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 45 Census Household Pulse
Survey Data – June 5th 2022

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Suggested reference: Bentele, K. (2022). *Housing Insecurity Indicators and Homelessness Estimates for Arizona and Pima County – 33rd Report.* Tucson, AZ: University of Arizona, Southwest Institute for Research on Women.

CONTENTS

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 steadily, but factors like inflation and substantial increases in rents are undermining the benefits of this growth. 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 most economic indicators suggest that this has largely not been the case. In the Census Household Pulse Survey wave, conducted January 26th to February 7th 2022, the proportion of Arizona renters not current was 12.2%. In the most recent wave, conducted April 27th to May 9th 2022, this proportion not current held steady at 5.2% the same as the previous survey wave. This is excellent news. In addition, of those non-current renters the proportion who reported that they were "very likely" to experience an eviction in the next two months remained very low, 6.1%, while the proportion seeing eviction as "not likely at all" more than doubled. This is also excellent news. Among these non-current renters, the vast majority, 70%, are only 1 or 2 months behind on their rent (down from 80% in the previous survey wave). In addition, this survey also contains the largest proportion of non-current renters who reported having applied for and received rental assistance, and the lowest proportion reporting that they have not applied for assistance in this survey to date. This suggests that non-current renters in Arizona have been more active in pursuing and more successful in receiving rental assistance in recent weeks. Confidence in ability to pay next month's rent among Arizona renters remained stable relative to the last survey wave. Arizona mortgage holders are also doing very well, with recent improvements holding steady.

Overall, the news this wave is very good. A few indicators of concern are worth noting. Individuals (nationwide) 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) are not benefiting from the improving economy as quickly on average as other demographic groups. Last, the number of eviction filings in Pima County hit a pandemic-era peak in January with 1077 filings, followed by 828 filings in February, 944 filings in March, and 853 in April.

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
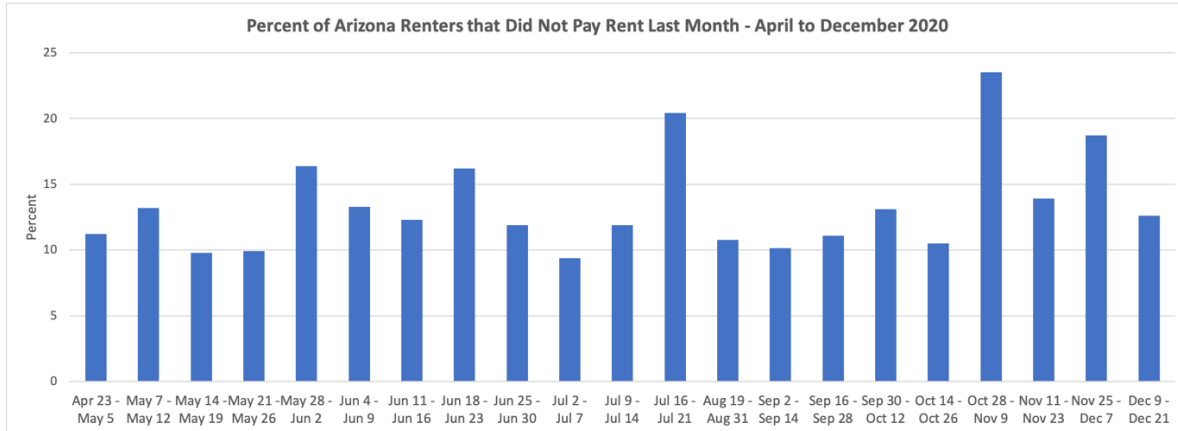
Source: Census Household Pulse Surveys Weeks 1-21

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

This orange line is the three-wave moving average of renters not current.
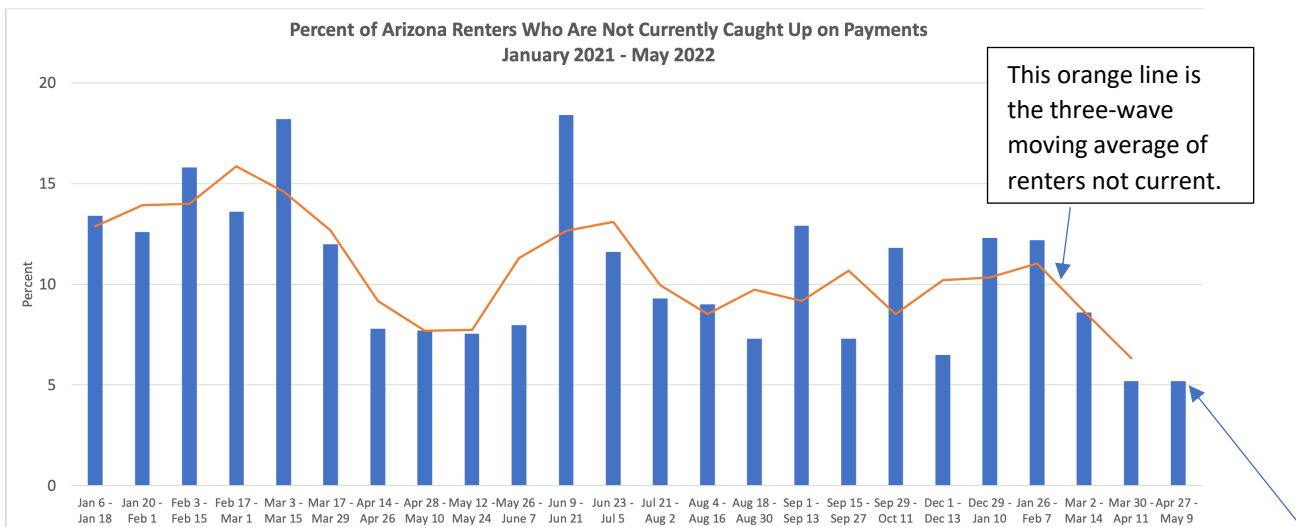
Source: Census Household Pulse Survey –Weeks 22 – 45

Excellent news! This is the lowest % not current since the survey began in April 2020 & has been consistent across the last two survey waves.

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 - May 2022

This orange line is the three-wave moving average of mortgage holders not caught up on payments.
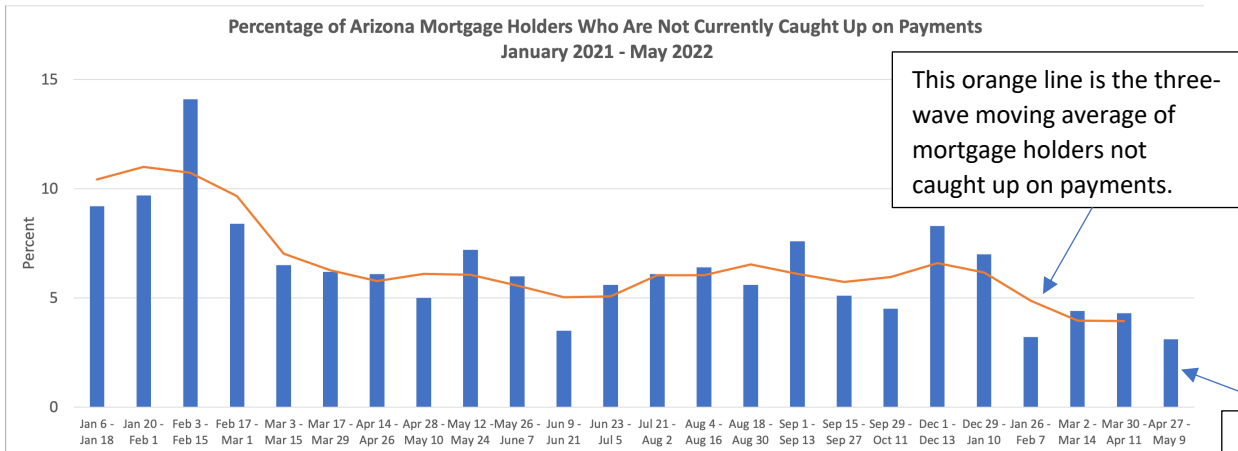
The % of mortgage holders not current captured in this survey (3.1%) is lowest in this survey to date. Excellent news!

Source: Census Household Pulse Survey –Weeks 22 – 45

65%
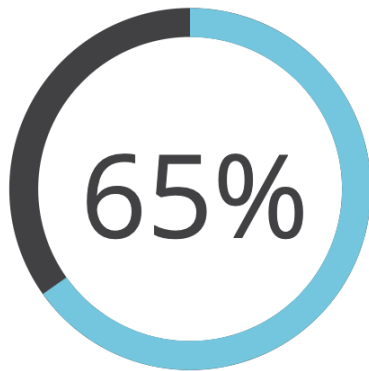
Homeownership Rate in Arizona in 2021

Source: U.S. Census Bureau

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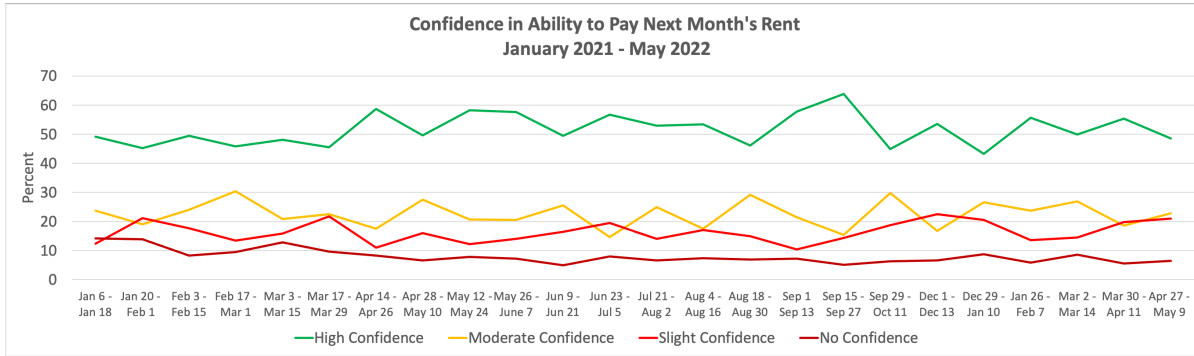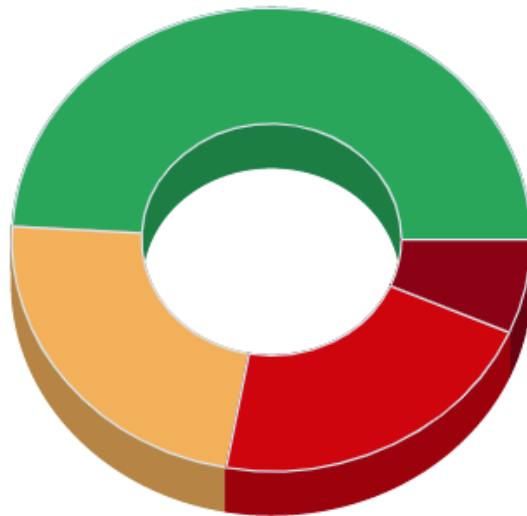

Source: Census Household Pulse Survey –Weeks 22 – 45

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>: **5.2% of all AZ renter households – April 27ᵗʰ- May 9ᵗʰ 2022.**

Source: Census Household Pulse Survey –Weeks 22 – 45
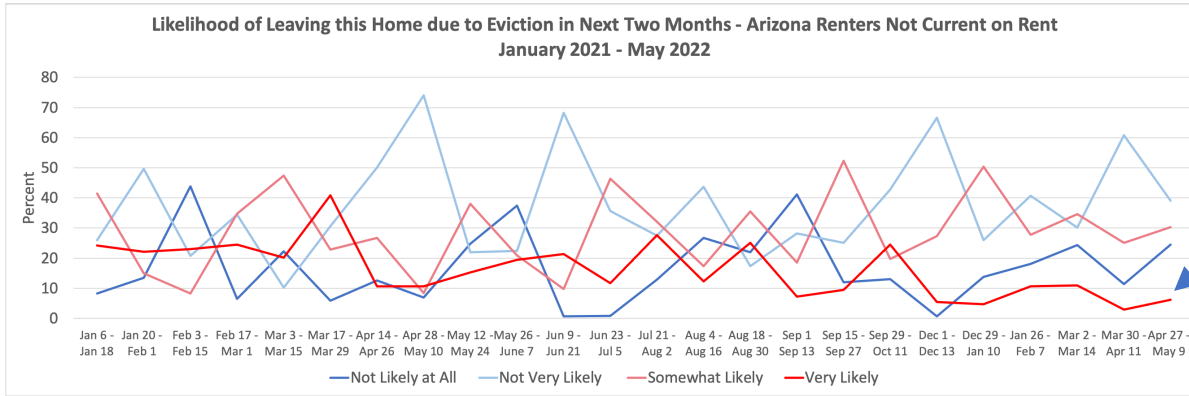
The proportion seeing eviction as "very likely" remains very low and % seeing eviction as "Not Likely at All" more than doubled relative to last wave. Great news!

Likelihood of Leaving this Home due to Eviction in Next 2 Months
Arizona Renters Not Current on Rent - Mar 30 - Apr 11 2022

Likelihood of Leaving this Home due to Eviction in Next 2 Months
Arizona Renters Not Current on Rent - Apr 27 - May 9 2022

Mar 30 - Apr 11 2022		Apr 27 - May 9 2022	
Very Likely	3%	Very Likely	6%
Somewhat Likely	25%	Somewhat Likely	30%
Not Very Likely	61%	Not Very Likely	39%
Not Likely at All	11%	Not Likely at All	25%

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>: **5.2% of all AZ renter households – April 27th- May 9th 2022.**
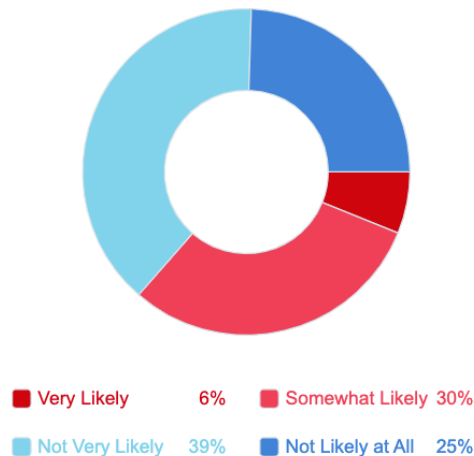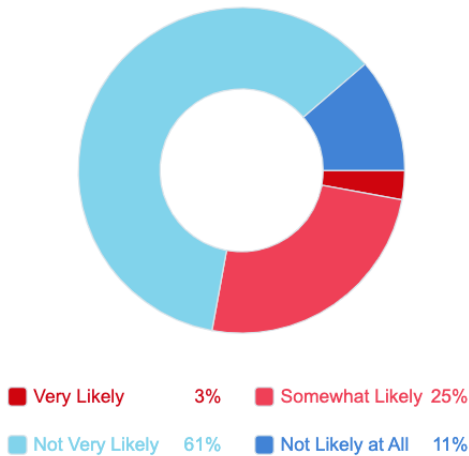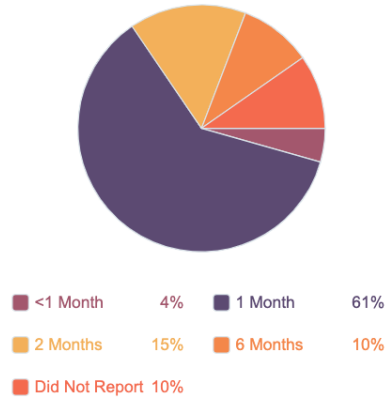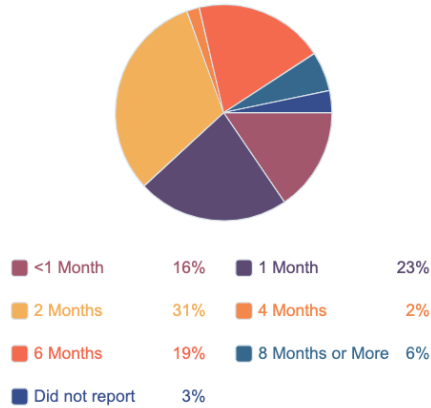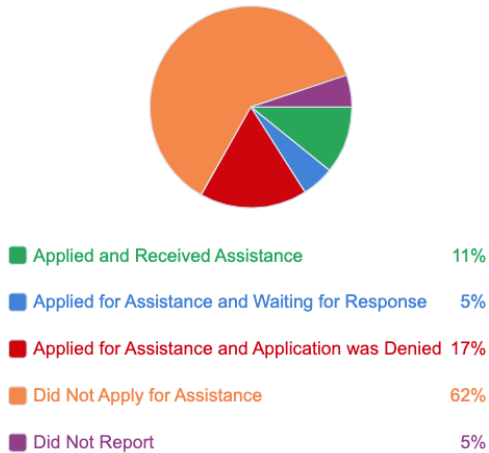
Months Behind on Rental Payments
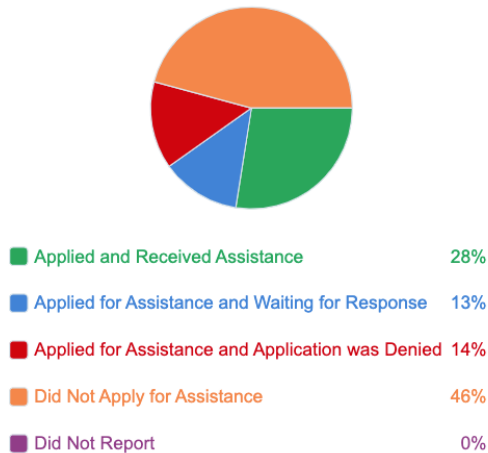Arizona Renters Not Current on Rent - Mar 30 - Apr 11 2022

■ <1 Month	4%	■ 1 Month	61%
■ 2 Months	15%	■ 6 Months	10%
■ Did Not Report	10%		

Months Behind on Rental Payments
Arizona Renters Not Current on Rent - Apr 27 - May 9 2022

■ <1 Month	16%	■ 1 Month	23%
■ 2 Months	31%	■ 4 Months	2%
■ 6 Months	19%	■ 8 Months or More	6%
■ Did not report	3%		

Rental Assistance Through State or Local Government
Arizona Renters Not Current on Rent - Mar 30 - Apr 11 2022

■ Applied and Received Assistance	11%
■ Applied for Assistance and Waiting for Response	5%
■ Applied for Assistance and Application was Denied	17%
■ Did Not Apply for Assistance	62%
■ Did Not Report	5%

Rental Assistance Through State or Local Government
Arizona Renters Not Current on Rent - Apr 27 - May 9 2022

■ Applied and Received Assistance	28%
■ Applied for Assistance and Waiting for Response	13%
■ Applied for Assistance and Application was Denied	14%
■ Did Not Apply for Assistance	46%
■ Did Not Report	0%

This survey indicates that the majority of Arizona renters who are behind on their rent, 70%, are only 1 or 2 months behind on their payments. This is a slight erosion relative to the previous survey wave where this proportion was 80% of non-current AZ renters. This most recent survey also captured modest growth in the proportions of non-current renters who are 6 months or 8 months or more behind on rent. In addition, this survey also contains the largest proportion of non-current renters who reported having applied for and received rental assistance, and the lowest proportion reporting that they have not applied for assistance in this survey to date. This suggests that non-current renters in Arizona have been more active in pursuing and more successful in receiving rental assistance in recent weeks. This is great news.

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>: **3.1% of all AZ mortgage holding households – April 27th- May 9th 2022.**

Source: Census Household Pulse Survey –Weeks 22 – 45
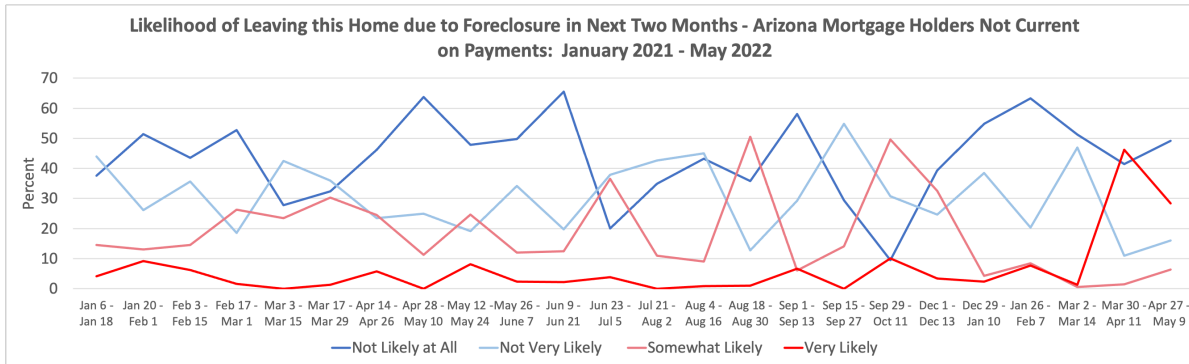
The two most recent surveys waves indicate that among the declining share of mortgage holders who are not current on payments, the share reporting that foreclosure is "Very Likely" has increased dramatically.

Likelihood of Leaving this Home due to Foreclosure in Next Two Months - Arizona Mortgage Holders - Mar 30 - Apr 11 2022

Very Likely	46%
Somewhat Likely	1%
Not Very Likely	11%
Not Likely at All	41%

Likelihood of Leaving this Home due to Foreclosure in Next Two Months - Arizona Mortgage Holders - Apr 27 - May 9 2022

Very Likely	28%
Somewhat Likely	6%
Not Very Likely	16%
Not Likely at All	49%
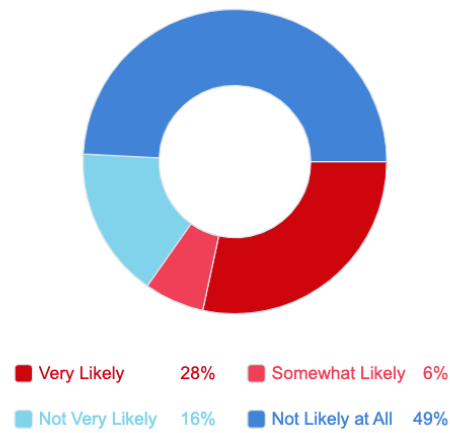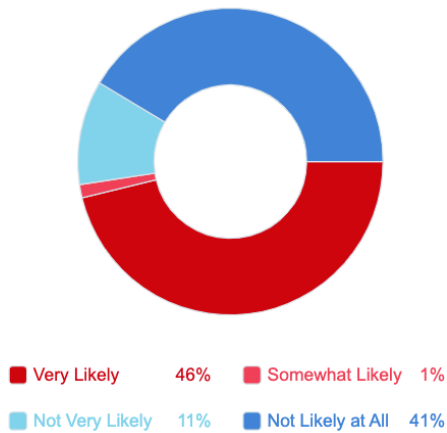
Indicators of the Scope of the Problem: Estimates of Rental Shortfall– ARIZONA

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 45 of the survey conducted April 27th – May 9th 2022.

National Equity Atlas – Estimates based on Wave 45 of the Census HPS

Estimated Number of Arizona Households Behind on Rent	Estimated Total Rental Debt Statewide	Estimated Rental Debt per Household
66,000	$123.4 million	$1,900

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 45 of the Census Household Pulse survey conducted April 27th – May 9th 2022.

National Equity Atlas – Estimates based on Wave 45 of the Census HPS

Estimated Number of Pima County Households Behind on Rent	Estimated Total Rental Debt Countywide	Estimated Rental Debt per Household
12,270	$24.4 million	$2,000

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"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	66,000	10% result in displacement: 6,600	17,754	4,439	1,775
Renters not Current	66,000	20% result in displacement: 13,200	35,508	8,877	3,551

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 (rental assistance, & etc).</u> Please do not cite or distribute these figures without these caveats and without checking with the author first. See next page for additional caveats.**

These National Equity Atlas estimates from early-April 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 45 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 45 conducted April 27th- May 9th 2022, 5.2% 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.

5.2% of 927,771 = 48,244 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. 6.1% of these households that are not current on their rent reported being "very likely" to be evicted, while another 30.3% said this is "somewhat likely".

6.1% of 48,244 = 2,943 AZ renter households who think it is "very likely" that they will be evicted in the next two months.

36.4% of 48,244 = 17,561 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 7k rental households) may be a better estimate of the extent of financial strain among Arizona renters. **To be clear, many 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 <u>could emerge depending on the extend of the ameliorative impacts of forthcoming relief assistance (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	12,270	10% result in displacement: 1,227	3,301	825	330
Renters not Current	12,270	20% result in displacement: 2,454	6,601	1,650	660

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-April 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 45 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 45 conducted April 27th- May 9th 2022, 5.2% 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.

5.2% of 151,943 = 7,901 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. 6.1% of these households that are not current on their rent reported being "very likely" to be evicted, while another 30.3% said this is "somewhat likely".

6.1% of 7,901 = 482 Pima County renter households who think it is "very likely" that they will be evicted in the next two months.

36.4% of 7,901 = 2,876 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 1,200 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 January 2021 to April 2022, by month.
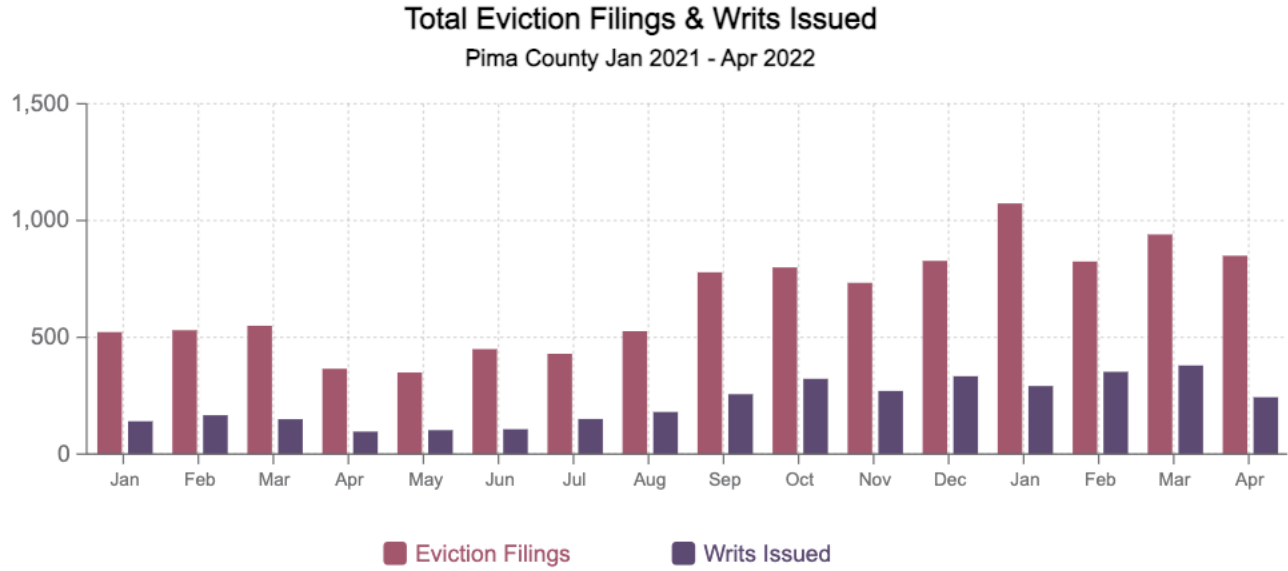

Source: Pima County Consolidated Justice Court

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.
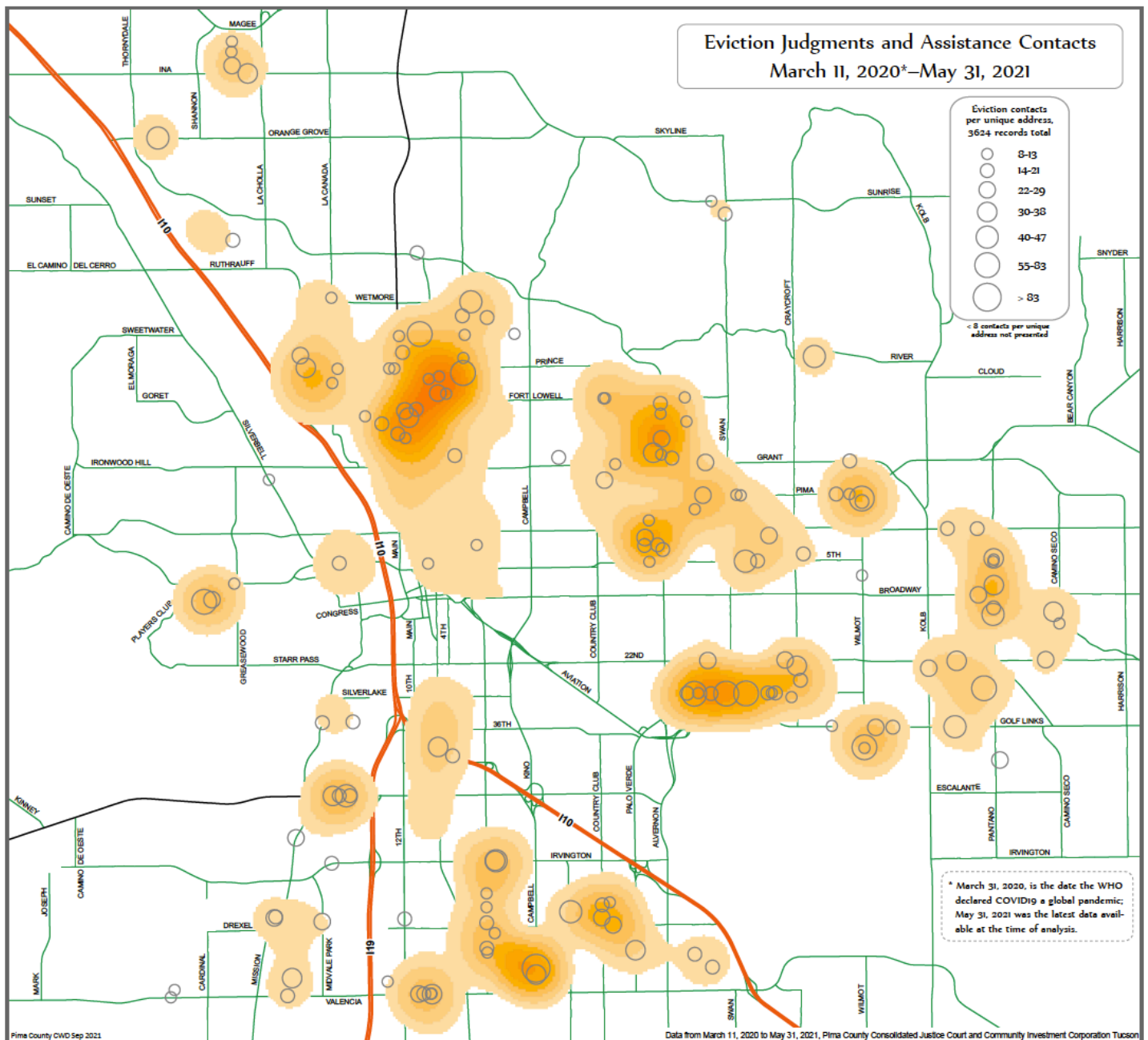
Source: Joel Viers, Pima County

The Road Ahead

We are currently experiencing robust job growth at both the national and state level. In the medium-term, most economists are expecting continuing strong growth and falling unemployment, with the caveat that a new surge in COVID cases may slow this growth (although the recent Omicron wave appears to have had little impact on job 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

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)

May 2022

2007 Employment Recession

2020 Employment Recession

http://www.calculatedriskblog.com/
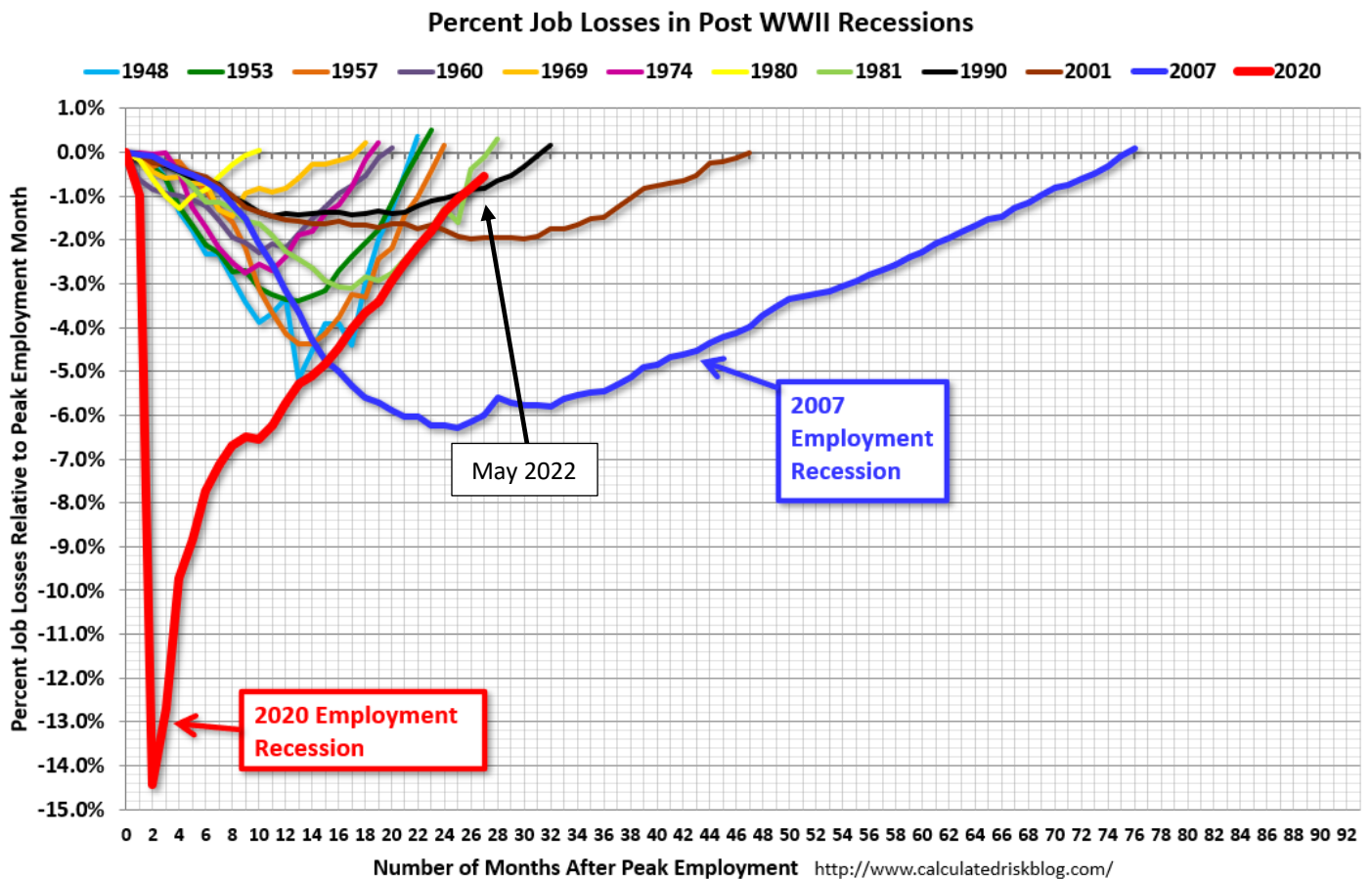
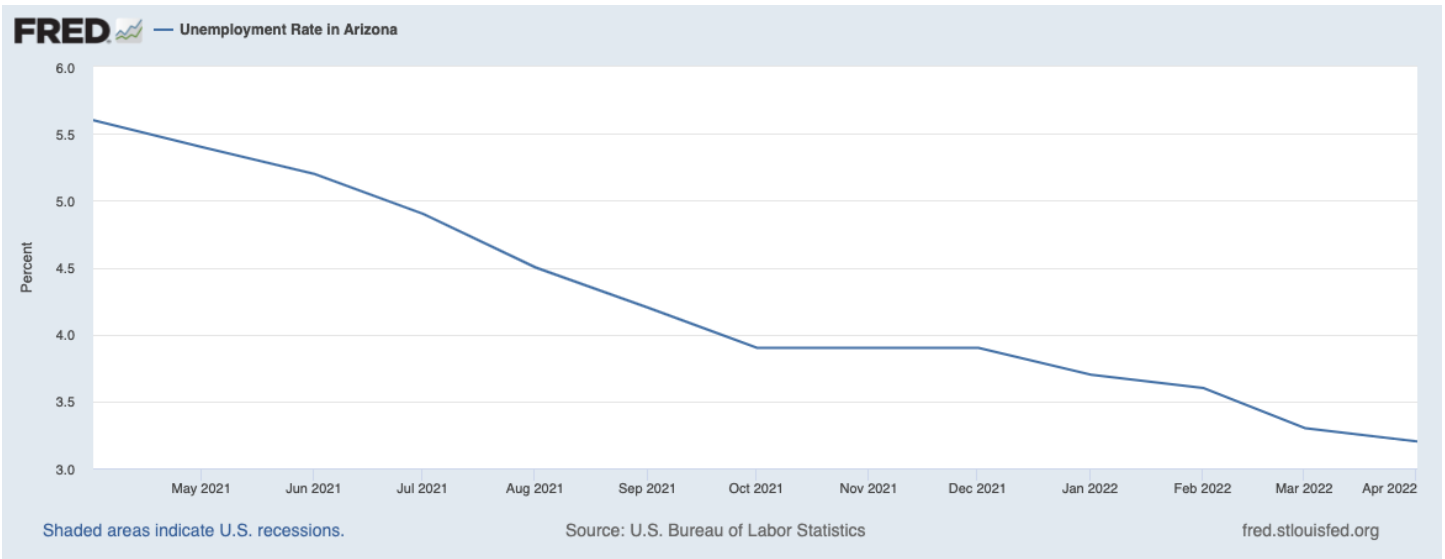*Source: Calculated Risk Finance & Economics*

Arizona Initial Claims for Unemployment Insurance
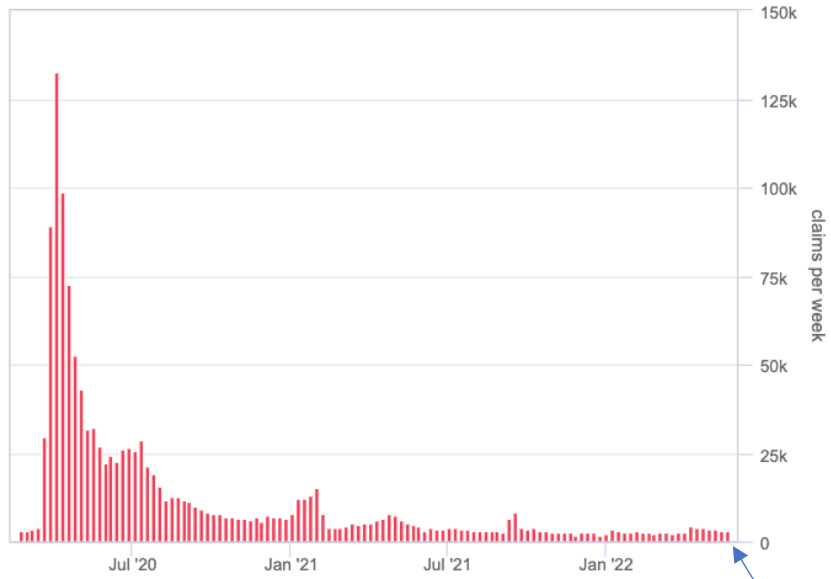
● Initial Claims for Unemployment Insurance

Source: UA Economic and Business Resource Center

Week of May 21st
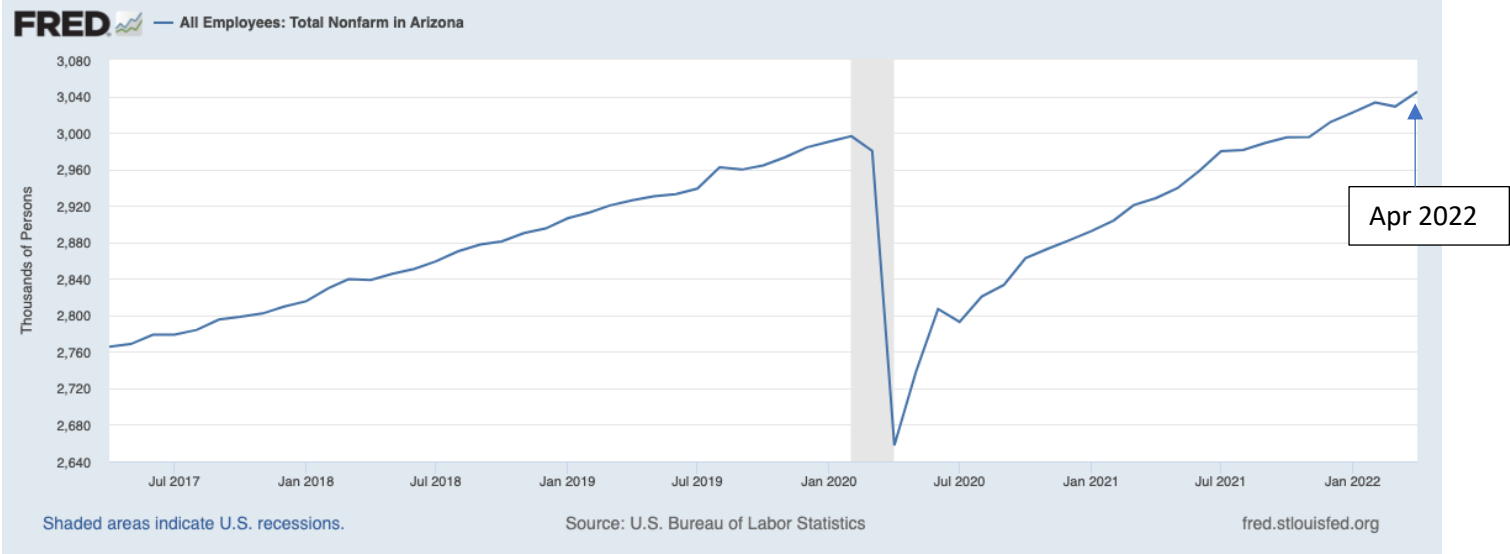
Arizona Unemployment Rate (Seasonally Adjusted)

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Total Nonfarm Employment Arizona

Shaded areas indicate U.S. recessions.   Source: U.S. Bureau of Labor Statistics   fred.stlouisfed.org

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

The % not current for these higher income brackets was not zero, but the number was too small to estimate accurately.
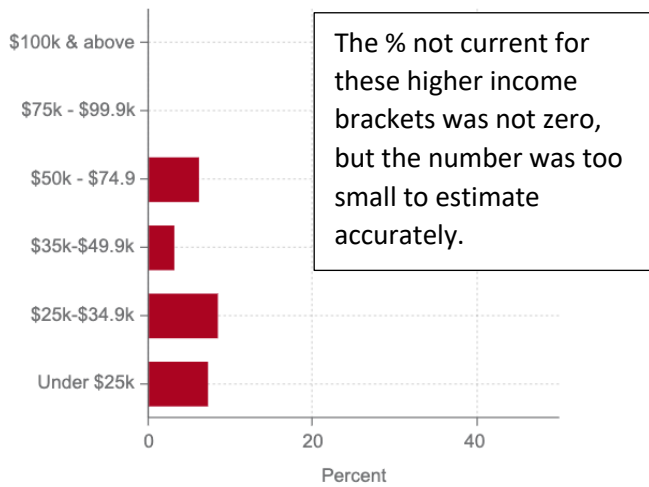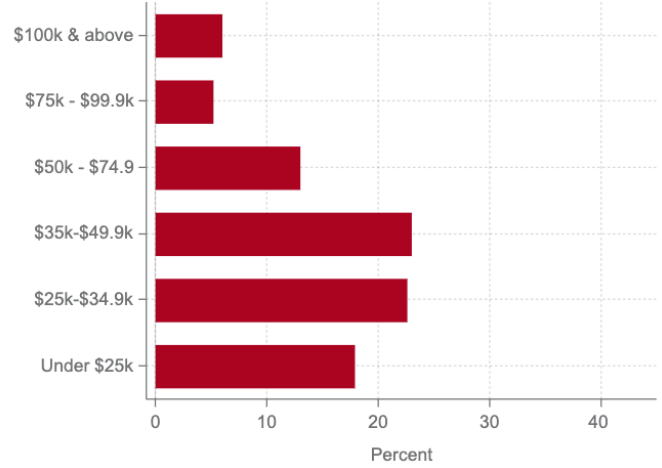
Census HPS Week 44 –March 30th– April 11th 2022.
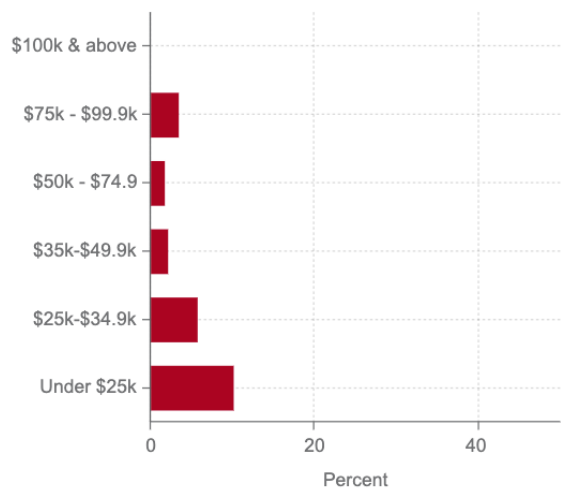
Census HPS Week 45 –April 27th– May 9th 2022.

Households Finding it Very Difficult to Meet Usual Expenses
ARIZONA Households by Income - Mar 30 - Apr 11 2022
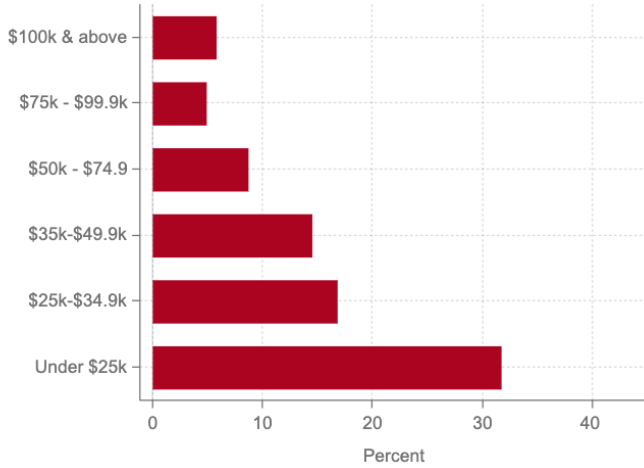
Source: Census Household Pulse Survey –Week 44

Households Finding it Very Difficult to Meet Usual Expenses
ARIZONA Households by Income - Apr 27 - May 9 2022

Census Household Pulse Survey –Week 45

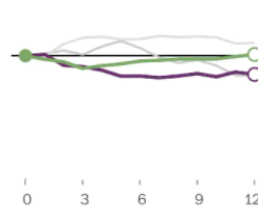**The coronavirus crisis is different**

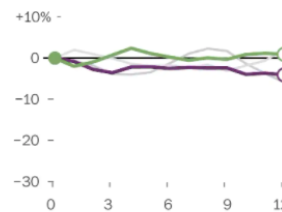Job growth (or loss) since each recession began, based on weekly earnings

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
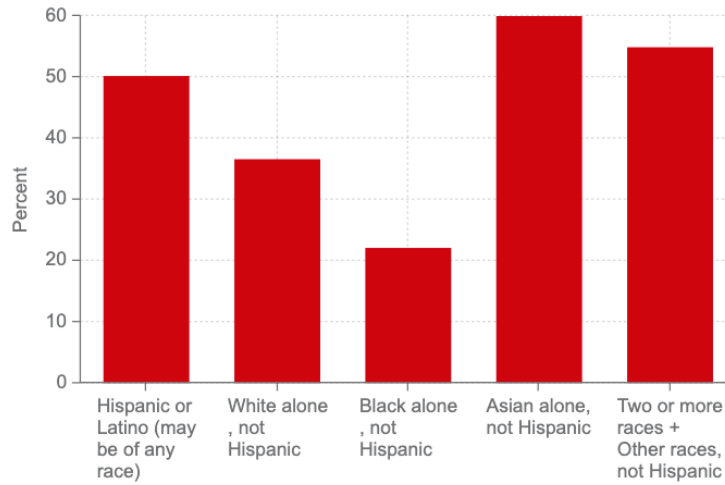THE WASHINGTON POST

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 economic recovery.

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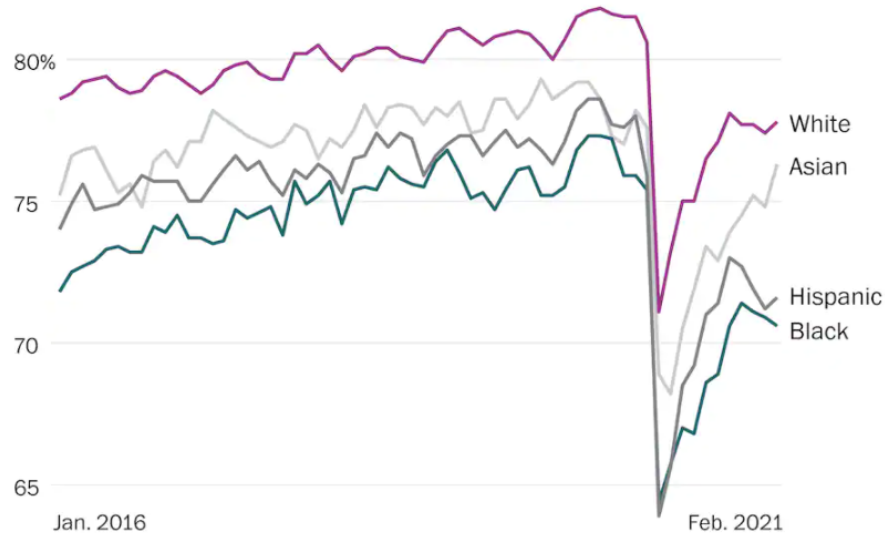
Experienced Loss of Employment Income Since March 13, 2020
ARIZONA by Race/Ethnicity

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
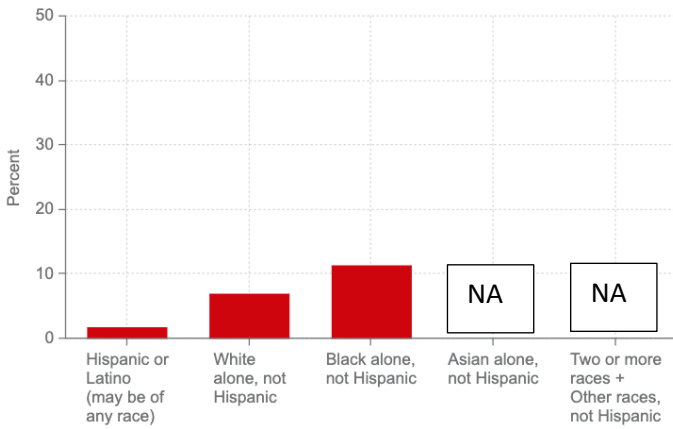

Source: Labor Department   THE WASHINGTON POST

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 - Mar 30 - Apr 11 2022

Source: Census Household Pulse Survey –Week 44

Percent Not Current on Rent by Race/Ethnicity
ARIZONA Renter Households - Apr 27 - May 9 2022
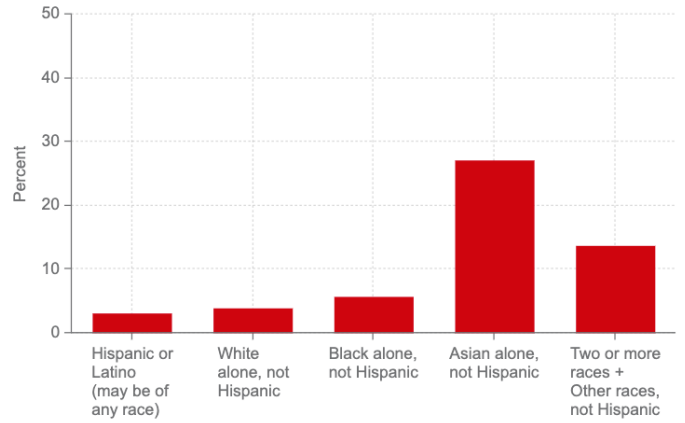
Census Household Pulse Survey –Week 45

"Very Difficult" to Pay Usual Expenses in Last Week
ARIZONA Renter Households - Mar 30 - Apr 11 2022
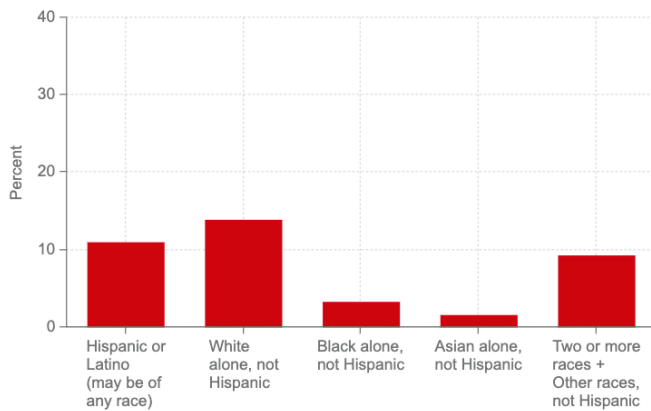
Source: Census Household Pulse Survey –Week 44

"Very Difficult" to Pay Usual Expenses in Last Week
ARIZONA Renter Households - Apr 27 - May 9 2022
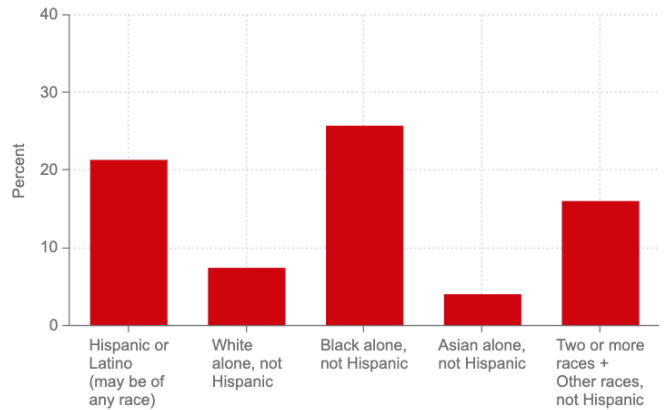
Census Household Pulse Survey –Week 45

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

60%

Low Income

75%

Unemployed

37%

Households with Children

49%

Source: National Equity Atlas – Estimates based on Wave 45 of the Census HPS (Apr 27 – May 9 2022)

Disparities by Ability

Across the four categories of ability/disability tracked in the Census Household Pulse Survey (difficulty seeing, hearing, remembering or concentrating, and walking or climbing stairs) substantially higher percentages of individuals with difficulties in these areas reporting being not current on their rent payments. These data are for the United States at large, as the state-level subpopulations are too small to measure reliability at the state level.

Census Household Pulse Survey –Week 45

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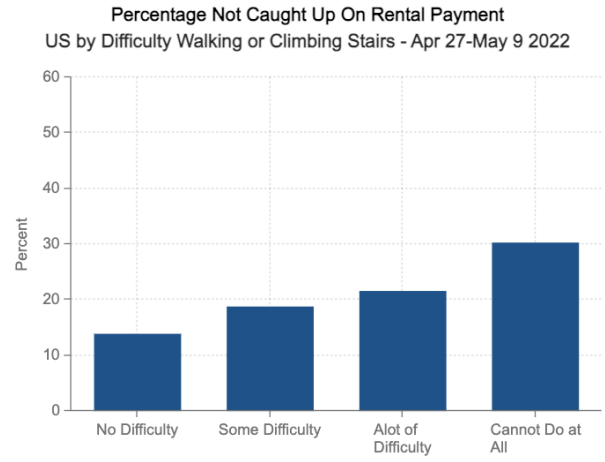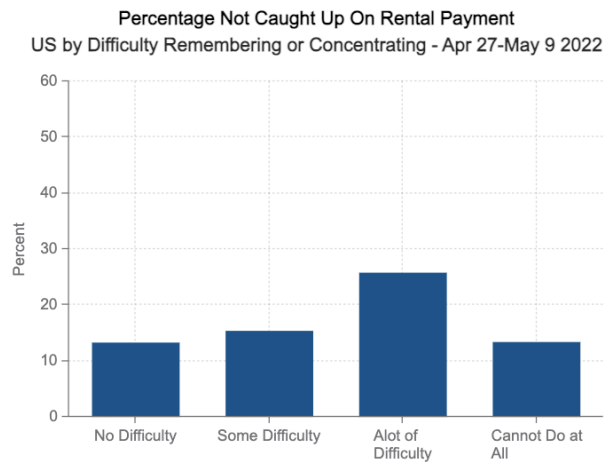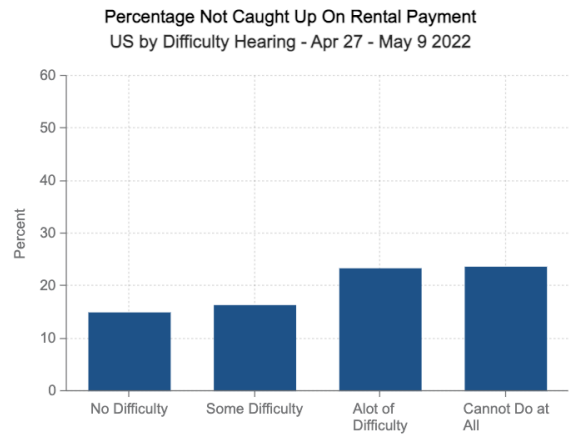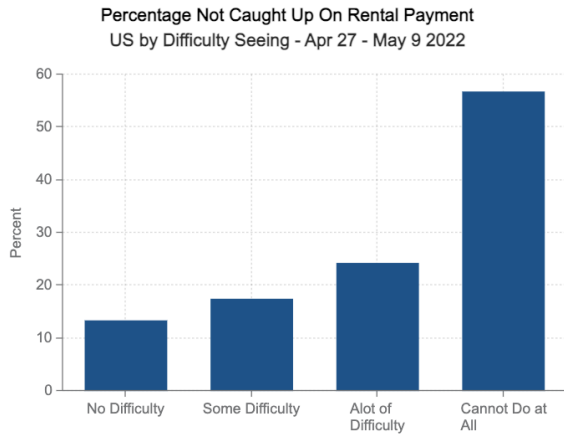
Appendix: National Equity Atlas Rent Debt Methodology[1]

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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[1] Source: https://nationalequityatlas.org/rentdebtmethodology

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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.