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 40 Census Household Pulse Survey Data – January 9th 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 quickly 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. This may change in response to the explosive spread of the Omicron variant, but so far the recovery has continued. It appears that the strengthening economy and rental assistance have begun to put a serious dent in housing insecurity in Arizona. The most recent Census Household Pulse Survey wave, conducted December 1st–13th, contained many positive developments. The proportion of Arizona renters not current on rent fell to the lowest level captured in this survey, 6.5% down from 11.8% captured in the previous wave (conducted September 29 -October 11). Another positive development is that the proportion of those non-current renters who reported that they were "very likely" to experience an eviction in the next two months fell dramatically from 24.4% in the last wave to 5.4% in this most recent survey wave. Further, among these non-current renters the vast majority, 77%, are only 1 or 2 months behind on their rent. The proportion that reported being behind 8 months or more fell to 11% from 35% in the previous survey wave.

Overall, the news in this survey wave is very good and captures substantial improvement in the financial situation of renters in Arizona. That said, there are a few indicators that remain of concern. Confidence in one's ability to pay next month's rent has not improved, indicating ongoing financial stress among many renters. This wave also captured a noteworthy increase in the proportion of Arizona mortgage holders who are not current on their payments, 8.3% in this wave, up from 4.5% in the last survey wave from early October. And court statistics from Pima County indicate steady levels of both eviction filings and writs issued in recent months. These are lagging indicators, but recent improvements are not yet showing up in the court statistics.

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.
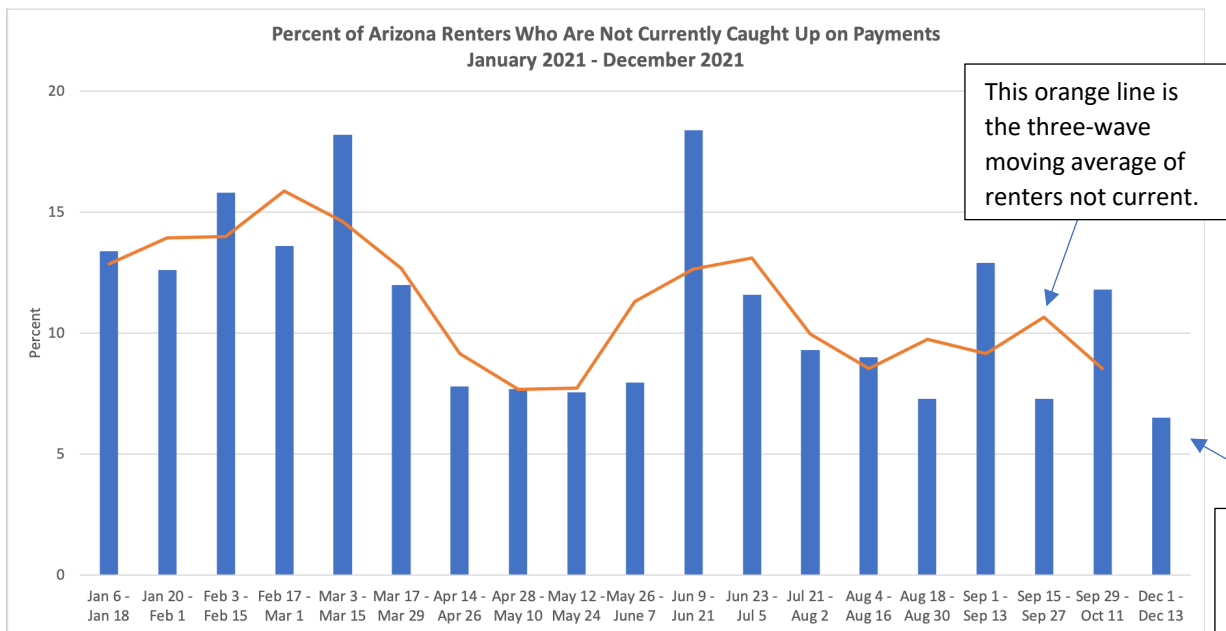
Indicators of the Scope of the Problem: Did Not Pay Rent Last Month
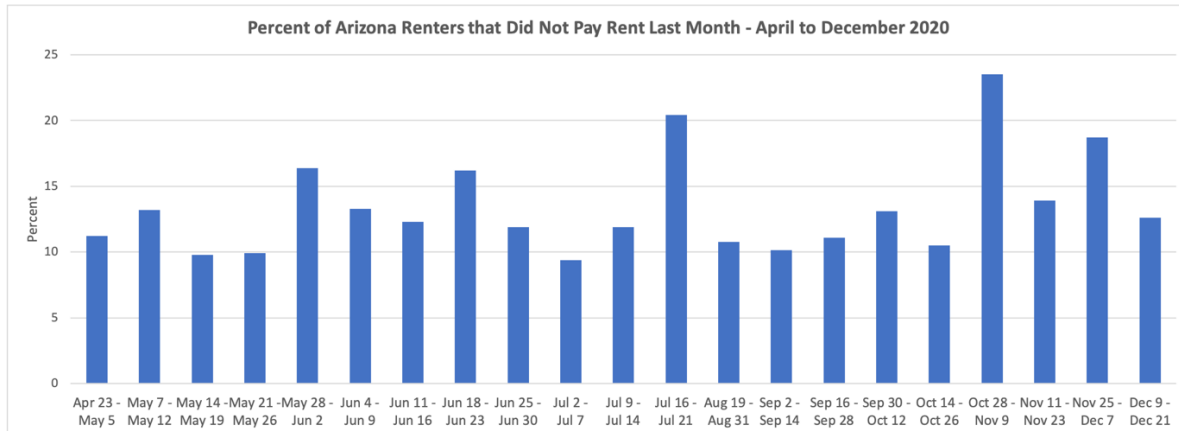
Source: Census Household Pulse Surveys Weeks 1-21

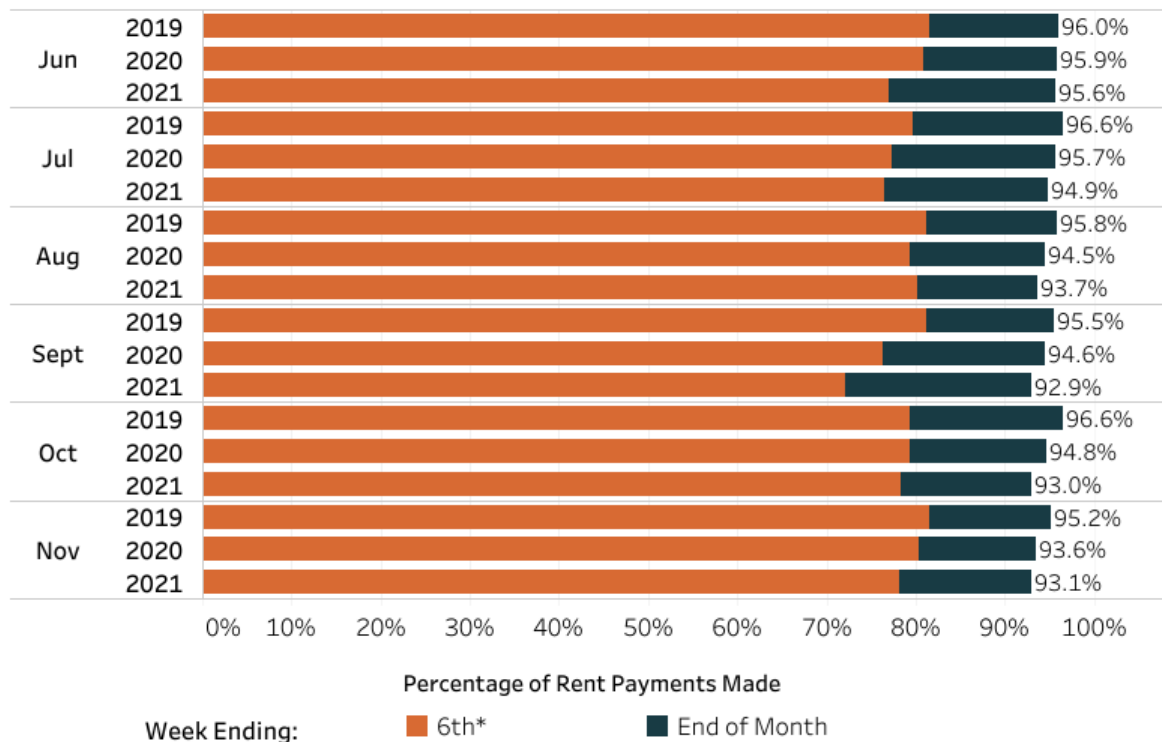## Indicators of the Scope of the Problem: Not Currently Caught Up On Rent

Source: Census Household Pulse Survey –Weeks 22 – 40

Indicators of the Scope of the Problem: National Indicators of Ability to Pay Rent

It has been widely noted that the levels of inability to pay rent reported in the Census Household Pulse Survey are not consistent with the levels of strain captured in other measures, particularly those collected by industry research. The National Multifamily Housing Council collects national rental payment data from an enormous sample of apartments (see figure below).

Rent Payment Tracker: Full Month Results

**Data collected from between 11.1 - 11.8 million apartment units each month

Jun	2019		96.0%
	2020		95.9%
	2021		95.6%
Jul	2019		96.6%
	2020		95.7%
	2021		94.9%
Aug	2019		95.8%
	2020		94.5%
	2021		93.7%
Sept	2019		95.5%
	2020		94.6%
	2021		92.9%
Oct	2019		96.6%
	2020		94.8%
	2021		93.0%
Nov	2019		95.2%
	2020		93.6%
	2021		93.1%

Percentage of Rent Payments Made

Week Ending: ■ 6th*   ■ End of Month

Source: National Multifamily Housing Council

As the of the end of November 2021 93.1% of renters had paid the rent, compared to 95.2% who had paid by the end of November 2019 (see graph above). As of the 6th of December 2021, 77.1% of renters had paid the rent, compared to 83.2% who had paid by the 6th December 2019 (see graph below). In previous reports I have noted the consistent difference in the data signals received from the Census Household Pulse Survey and this national survey from the NMHC. The Census data consistently captured a substantially larger proportion of renter households that were not currently than was found in this NMHC survey. These differences have fallen to a negligible level with both surveys suggesting that 6-7% of renters were not current on their rent at the end of September and in early December (and here we are comparing national level statistics to Arizona numbers so modest differences are to be expected).

Rent Payment Tracker: Weekly Results

**Data collected from between 11.1 - 11.8 million apartment units each month
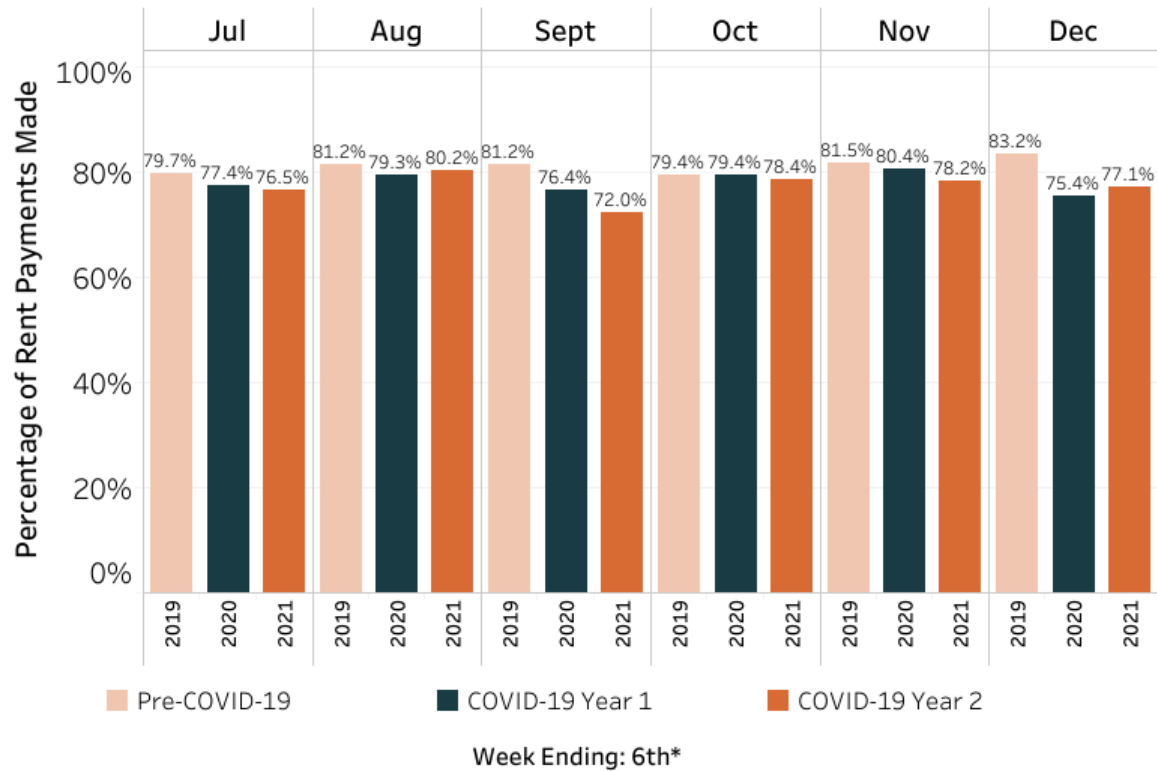
Source: National Multifamily Housing Council

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

Percentage of Arizona Mortgage Holders Who Are Not Currently Caught Up on Payments
January 2021 - December 2021

This orange line is the three-wave moving average of mortgage holders not caught up on payments.

The % not current on payments jumped from 4.5%, in early October to 8.3% in early December. This is concerning if sustained in future surveys.
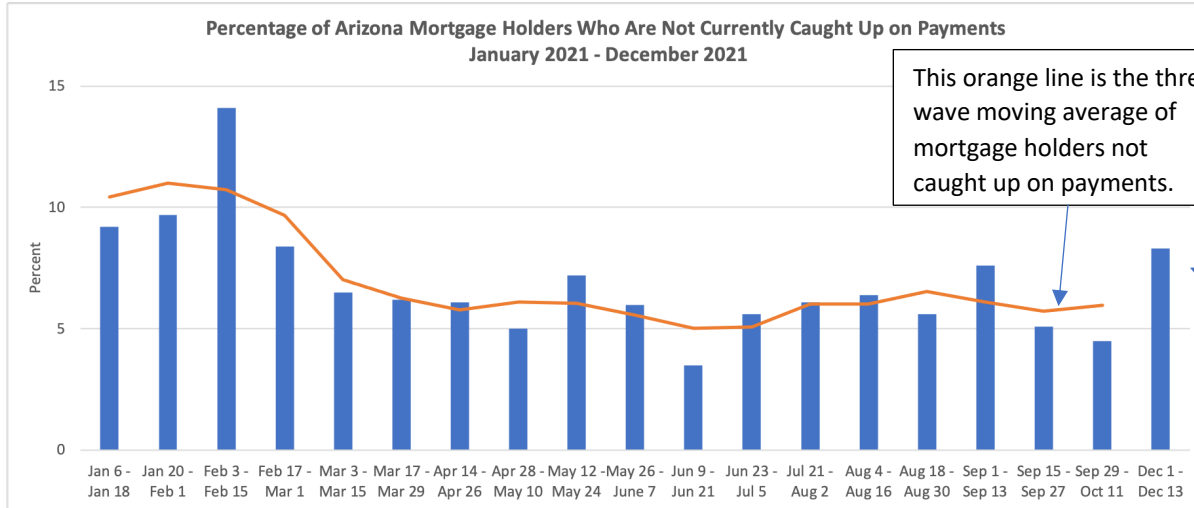
Source: Census Household Pulse Survey –Weeks 22 – 40
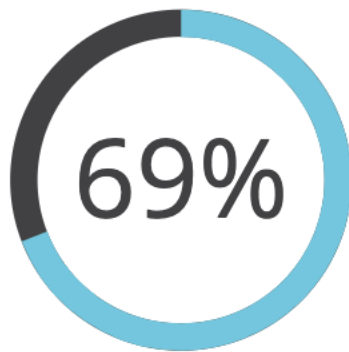
69% Homeownership Rate in Arizona in 2020

Source: U.S. Census Bureau

Indicators of the Scope of the Problem: Ability to Pay Next Month's Rent
Arizona Renters
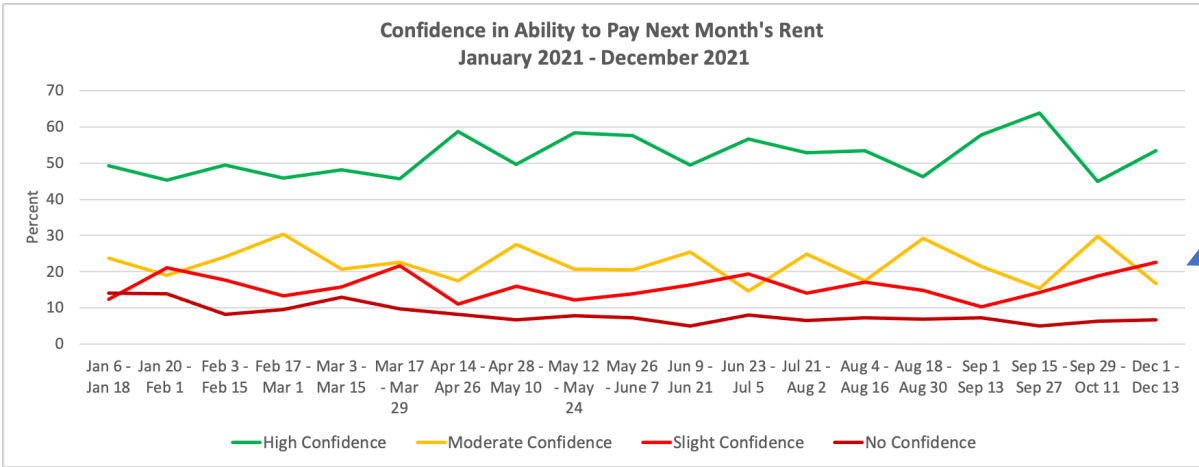
No confidence remains low, but growth in the share with only slight confidence.

Source: Census Household Pulse Survey –Weeks 22 - 40

Confidence in Ability to Pay Next Month's Rent
Arizona Renters - Dec 1 - 13

■ No Confidence	7%	■ Slight Confidence	23%
■ Moderate Confidence	17%	■ High Confidence	54%
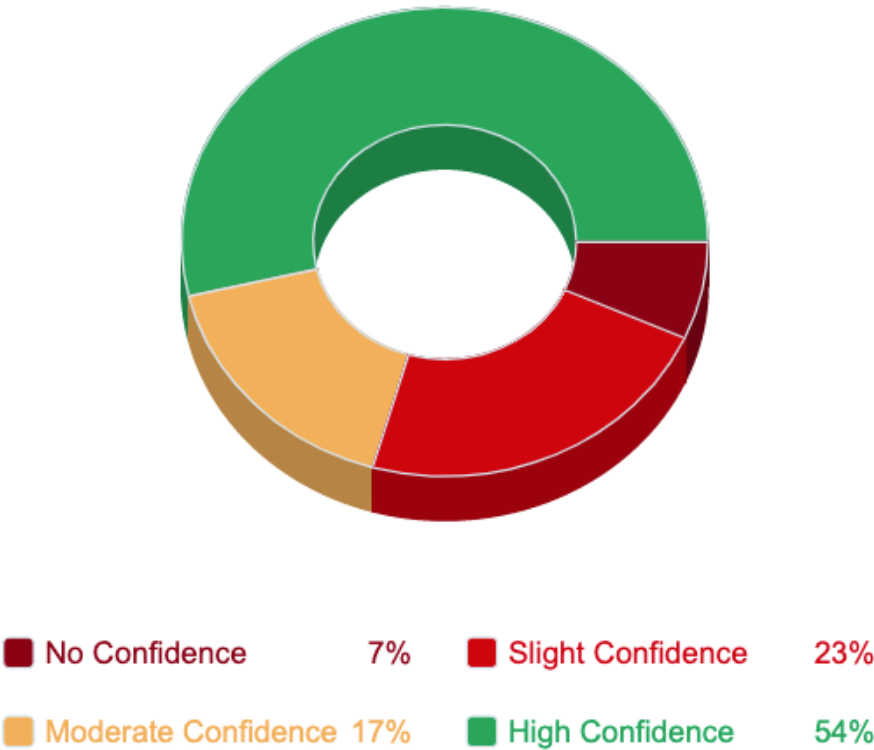
Indicators of the Scope of the Problem: Likelihood of Leaving Due to Eviction Among Arizona Renters Not Caught Up on Rent

The trends in the graph below are based on questions <u>only asked of Arizona renters not caught up on their rent</u>: **6.5% of all AZ renter households – December 1st – 13th**

Source: Census Household Pulse Survey –Weeks 22 – 40
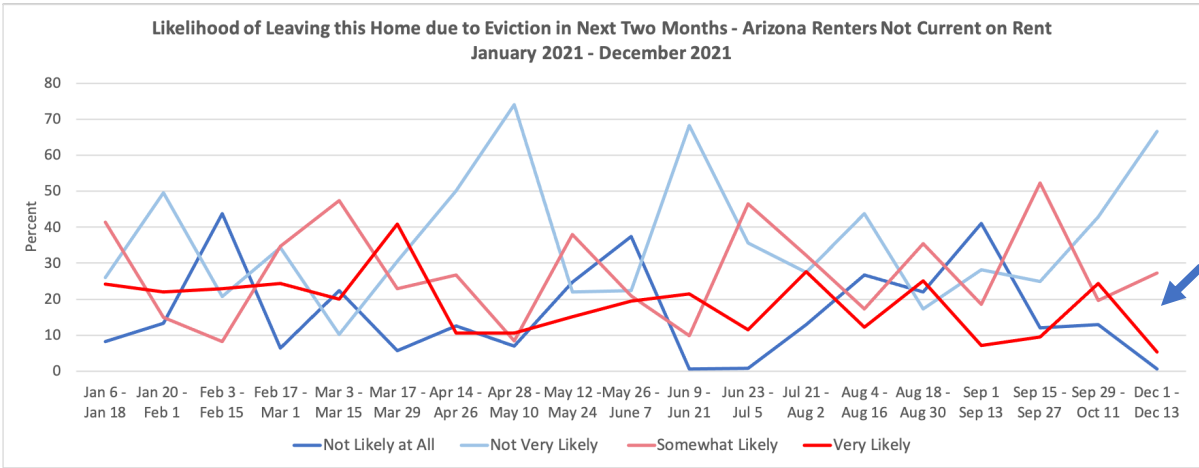
Substantial improvement in the share reporting that they view eviction as "very likely" relative to last wave.

Likelihood of Leaving this Home due to Eviction in Next 2 Months
Arizona Renters Not Current on Rent - Sept 29 - Oct 11

Very Likely	24%	
Somewhat Likely	20%	
Not Very Likely	43%	
Not Likely at All	13%	

Likelihood of Leaving this Home due to Eviction in Next 2 Months
Arizona Renters Not Current on Rent - Dec 1 - 13

Very Likely	5%	
Somewhat Likely	27%	
Not Very Likely	67%	
Not Likely at All	1%	

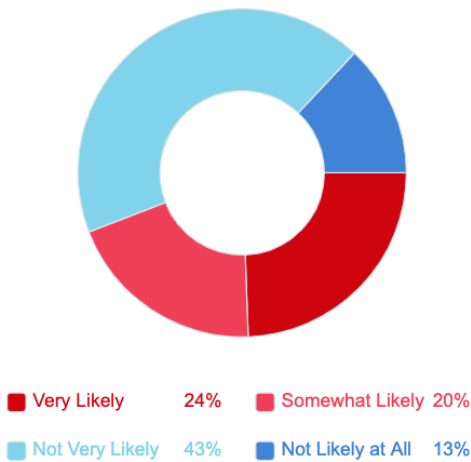# Indicators of the Scope of the Problem: Months Behind on Rent and Rental Assistance

The following graph display responses to questions <u>only asked of Arizona renters not caught up on their rent</u>: **6.5% of all AZ renter households – December 1ˢᵗ – 13ᵗʰ**
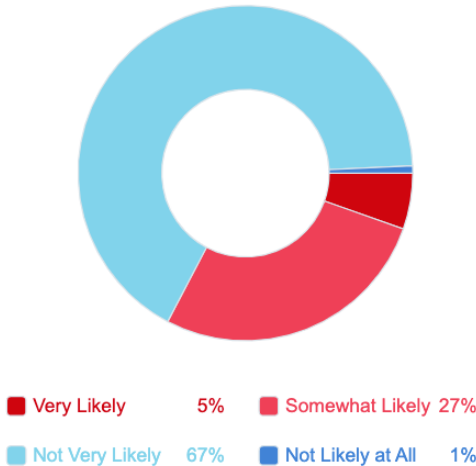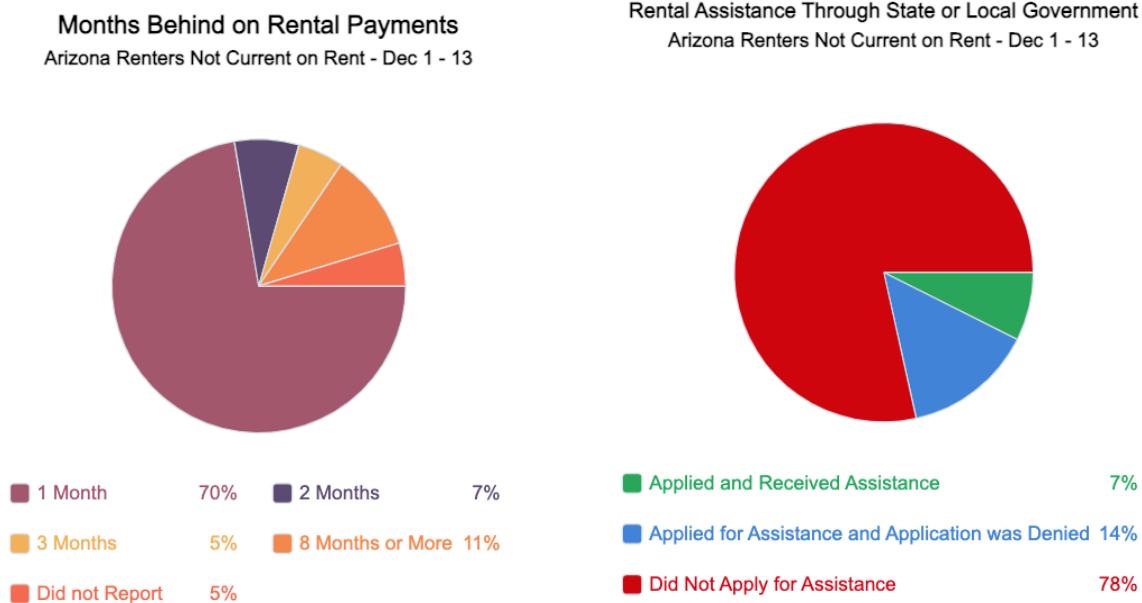
Months Behind on Rental Payments
Arizona Renters Not Current on Rent - Dec 1 - 13

■ 1 Month	70%	■ 2 Months	7%
■ 3 Months	5%	■ 8 Months or More	11%
■ Did not Report	5%		

Rental Assistance Through State or Local Government
Arizona Renters Not Current on Rent - Dec 1 - 13

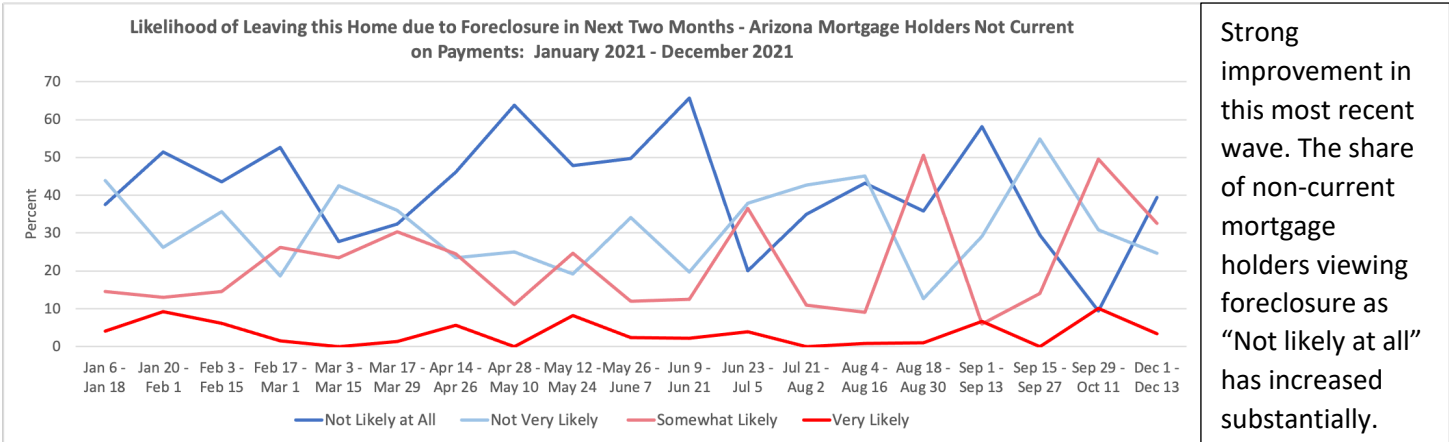|	
■ Applied and Received Assistance	7%
■ Applied for Assistance and Application was Denied	14%
■ Did Not Apply for Assistance	78%

Consistent with previous survey waves, this most recent survey indicates that the majority of Arizona renters who are behind on their rent, 77%, 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 fell from 35% of non-current renters in the last wave in early October to 11% in early December. This is great news and indicates substantial improvement in the financial positions of Arizona renters.

Turning to application and receipt of rental assistance, 7% of non-current renter households report having applied and received rental assistance. Most noteworthy is the fact that the vast majority of non-current rental households in Arizona have not applied for assistance (78%). This suggests enormous potential benefit to outreach and promotion efforts in regards to the availability of rental assistance.

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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 <u>only asked of Arizona mortgage holders not caught up on their payments</u>: **8.3% of all AZ mortgage holding households – Dec 1st - 13th**

Strong improvement in this most recent wave. The share of non-current mortgage holders viewing foreclosure as "Not likely at all" has increased substantially.

Source: Census Household Pulse Survey –Weeks 22 – 40

Likelihood of Leaving this Home due to Foreclosure in Next Two Months - Arizona Mortgage Holders - Sept 29 - Oct 11
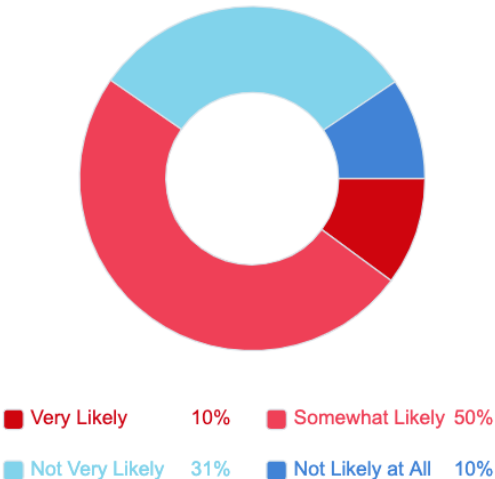
■ Very Likely 10%	■ Somewhat Likely 50%
■ Not Very Likely 31%	■ Not Likely at All 10%

Likelihood of Leaving this Home due to Foreclosure in Next Two Months - Arizona Mortgage Holders - Dec 1 - 13

■ Very Likely 3%	■ Somewhat Likely 33%
■ Not Very Likely 25%	■ Not Likely at All 39%
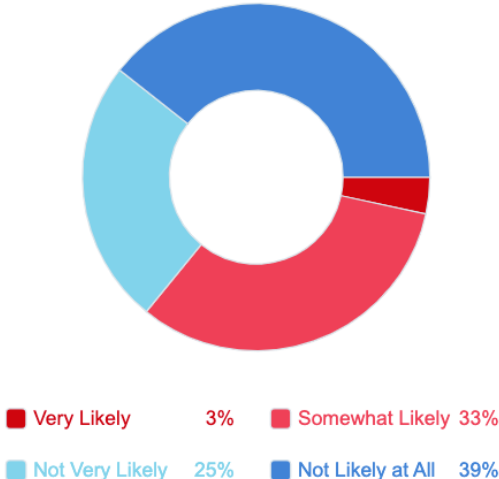
Indicators of the Scope of the Problem: Estimates of Rental Shortfall– ARIZONA

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 39 of the survey conducted September 29th - October 11th 2021. The percentage of renters not current statewide in Wave 39 was 11.8%.

National Equity Atlas – Estimates based on Wave 39 of the Census HPS

Estimated Number of Arizona Households Behind on Rent	Estimated Total Rental Debt Statewide	Estimated Rental Debt per Household
78,000	$197.6 million	$2,500

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 39 of the Census Household Pulse survey conducted September 29th - October 11th 2021.

National Equity Atlas – Estimates based on Wave 39 of the Census HPS

Estimated Number of Pima County Households Behind on Rent	Estimated Total Rental Debt Countywide	Estimated Rental Debt per Household
11,030	$24.0 million	$2,200

"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 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 <u>could emerge depending on the extend of the ameliorative impacts of forthcoming relief assistance (unemployment insurance, stimulus checks, rental assistance, & etc).</u> Please do not cite or distribute these figures without these caveats and without checking with the author first.**

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	78,000	10% result in displacement: 7,800	20,982	5,246	2,098
Renters not Current	78,000	20% result in displacement: 15,600	41,964	10,491	4,196

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 39 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 40 conducted December 1st- 13th, 6.5% 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.

6.5% of 927,771 = 60,305 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. 5.4% of these households that are not current on their rent reported being "very likely" to be evicted, while another 27.3% said this is "somewhat likely".

5.4% of 60,305 = 3,257 AZ renter households who think it is "very likely" that they will be evicted in the next two months.

32.7% of 60,305 = 19,720 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 10% of the Arizona renter households not current on their payments being at risk of a potential housing displacement (roughly 8k 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 forthcoming 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 <u>could emerge depending on the extend of the ameliorative impacts of forthcoming relief assistance (unemployment insurance, stimulus checks, rental assistance, & etc).</u>**

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	11,030	10% result in displacement: 1,103	2,967	742	297
Renters not Current	11,030	20% result in displacement: 2,206	5,934	1,484	593

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 39 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 40 conducted December 1st- 13th 2021, 6.5% 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.

6.5% of 151,943 = 9,876 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. 5.4% of these households that are not current on their rent reported being "very likely" to be evicted, while another 27.3% said this is "somewhat likely".

5.4% of 9,876 = 533 Pima County renter households who think it is "very likely" that they will be evicted in the next two months.

32.7% of 9,876 = 3,230 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 10% of Pima County renter households not current on their payments being at risk of a potential housing displacement (roughly 1,100 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 forthcoming 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. Numbers for recent months indicate a concerning increase in both eviction filings and writs issued.

Total Eviction Filings & Writs Issued
Pima County 2021

Eviction Filings and Writs Issued by Week
Pima County - August 2nd to October 15th 2021
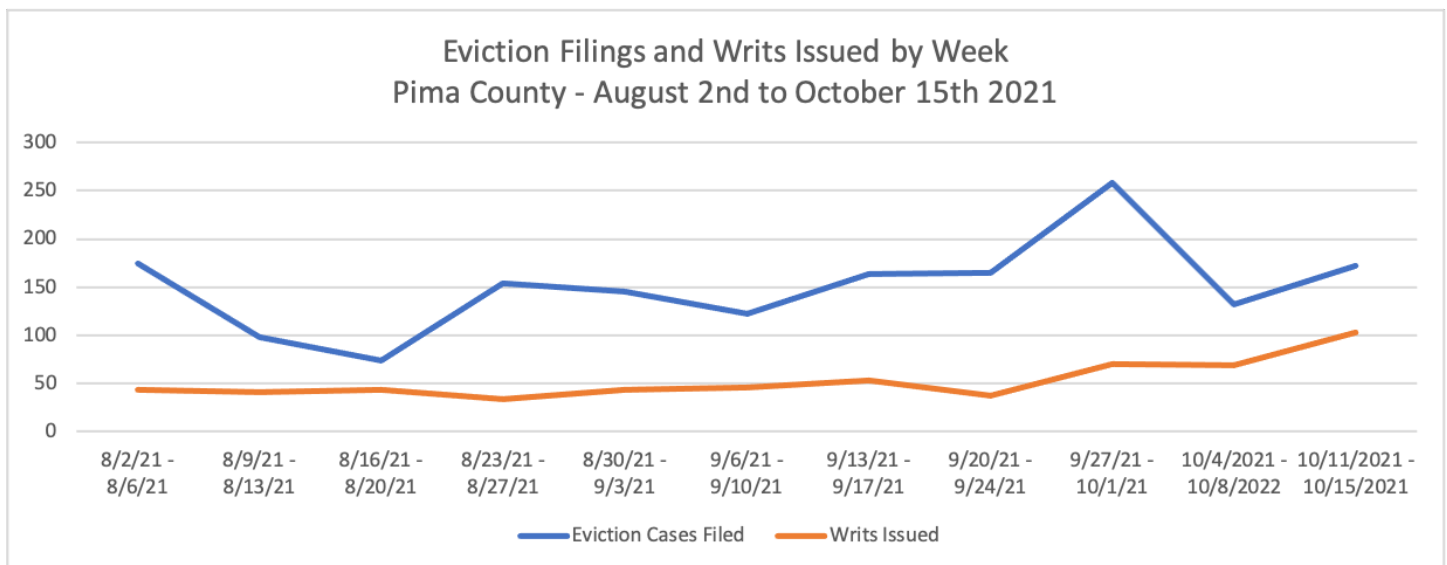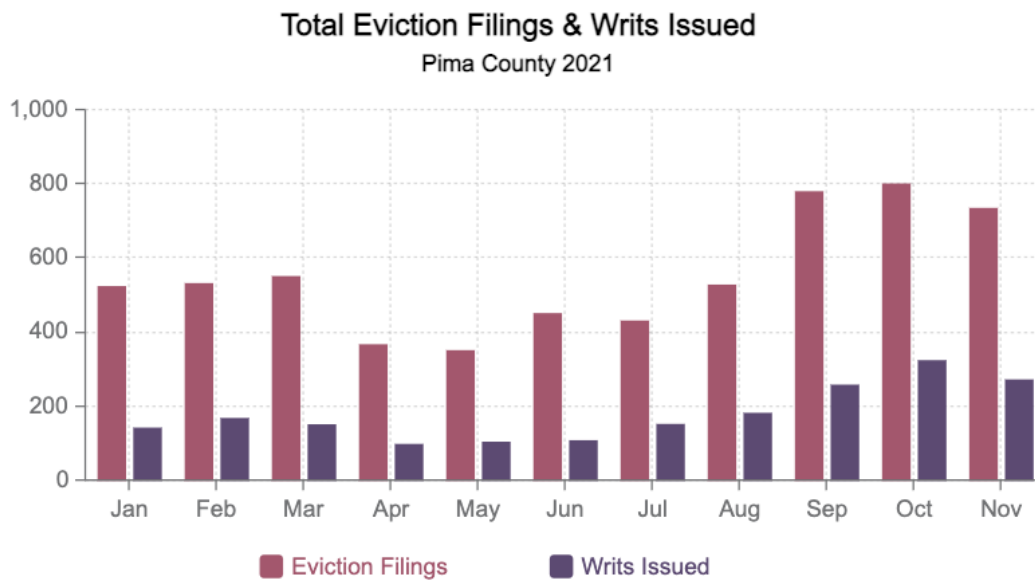
Source: Derek M. Zenner, Court Operations Analyst, Pima County Consolidated Justice Court

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.
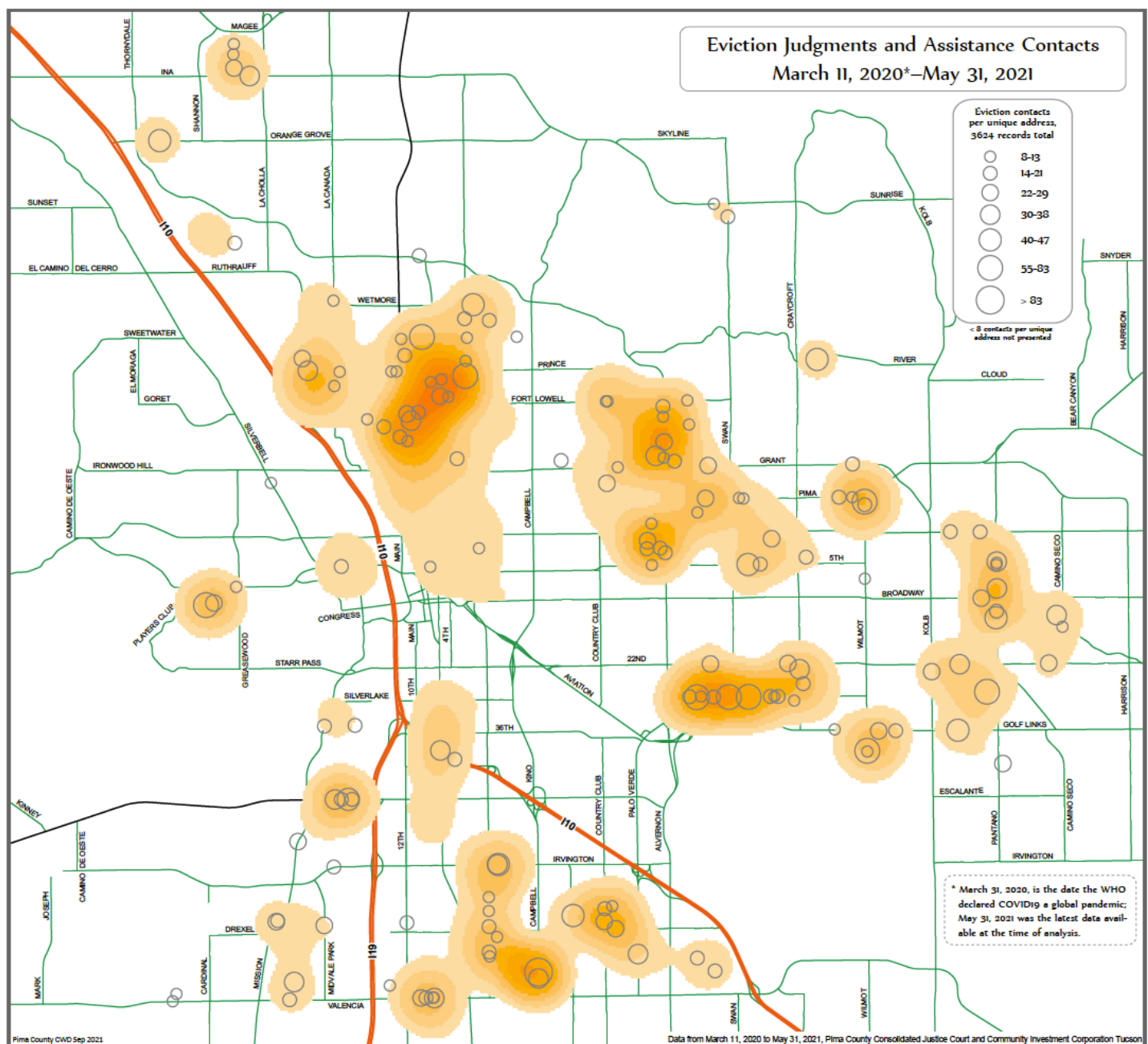
Source: Joel Viers, Pima County

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 current 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.

Percent Job Losses in Post WWII Recessions

Legend: —1948 —1953 —1957 —1960 —1969 —1974 —1980 —1981 —1990 —2001 —2007 —2020

December 2021

2007 Employment Recession

2020 Employment Recession

Y-axis: Percent Job Losses Relative to Peak Employment Month (1.0% to -15.0%)

X-axis: Number of Months After Peak Employment (0 to 92) http://www.calculatedriskblog.com/
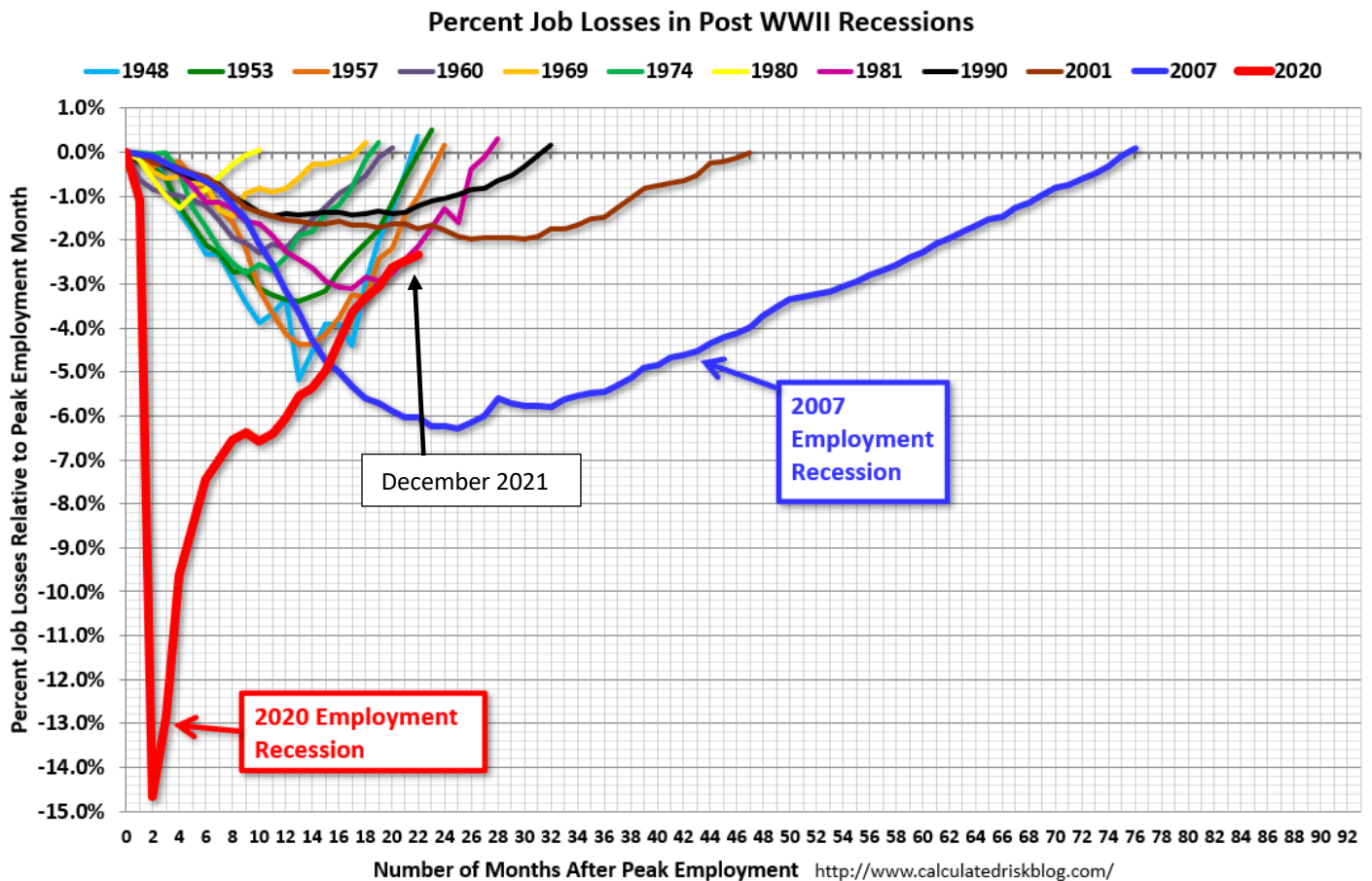
Source: Calculated Risk Finance & Economics

Arizona Initial Claims for Unemployment Insurance and Pandemic Assistance

Initial Claims for Pandemic Assistance
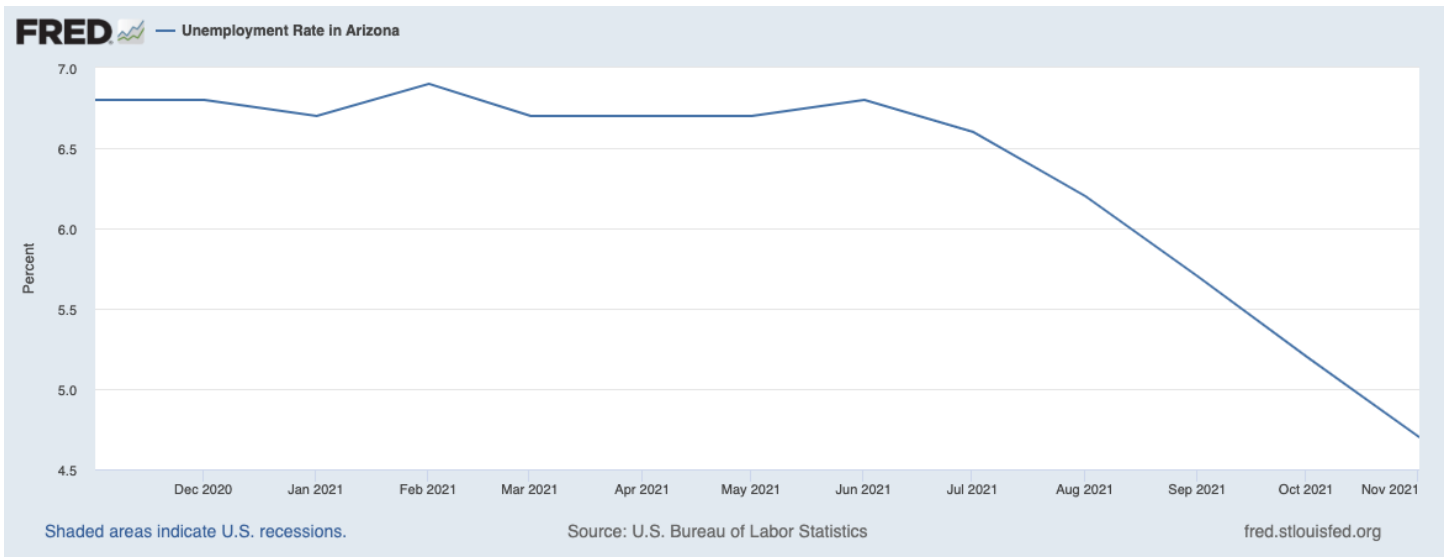Initial Claims for Unemployment Insurance
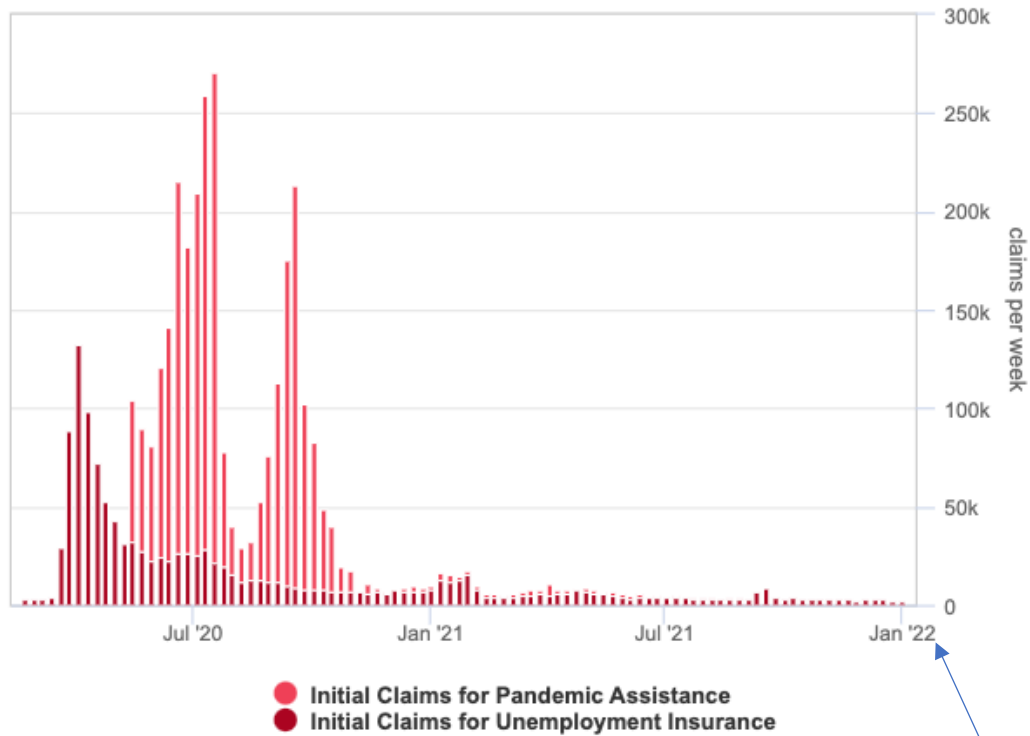
Published by Economic and Business Research Center.
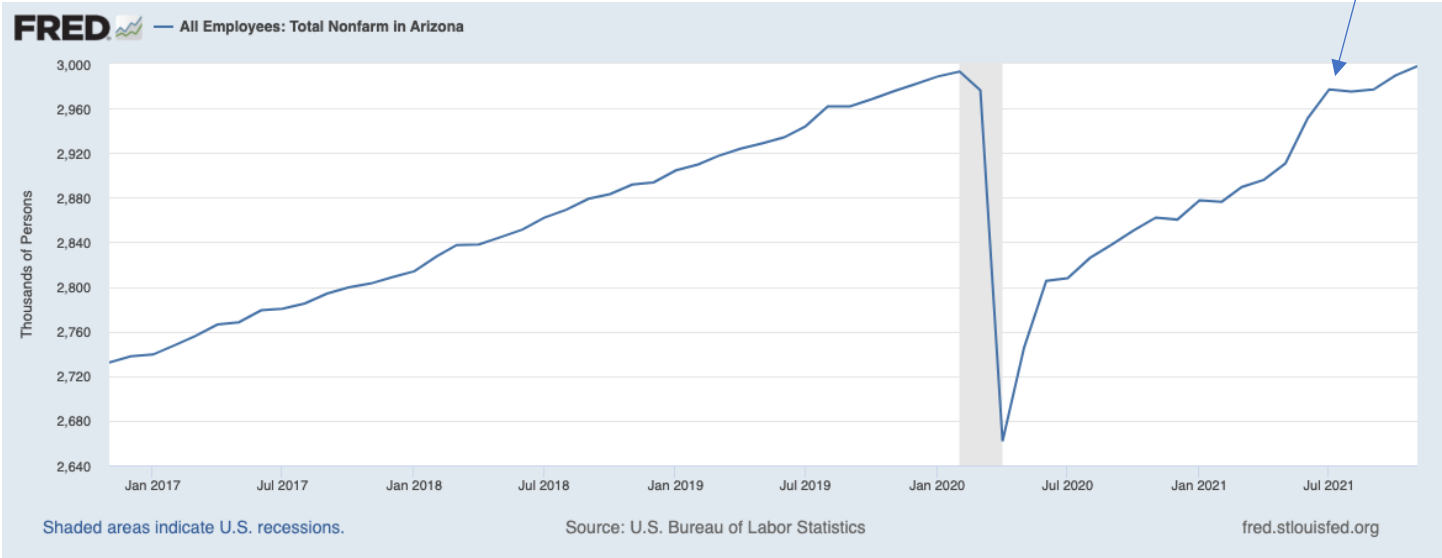
Source: UA Economic and Business Resource Center

Week of January 1st

Arizona Unemployment Rate

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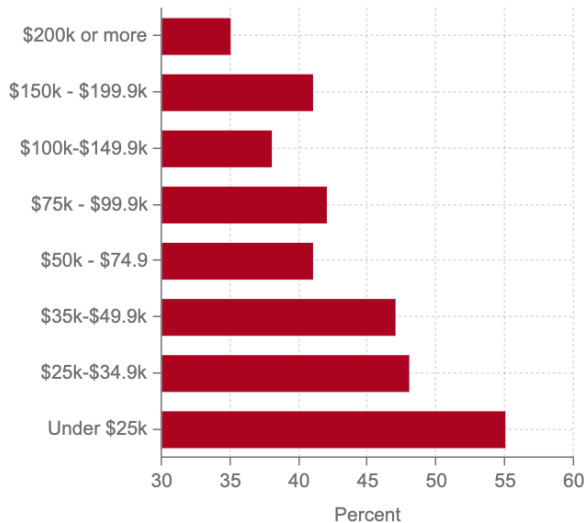COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES
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Total Nonfarm Employment Arizona

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

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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.

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

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

Households with children began receiving Child Tax Credit payments between these two waves.
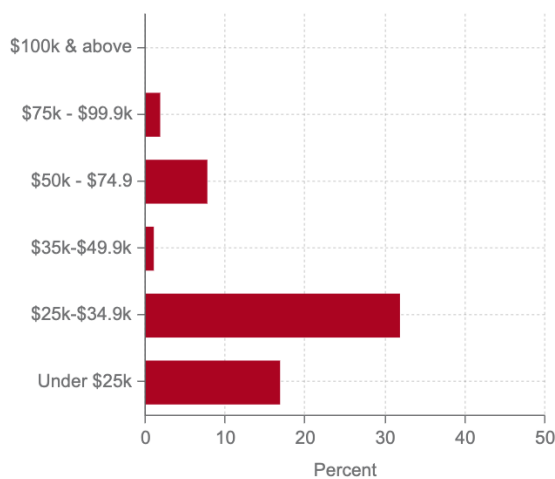
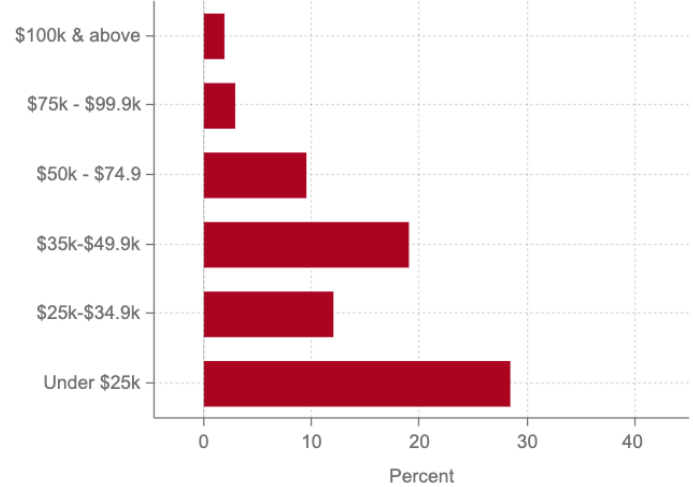*Source: Census HPS Week 33 –June 23rd– July 5th 2021.*
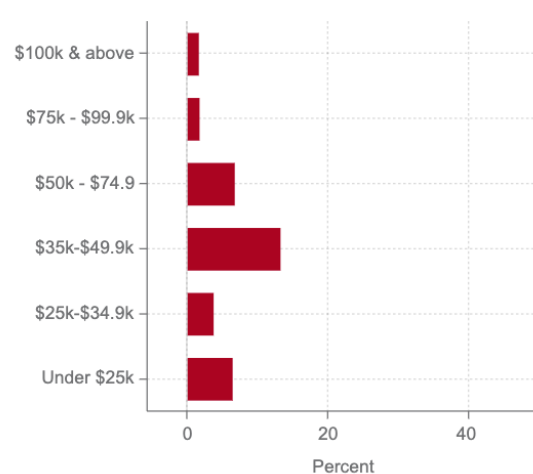
Census HPS Week 40 –Dec 1st – 13th 2021.

Households Finding it Very Difficult to Meet Usual Expenses
ARIZONA Households by Income - Sept 29 - Oct 11
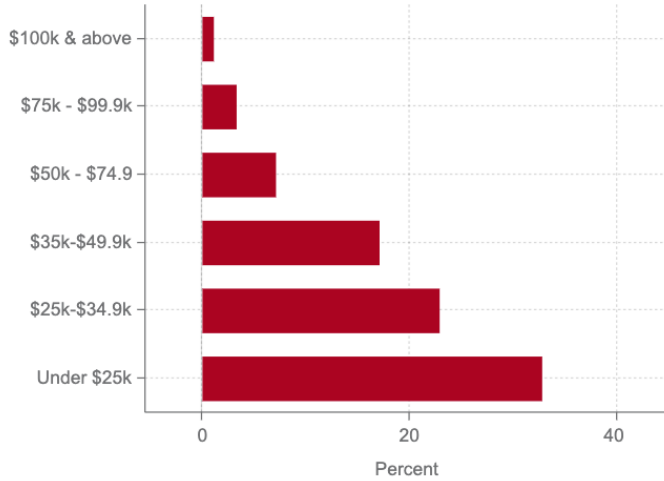
Households Finding it Very Difficult to Meet Usual Expenses
ARIZONA Households by Income - December 1 - 13

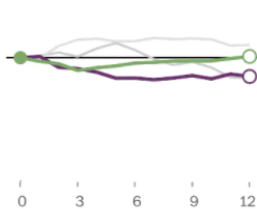*Source: Census Household Pulse Survey –Week 39*　　　　*Census Household Pulse Survey –Week 40*

The coronavirus crisis is different

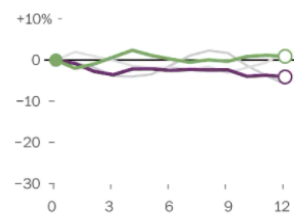Job growth (or loss) since each recession began, based on weekly earnings

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.

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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.
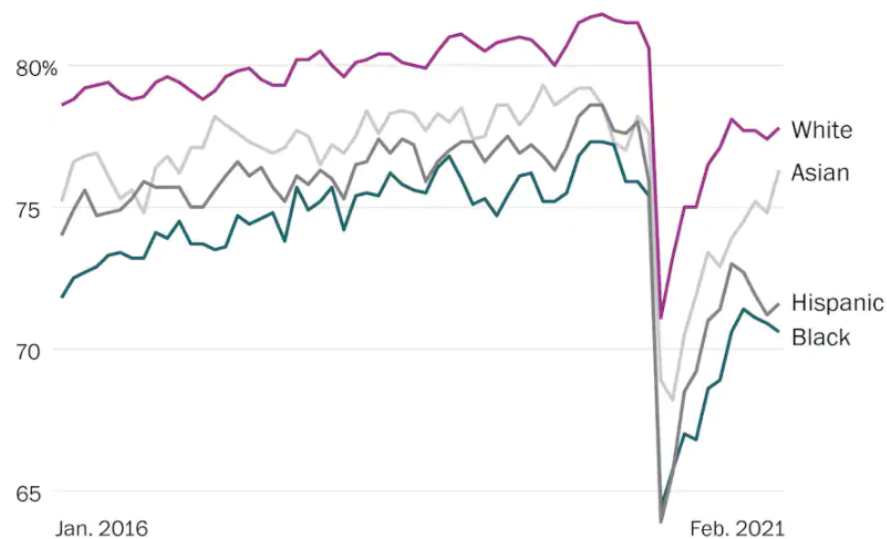
Experienced Loss of Employment Income Since March 13, 2020
ARIZONA by Race/Ethnicity
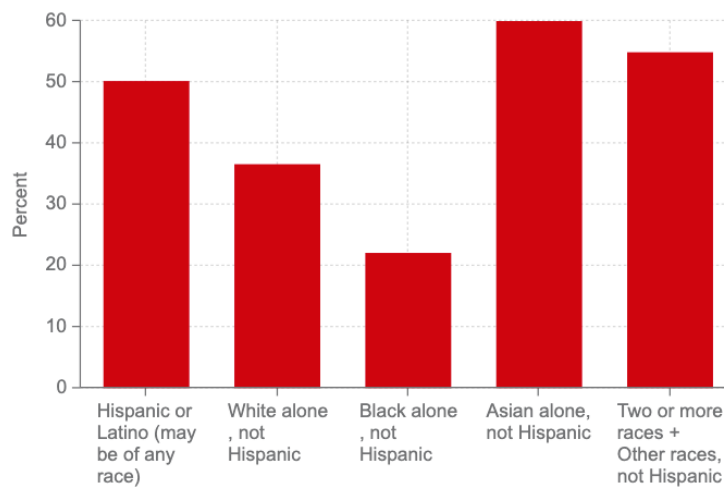
Source: Census Household Pulse Survey –Week 26 – March 3ʳᵈ – 15ᵗʰ 2021

Share of prime-age adults who have jobs

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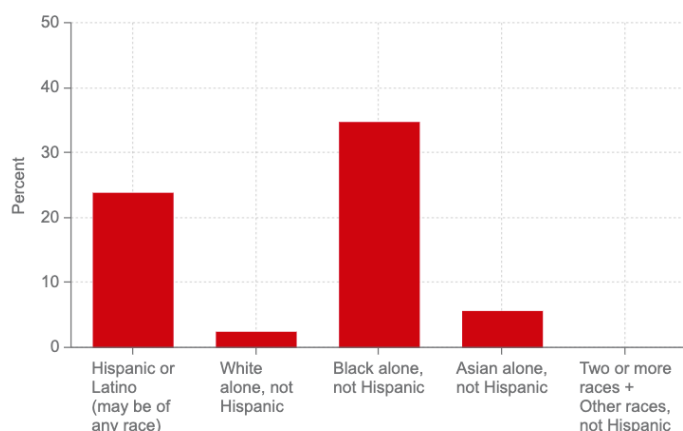

Source: Labor Department   THE WASHINGTON POST

Source: Siegel, R. "The soft underbelly to a looming economic boom: Millions will miss out." Washington Post. March 30 2021.
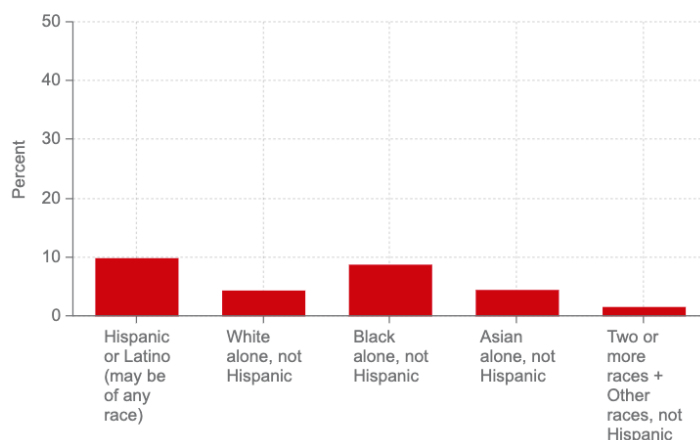
Percent Not Current on Rent by Race/Ethnicity
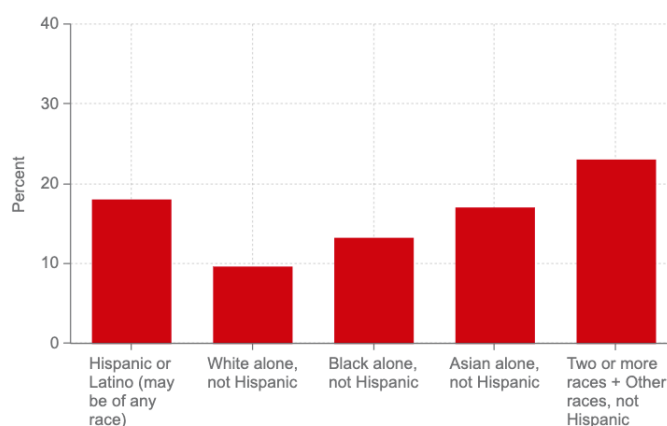Arizona Renter Households - Sept 29 - Oct 11 2021

Percent Not Current on Rent by Race/Ethnicity
ARIZONA Renter Households - December 1 - 13 2021

Source: Census Household Pulse Survey –Week 39   *Census Household Pulse Survey –Week 40*

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

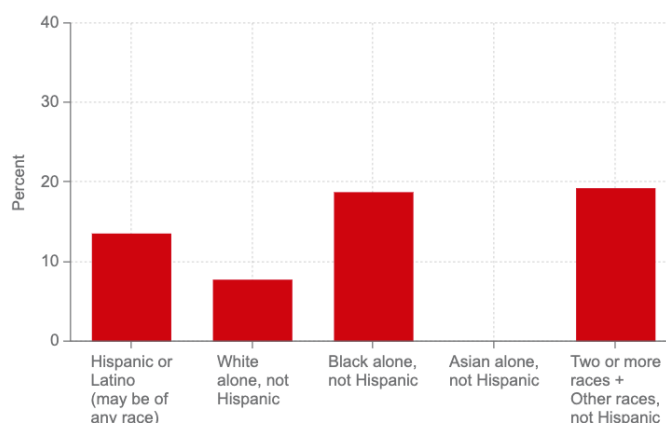*Source: Census Household Pulse Survey –Week 26*

"Very Difficult" to Pay Usual Expenses in Last Week
Arizona Households - Sept 29 - Oct 11 2021
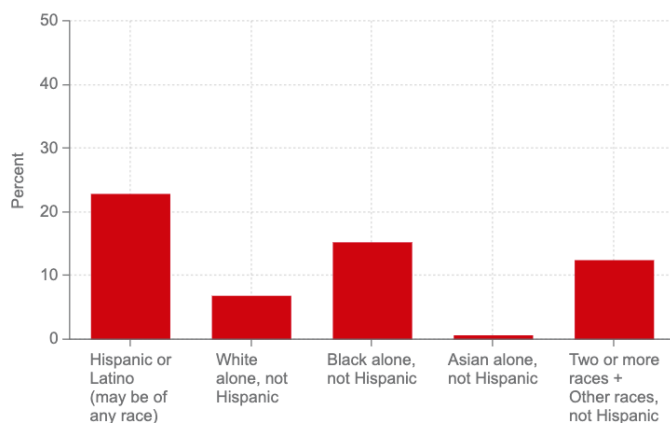
"Very Difficult" to Pay Usual Expenses in Last Week
ARIZONA Renter Households - December 1 - 13 2021

Source: Census Household Pulse Survey –Week 39   *Census Household Pulse Survey –Week 40*

Appendix: National Equity Atlas Rent Debt Methodology[1]

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

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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.