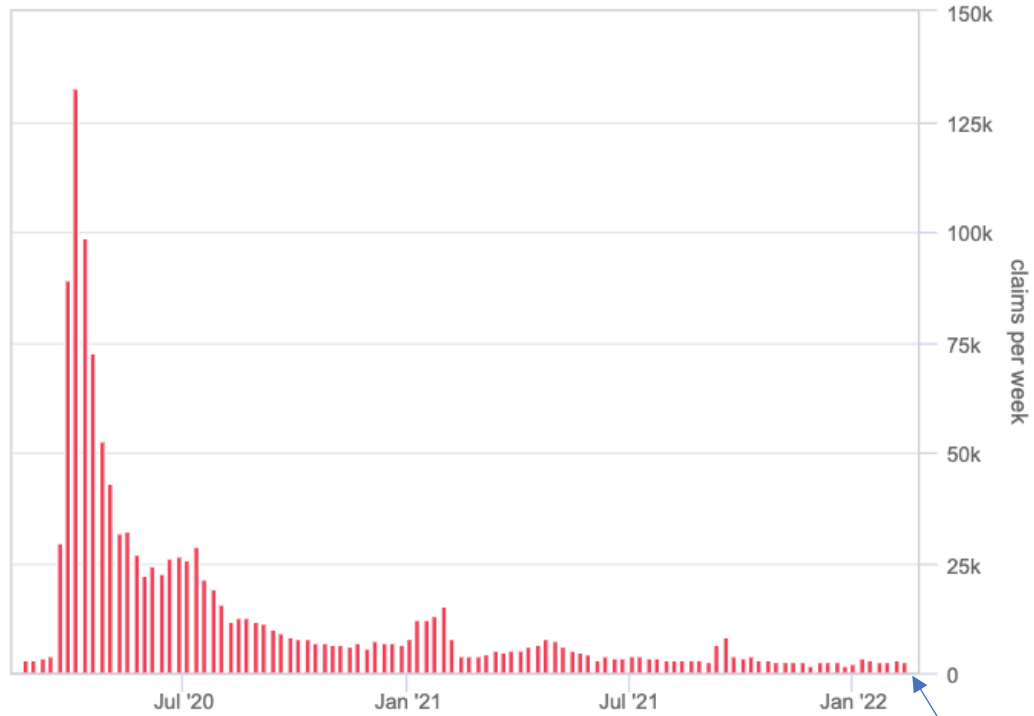
The Road Ahead

We are currently experiencing job growth at both the national and state level. In the medium-term, most economists are expecting continuing robust growth and falling unemployment, with the caveat that the impact of the recent surge in COVID cases may slow this growth. The households at high risk of experiencing a housing disruption in the coming months remain disproportionately lower income and households of color. I remain concerned about the likelihood of homelessness among those households that experience a housing disruption over the next couple of months, as it is not guaranteed that employment opportunities are an option for everyone to replace lost earnings.



Source: Calculated Risk Finance & Economics

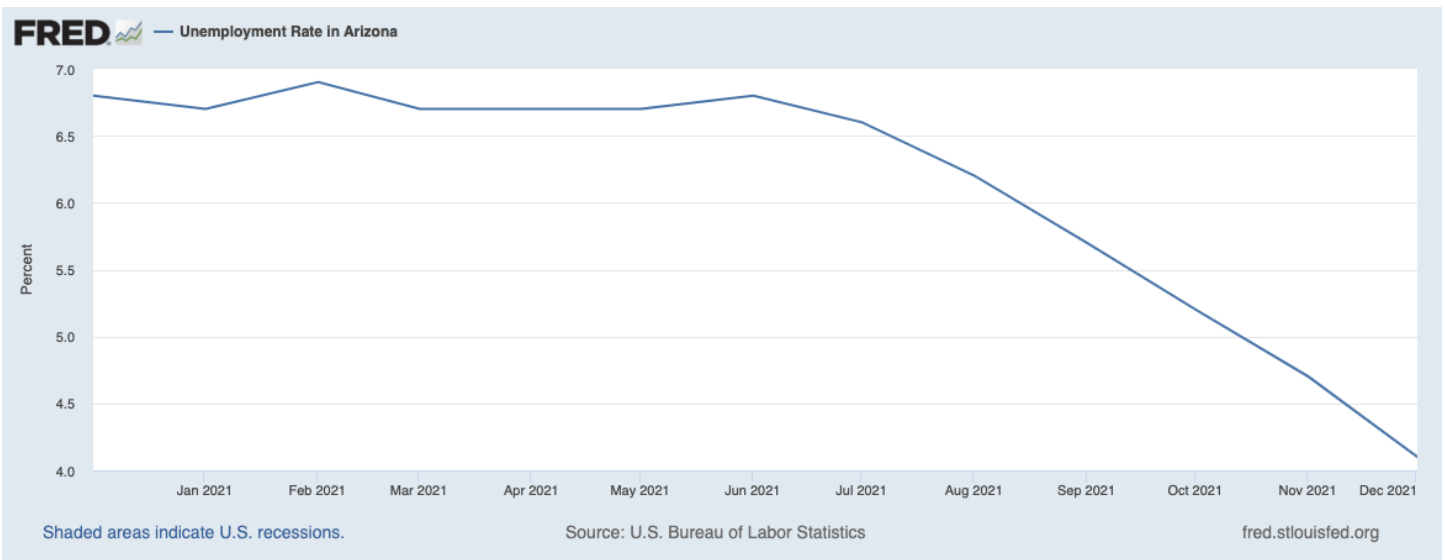
Arizona Initial Claims for Unemployment Insurance



● Initial Claims for Unemployment Insurance
 Source: UA Economic and Business Resource Center

Week of February 12th

Arizona Unemployment Rate



Shaded areas indicate U.S. recessions.

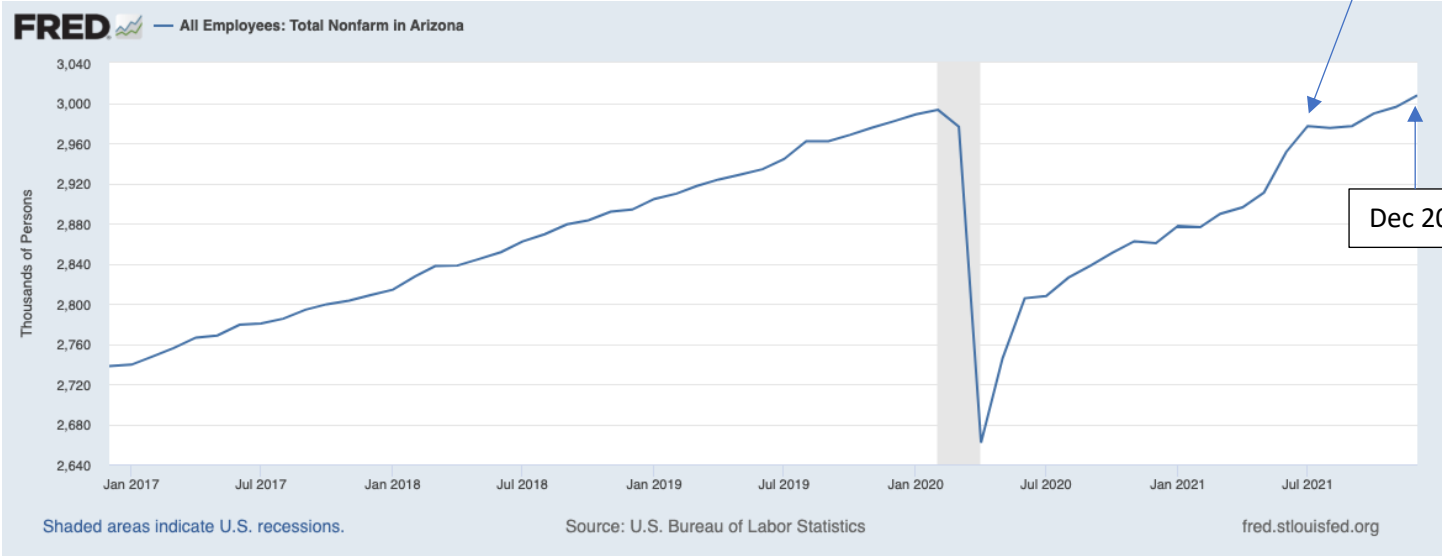
Source: U.S. Bureau of Labor Statistics

fred.stlouisfed.org



Total Nonfarm Employment Arizona

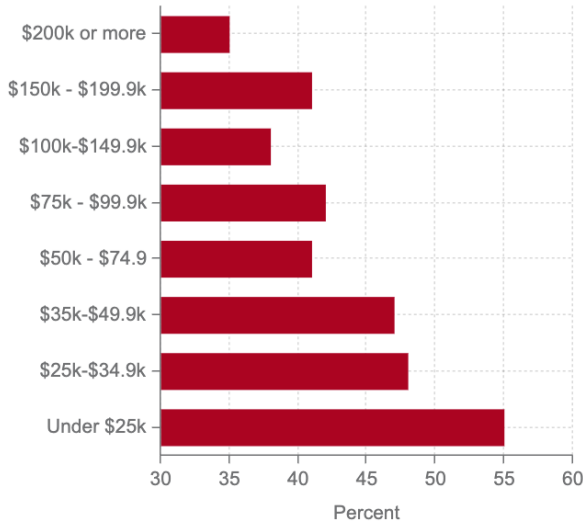
Extremely strong job growth in June, strong growth in July, growth slowed substantially in August.



Income Disparities

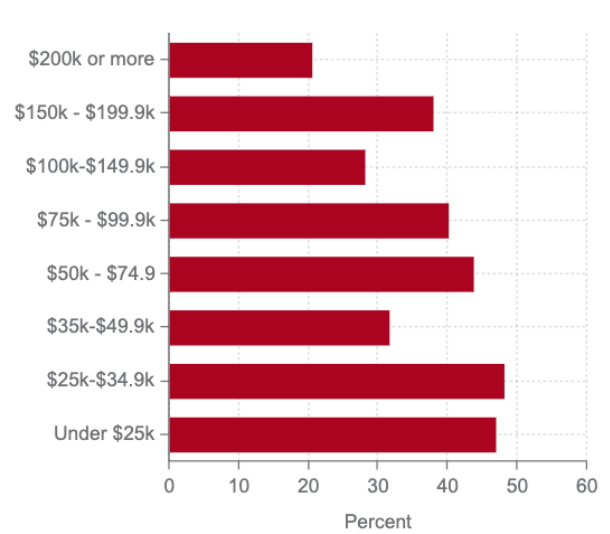
The COVID-19 recession has been uniquely unequal in its impacts, hitting lower income workers and households particularly hard. Worse, the recovery from these disproportionate impacts has also been skewed towards those with more resources, resulting in the so-called “K”-shaped recovery.

Household Experienced Loss of Employment Income Since March 13, 2020 - ARIZONA



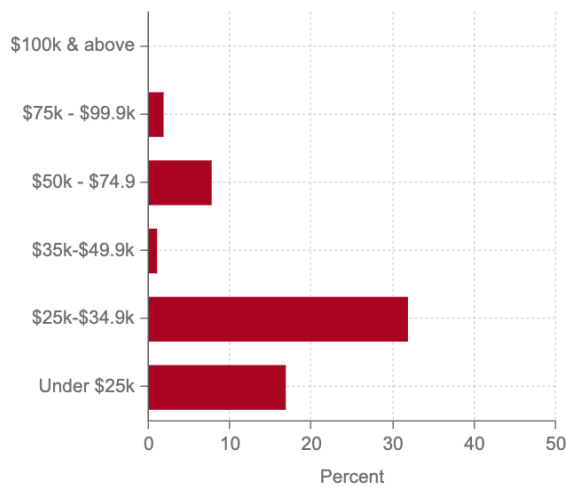
Source: Census HPS Week 14 –Sept 2nd- 14th 2020

Household Experienced Loss of Employment Income Since March 13, 2020 - ARIZONA



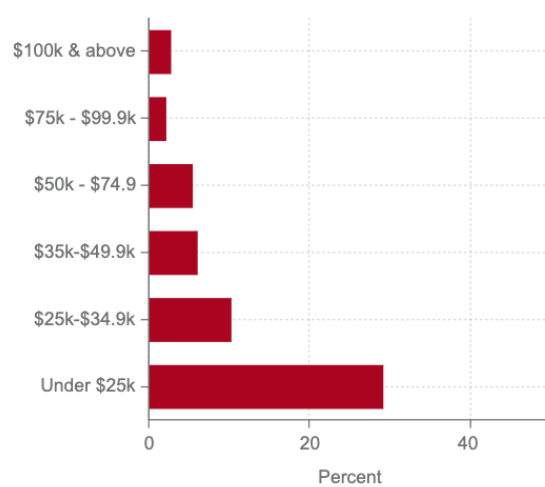
Census HPS Week 27 –March 17th– 29th 2021

Renter Households Not Current on Rent by Income ARIZONA Renter Households - June 23 - July 5 2021



Source: Census HPS Week 33 –June 23rd– July 5th 2021.

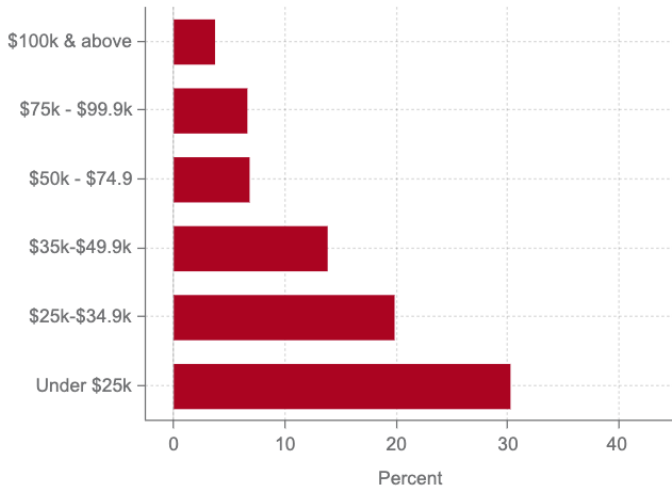
Renter Households Not Current on Rent by Income ARIZONA Renter Households - Jan 26 - Feb 7 2022



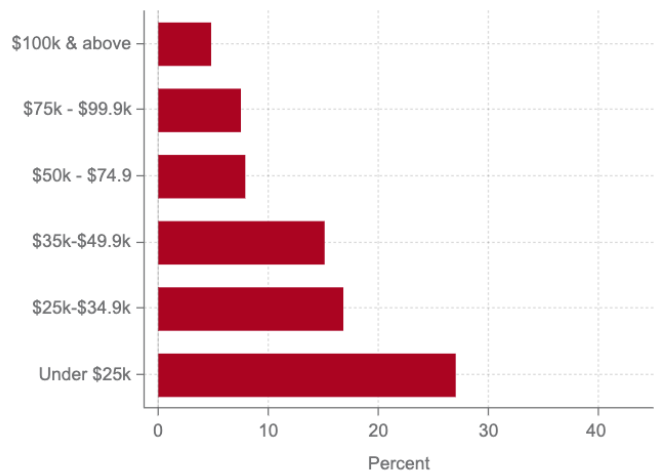
Census HPS Week 42 –Jan 26th – Feb 7th 2022.



Households Finding it Very Difficult to Meet Usual Expenses
ARIZONA Households by Income - Dec 29 - Jan 10 2022



Households Finding it Very Difficult to Meet Usual Expenses
ARIZONA Households by Income - Jan 26 - Feb 7 2022



Source: Census Household Pulse Survey –Week 41

Census Household Pulse Survey –Week 42

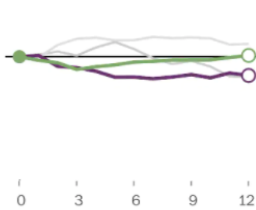
The coronavirus crisis is different

Job growth (or loss) since each recession began, based on weekly earnings

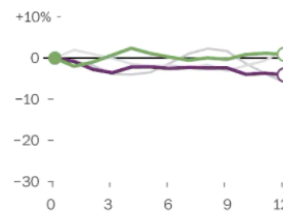
1990 recession



2001 recession



2008 recession



Coronavirus crisis



Notes: Based on a three-month average to show the trend in volatile data.
Source: Labor Department via IPUMS, with methodology assistance from Ernie Tedeschi of Evercore ISI
THE WASHINGTON POST

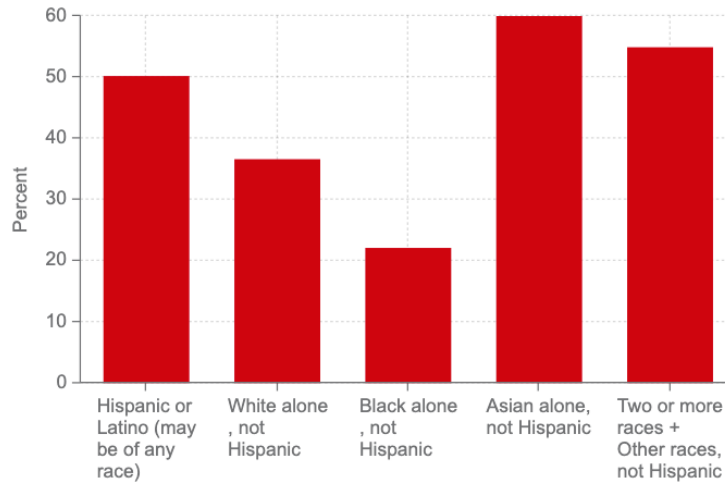
Source: Long et al. "The covid-19 recession is the most unequal in modern history." Washington Post. Sept 30 2020.

Consequently, lower-income households are at particularly high risk of housing insecurity and homelessness during this recession.

Racial/Ethnic Disparities

The current recession is also disproportionately impacting individuals and communities of color, trends evident in both losses of employment income and housing insecurity.

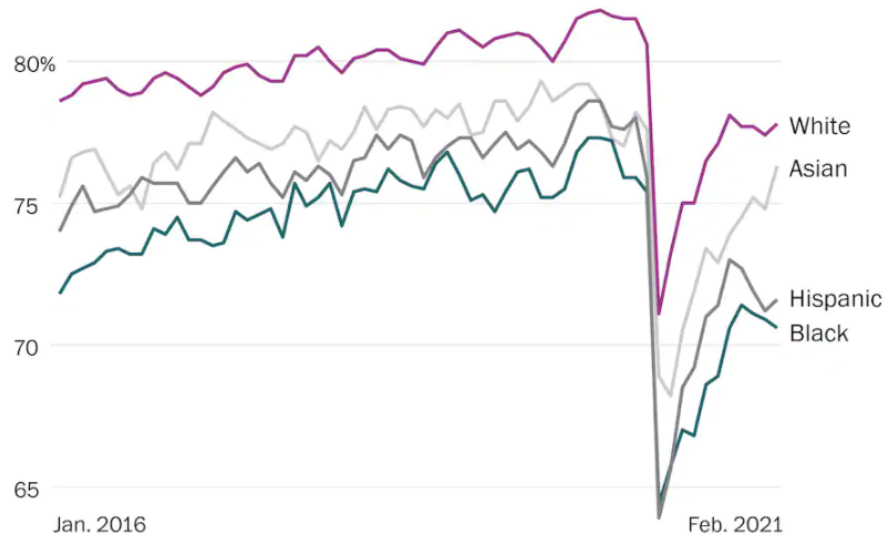
**Experienced Loss of Employment Income Since March 13, 2020
ARIZONA by Race/Ethnicity**



Source: Census Household Pulse Survey –Week 26 – March 3rd – 15th 2021

Share of prime-age adults who have jobs

Employment-population ratio of those 25-54 years old by race or ethnicity



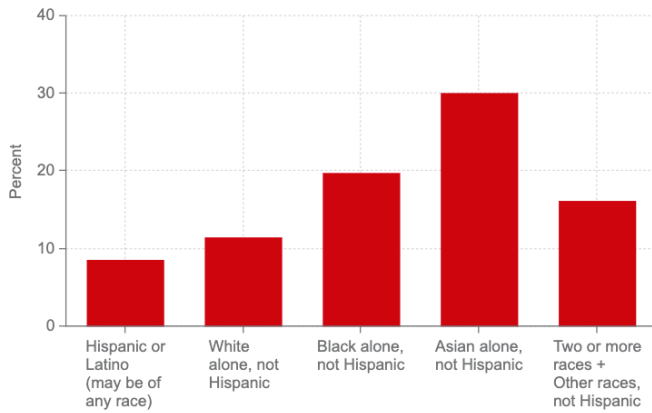
Source: Labor Department

THE WASHINGTON POST

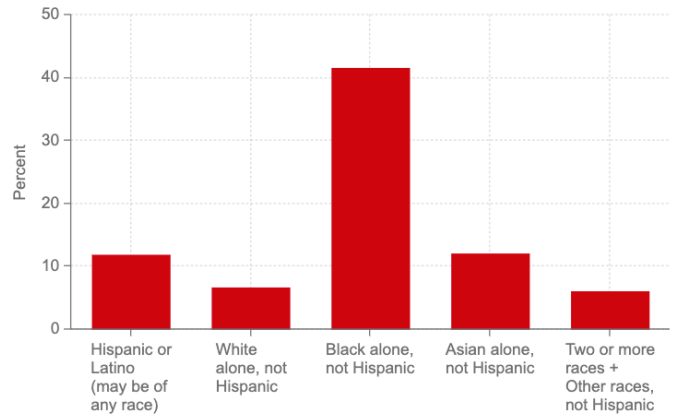
Source: Siegel, R. "The soft underbelly to a looming economic boom: Millions will miss out." *Washington Post*. March 30 2021.



Percent Not Current on Rent by Race/Ethnicity
ARIZONA Renter Households - Dec 29 - Jan 10 2022



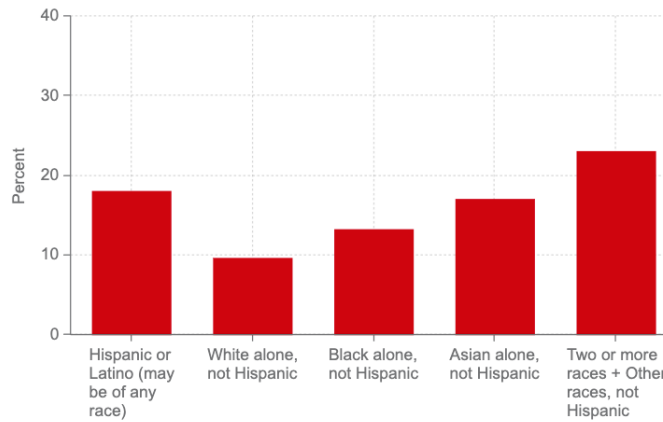
Percent Not Current on Rent by Race/Ethnicity
ARIZONA Renter Households - Jan 26 - Feb 7 2022



Source: Census Household Pulse Survey –Week 41

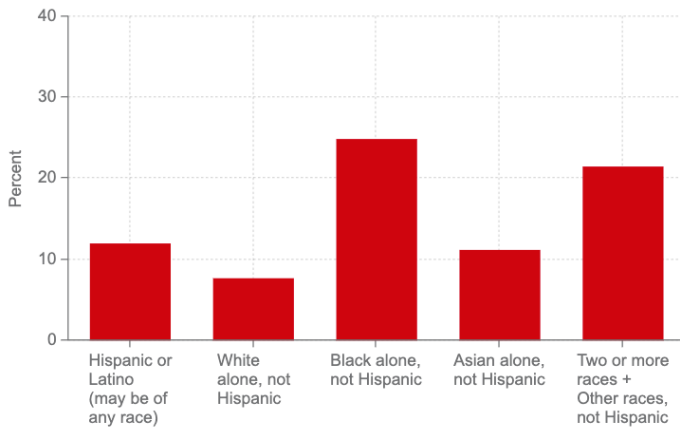
Census Household Pulse Survey –Week 42

"Very Difficult" to Pay Usual Expenses in Last Week
ARIZONA Renter Households - March 3 - 15th

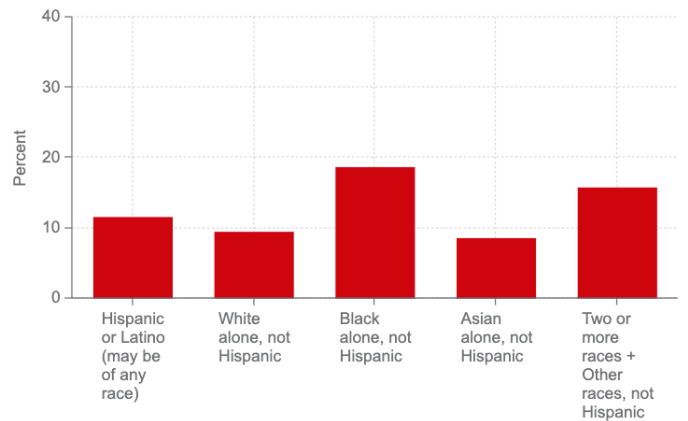


Source: Census Household Pulse Survey –Week 26

"Very Difficult" to Pay Usual Expenses in Last Week
ARIZONA Renter Households - Dec 29 - Jan 10 2022



"Very Difficult" to Pay Usual Expenses in Last Week
Arizona Renter Households - Jan 26 - Feb 7 2022



Source: Census Household Pulse Survey –Week 41

Census Household Pulse Survey –Week 42



Those behind on rent are overwhelmingly low-income households who experienced job and income losses during the pandemic.

Characteristics of Renters Behind on Rent, Arizona

People of Color



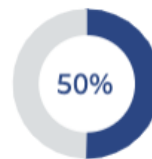
Low Income



Unemployed

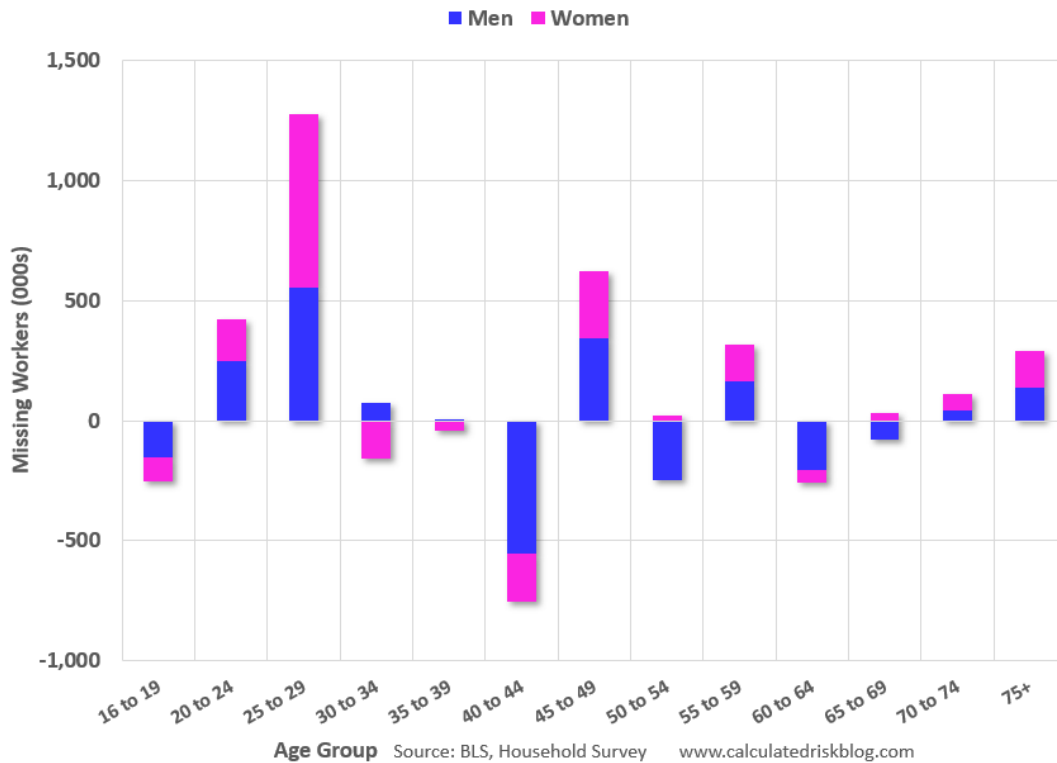


Households with Children



Source: National Equity Atlas – Estimates based on Wave 40 of the Census HPS

Missing Workers by Age Group, Jan 2020 vs Jan 2022, NSA



Appendix: National Equity Atlas Rent Debt Methodology¹

This document describes our current methodology for estimating the number of renter households behind on rent and the total and per household rent debt for the United States and selected counties, regions, and states, as presented in the Rent Debt Dashboard.

Our estimates use the share of households behind on rent from the Census Household Pulse survey and the median contract rent paid by households from the American Community Survey, both broken down by income bracket, to determine the total amount of monthly rent owed by households behind on rent. We then multiply these monthly figures by the average number of months that households are in arrears to estimate total rent debt. We assume that approximately 25 percent of behind households are one month behind, 28 percent are two months behind, 12.5 percent are three months behind, and 5.5 percent have not paid for the entire pandemic. We use three data sources:

1. Household rent and income data from the 5-year 2019 American Community Survey (ACS) summary file and microdata.
2. Data on late payment of rent from the U.S. Census Bureau's Household Pulse Survey for states and the 15 largest metros. The Pulse survey is updated every two weeks.
3. Distribution of rent arrears estimates derived from the University of Southern California's Center for Economic and Social Research's "[Understanding Coronavirus in America](#)" panel survey, which has been collected between April 2020 and March 2021.

The process and data are further described below:

Household Pulse Survey data is filtered to include only renting households paying a non-zero rent in the most recent survey wave. Those households are assigned a rent status based on their response to the survey question: "Is this household currently caught up on rent payments?." The percentage of households in rent arrears – the "behind rate" – is calculated by household income category and by geography. Households are initially grouped into three income categories: those with an annual income less than \$50,000, those with an annual income between \$50,000 and \$100,000, and those with an annual income greater than \$100,000. Pulse estimates are available for all 50 states and for the 15 largest metropolitan regions in the US. For geographies where regional data are available, we use regional estimates of behind rates; for geographies where regional data are not available, we use statewide estimates of behind rates. If the unweighted count of observations for a given income category within a metropolitan region falls below 100 in the most recent Pulse survey wave, statewide behind rates are used for households in that income category in that metropolitan region instead. If unweighted counts of statewide observations fall below 100 for either of the top two income categories but the two categories combined have more than 100 observations, a single rate is used for both of the categories. If unweighted counts of statewide observations fall below 100 for the top two income categories combined or for the lowest income category, a single behind rate is used for all households in the state. If a state has fewer than 100 unweighted observations, national behind rates are used and rent debt estimates are not calculated for that state.

The estimates of the percent of households behind on rent by income bracket are necessarily broad, in geographic terms, given data availability in the Household Pulse Survey. However, to estimate monthly rent debt for households that are behind, they are applied to estimates of median monthly contract rent by income bracket that are geographically specific (i.e. based on the same cities and counties for which the rent debt estimates are ultimately

¹ Source: <https://nationalequityatlas.org/rentdebtmethodology>

reported). We use median rent (rather than mean rent) based on the assumption that renters who are behind on rent are likely to have lower monthly rent than the average for each income bracket. Estimating median monthly contract rent by income bracket was straightforward for states, regions, and larger cities and counties as they could be drawn directly from the ACS microdata. For smaller cities and counties not identified in the ACS microdata, however, we developed an approach that relied primarily on the ACS summary file with some inputs from the microdata.

Specifically, we drew information from Table B25122 of the ACS summary file on the number of households by income bracket gross rent bracket and utilized a Pareto interpolation procedure to estimate median monthly gross rent for each of the aforementioned income brackets in each geography. This procedure required an upper bound for the top gross rent category (\$2,000 or more), which is not provided in Table B25122. To adjust our estimate to reflect median contract rent (rather than median gross rent, which includes the cost of utilities), we also needed an adjustment ratio to apply to our resulting Pareto estimates.

We estimated these data inputs for each of the smaller city and county geographies using ACS microdata for the Public Use Microdata Area (PUMA) or PUMAs they intersect. This was accomplished using population-based crosswalks we developed between 2010 PUMAs and 2010 counties, and between 2010 PUMAs and 2010 census-defined places (which include all cities), by taking a population-weighted average of the PUMA-level measures for each smaller city and county geography. Following this approach, we estimated the maximum gross rent, median gross rent, and median contract rent for overall and for each income bracket. The estimated maximum gross rent is inputted into the Pareto interpolation procedure to estimate median gross rent by income bracket for each of the smaller city and county geographies. Those initial estimates were then adjusted to reflect median contract rent by multiplying by the ratio of median contract to gross rent from the PUMA-based estimates. The approach seeks to utilize as much geographically-specific information from the ACS summary file as possible and substitutes in less geographically-specific information from the ACS microdata as necessary.

We assume that differences between reported rents from the 2019 5-year ACS (which reflect a 2015-2019 average expressed in inflation-adjusted 2019 dollar values) and 2020 actual rents are negligible for households that have not moved in 2020, as those households were likely locked into pre-pandemic leases and/or month-by-month agreements with fixed/stable rents. The total amount of monthly rent owed by behind households is then calculated by multiplying estimated median monthly rent for each income category by the number of Pulse households in that income category and summing those values for each geography (city or county). Regional and statewide estimates are produced by

summing estimates from their constituent county geographies. These figures are converted to total rent debt by adjusting based on our estimate that households were, on average, 3.75 months in arrears. There is no source of data on the distribution of rent arrears among behind households, so we estimated this distribution based on the University of Southern California (USC) [“Understanding Coronavirus in America” panel survey](#) from April 2020 through March 2021. Restricting the sample to renter households that were recorded at some point during each of the twelve months from April 2020 to March 2021 and determining a household’s behind status in each month based on their response closest to the end of the month, we measure how many months each household reports not paying their rent. Using this method, we found that approximately 25 percent of behind households are one month behind on rent, 28 percent are two months behind, 12.5 percent are three months behind, and 5.5 percent have not paid for the entire pandemic.

These estimates do not take into account the requirement of the California eviction moratorium passed in August 2020 (AB 3088) that Covid-19-affected tenants must pay 25 percent of rent accrued between September 1, 2020 and January 31, 2021 by January 31, 2021 to be protected from eviction. This incentive likely decreases the amount of arrears.

