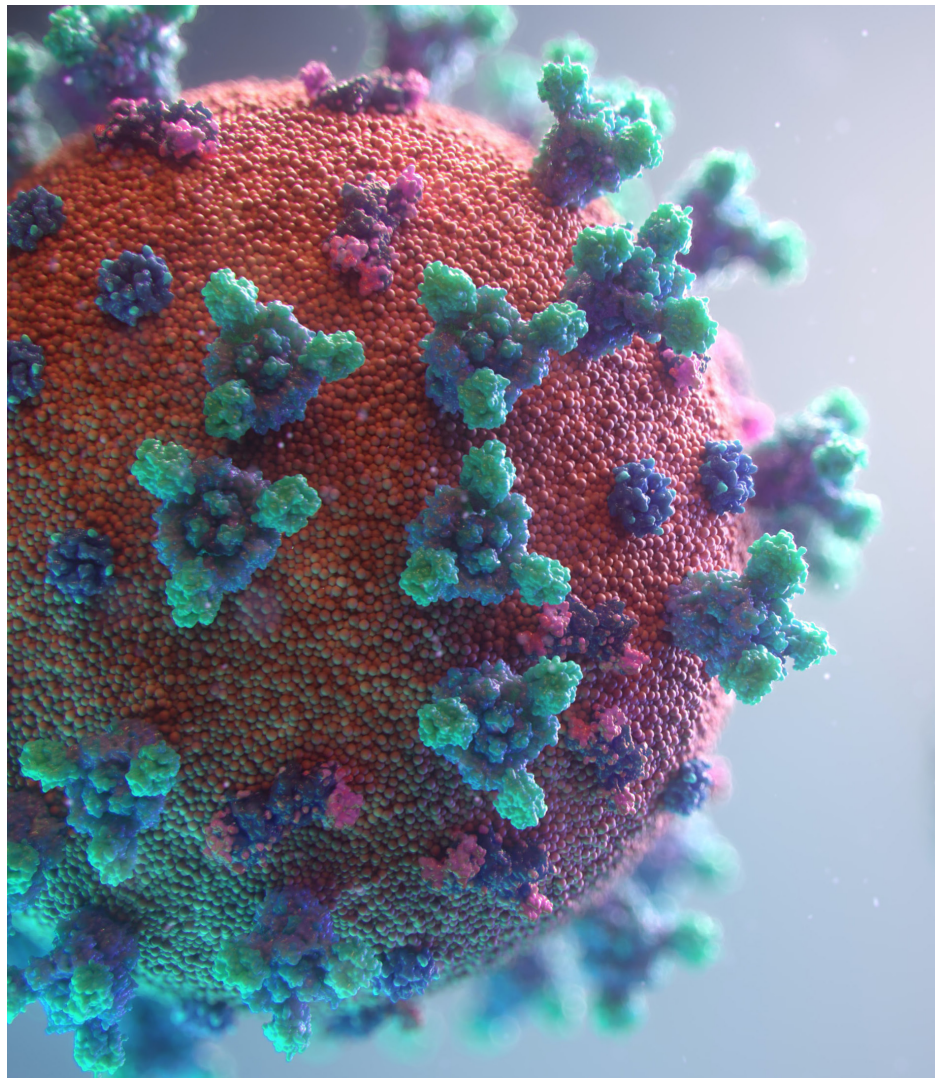




PUBLIC HEALTH REPORT

SHAPING HEALTH IN HAWAII: THE INFLUENCES OF POVERTY, HOUSING AND FOOD INSECURITY

JULY 12, 2023





UHERO

THE ECONOMIC RESEARCH ORGANIZATION
AT THE UNIVERSITY OF HAWAII

UHERO Public Health Report

Shaping Health in Hawaii: The Influences of Poverty, Housing and Food Insecurity

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EXECUTIVE SUMMARY

In June 2023, UHERO's public health team, in partnership with the Pacific Alliance Against COVID-19, carried out the third wave of the UHERO Rapid Health Survey. The study engaged 1,575 adult residents of Hawai'i and examined the links between mental health, food security and socio-economic determinants like housing conditions and poverty status.

Key Findings

General Health Outcomes: Over 70% of participants considered their health to be good to excellent. However, there were significant differences across socio-economic and demographic categories. Native Hawaiians and Filipinos tended to report lower health ratings in contrast to Whites and Non-Filipino Asians. Individuals with high income or food security tended to have more positive health perceptions. On the other hand, those dealing with the long-term effects of COVID, or those who had delayed healthcare, especially mental health services, reported lower health scores.

Barriers to Accessing Healthcare: More than 10% of respondents reported having to delay healthcare, most notably general practitioner visits, dental care, specialty services, and mental healthcare. These barriers to access were diverse, with the predominant causes being unavailability of appointments, work schedule conflicts, and excessive costs.

Barriers to Accessing Mental Healthcare: About 5% of respondents reported having to delay mental healthcare, especially among the youth. Reasons included scheduling difficulties, insurance/provider incompatibility, and costs.

Prevalence of Mental Health Conditions:

Depression

One-third of participants reported symptoms of depression, with unemployment, recent COVID-19 positivity, and youth as significant risk factors for depression. Housing instability, housing cost burden, and poverty are also correlated with higher rates of depression symptoms.

Self-esteem

About 13% of respondents reported low self-esteem, similar to our 2022 findings. Unemployment, COVID-19 impact, poverty, and housing or food insecurity are all correlated with low self-esteem. Age, race, and ethnicity also play significant roles, with young adults and Native Hawaiians, and ethnic groups other than Whites and Asians exhibiting lower self-esteem than their counterparts.

Suicidal Ideation

Rates of suicidal ideation decreased overall from our 2022 findings, yet remain high among unemployed, recent COVID-19 patients, and young adults. Those living in poverty or experiencing a high degree of housing cost burden reported higher ideation rates. Those dealing with housing instability had the highest reported rate of suicidal ideation at 11.1%.

Food Insecurity: Most respondents (80%) reported no food security issues. However, compared with our findings in 2022, there was a small increase in participants reporting very low food security. Unemployment, recent COVID-19 positivity, younger age, certain ethnicities such as Native Hawaiians and Filipinos, poverty, and housing instability all correlated with increased food insecurity. A striking relationship was also observed between the proportion of household income spent on housing and food insecurity, highlighting the interconnected nature of financial stability, housing security, and access to food.

COVID-19 Impact: Over half of respondents had tested positive for COVID-19 since the pandemic began. Racial and age disparities persist, with younger individuals and Native Hawaiians and Filipinos reporting higher rates. Long-COVID has affected 35% of respondents, up from 30% in 2022. There is a clear association between long-COVID and unemployment (49% of unemployed vs. 28% of employed individuals reporting long-COVID in May).

This survey highlights the intricate links between health, socio-economic status, and lifestyle conditions in shaping individual wellbeing. Marginalized and socio-economically disadvantaged groups consistently report poorer health

outcomes, lower self-esteem, higher depression rates, and increased food insecurity. The pervasive impacts of the pandemic and the growing burden of long-COVID further increase the need for targeted multifaceted interventions focusing on economic stability, housing security, and equitable healthcare access to build resilient communities.

INTRODUCTION

The UHERO Rapid Health Survey was designed to inform and refine public health initiatives in Hawai'i amidst the challenges brought on by COVID-19 and other crises. It also seeks to shed light on persistent health disparities. We have established a statewide cohort of over 2000 adult Hawai'i residents for longitudinal observation.

Our initial UHERO Public Health Report ([June 2022\): Health Effects and Views of COVID-19 in Hawai'i](#) highlighted the deleterious impact of the pandemic on the state's population in areas like mental health, food security, and long-COVID. It also offered insights into individual attitudes toward the pandemic. The second UHERO Public Health Report ([January 2023\): Vaccination Booster Uptake Lags as COVID Impact Reach Widens](#) revealed the continued and broadening repercussions of the pandemic, including persistent long-COVID, mental health challenges, and the negative effects of long-COVID on employment status.

At a time when Hawai'i's residents grow hopeful that the worst of COVID is behind them, we introduce our third set of results gathered in Spring 2023, in cooperation with the [Pacific Alliance Against COVID-19](#). This report augments our data collection by including more questions about mental health, health outcomes, access to healthcare and barriers to access, as well as social determinants of health such as food insecurity, poverty levels and housing stability.

Our findings indicate that the health outcomes and social determinants of health explored are inherently intertwined and collectively shape the well-being of Hawai'i's residents. Mental health outcomes are often influenced by socio-economic factors such as employment status, education, and healthcare access. Furthermore, given Hawai'i's nation-leading housing costs, the health effects of housing found in this report warrant further scrutiny. The combination of a high cost of living and below-average wages likely exacerbates food insecurity and stress, contributing to poor mental health. Our findings reveal that these layered social determinants notably affect Hawai'i's marginalized communities, who disproportionately grapple with mental health issues, prohibitive housing costs, and food insecurity. While we don't claim causality, our findings should spur important conversations about potential strategies to address these interrelated social determinants and enhance health outcomes in Hawai'i.

In future reports, we aim to increase the sample size of survey respondents and deepen our exploration of these findings, including exploring causality and cost, to offer a more thorough understanding of these complex social determinants of health.

GENERAL HEALTH OUTCOMES

73% of the population reported good, very good or excellent health, while 15% of the population reported fair or poor health. Results revealed striking disparities across demographic, socio-economic, and lifestyle factors. A significant gap was observed between Native Hawaiians and Filipino vs. White and Non-Filipino Asian respondents, with the former group reporting a lower frequency of excellent or very good health. Income levels and food security status strongly influenced subjective health outcomes, with those below the poverty line and those with severe food insecurity more likely to report fair or poor health. Age also played a role, with younger respondents generally reporting better health. Notably, homeowners reported higher health ratings than renters. Individuals who were affected by long-COVID at some point during the pandemic reported worse health. Lastly, individuals experiencing barriers to accessing healthcare, particularly mental health services, also reported worse health outcomes.

Participants were prompted to evaluate their overall health status on a scale from “Poor” to “Excellent”. 11.1% of the populace claimed to be in excellent health, 38.8% reported very good health, 34.6% declared good health, 13.0% stated fair health, and 2.5% perceived their health as poor. This self-evaluation produced varied results across the different demographics within the sample.

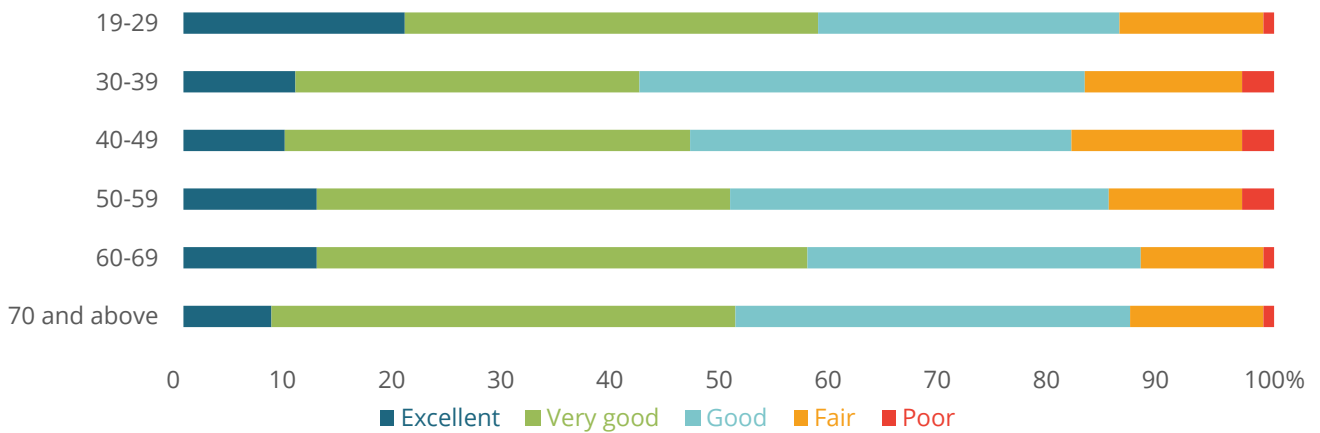
Native Hawaiians were 19% less likely to report excellent or very good health compared to their White counterparts. Native Hawaiian and Filipino respondents were more likely to report fair or poor health, with rates of 20.6% and 18.2% respectively. Asian and White respondents were least likely to evaluate their health as fair or poor (13.4%).

General Health by Race

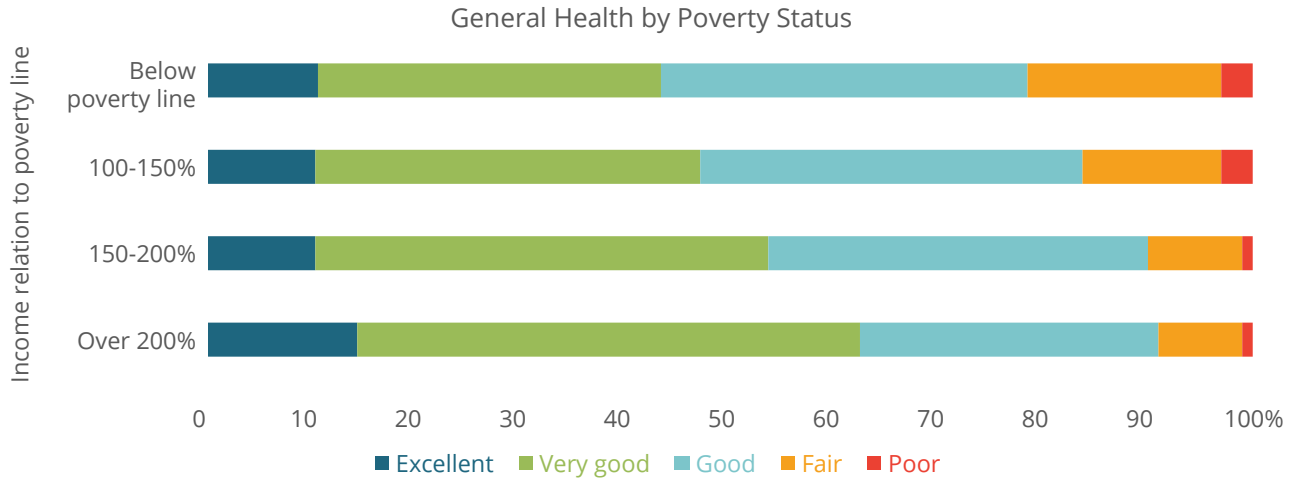


Variations were also evident among different age groups. Predictably, the youngest respondents, with 58%, were most likely to self-report their health as excellent or very good, while the 30-39 age group showed the lowest rate at 41.4%. The 40-49 age group presented the highest proportion of fair or poor health, standing at 18.7%.

General Health by Age Group



The determination of poverty status was made in accordance with federal guidelines that take into account household size and annual income. Based on these parameters, income levels were divided into groups: those below the poverty line, those between 100-150% of the poverty threshold, 150-200%, and those exceeding 200% of the poverty threshold. Individuals living below the poverty line were 12% more likely to self-report their health as fair or poor compared to those earning over 200% of the poverty threshold. Interestingly, those earning between 150-200% of the poverty line were 9% more likely to report their health as excellent or good compared to the 100-150% income group. However, they were still 9% less likely to do so than the highest income group.



Food security status was evaluated based on respondents’ answers pertaining to their access to food and instances when households were unable to afford their desired healthy foods or encountered difficulties in accessing food altogether. Remarkably, individuals experiencing very low food security were 11% more likely to classify their health as fair or poor compared to those with low food security, and they were 25% more likely to do so than those without food security issues. In contrast, the absence of food security problems was linked with a 6% higher likelihood of reporting excellent health and a 17-20% increased probability of categorizing health as very good.



As we cross the three-year mark since the onset of the COVID-19 pandemic, the majority of individuals have experienced infection at some point, and life has regained normalcy for many people. In the context of general health, negligible differences were noted between those who never contracted the virus and those who did but without experiencing long-COVID. However, individuals who experienced long-COVID at some point during the pandemic were 12-14% more likely to describe their health as fair or poor, and they were 16% less likely to report their health as excellent or very good.

Survey responses also revealed a fairly strong link between housing and health. Homeowners reported better health compared to renters or those living without paying rent. Homeowners, both with or without a mortgage or loan, reported excellent or very good health at rates 10-12% higher than those who rented their residences. Renters had the highest incidences of reporting fair and poor health, at 22%, in comparison to only 10-13% among homeowners.

Barriers to accessing health care can have detrimental consequences, as it allows untreated conditions to escalate. Respondents who reported barriers to accessing health care were 18% more likely to describe their health as fair or

poor compared to those who never had to delay their care for any reason. Moreover, they were 8% less likely to rate their health as excellent and 15% less likely to consider it very good. There was also a corresponding decrease in health ratings for those who experienced barriers to accessing mental health care. These respondents were 21% more likely to categorize their health as fair or poor.

General Health by COVID and Long-COVID Contraction



General Health by Home Ownership



General Health by Delayed Health Care



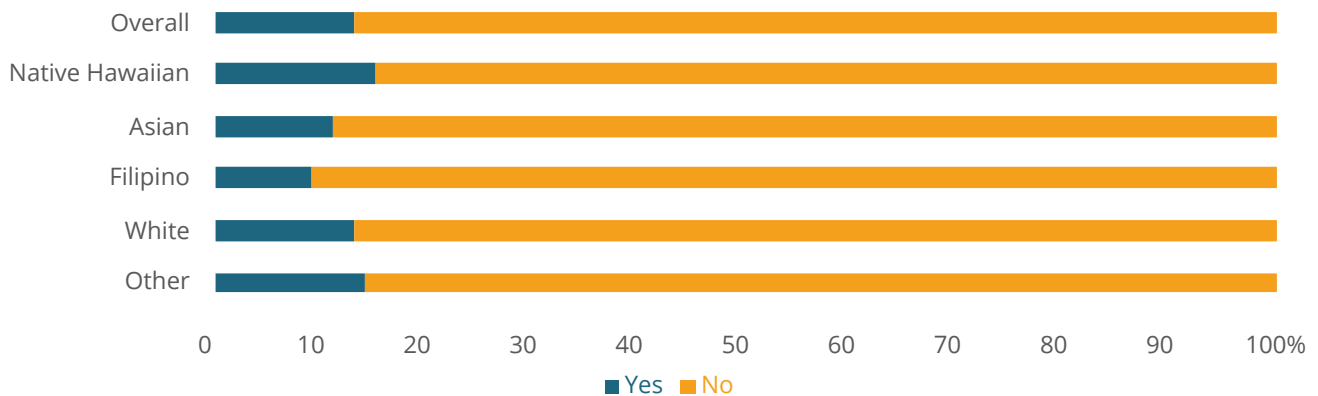
BARRIERS TO ACCESSING HEALTHCARE

A significant 13% of participants reported barriers to accessing healthcare, with the highest instances among Native Hawaiians and individuals aged 30-59. The most affected services included general practitioner visits, dental care, specialty treatments, and mental health. Unavailability of appointments, work commitments, and cost were the leading reasons for having to delay care, with variations observed among insurance status.

About 5% of the cohort reported barriers to accessing mental health care, with higher rates in younger age groups. Most affected mental health care was for counseling or therapy (65%), a psychiatrist or specialist (15%), and urgent mental health or crisis care (10%). Inability to find an appointment (51%), difficulty in finding a provider accepting their insurance (37%), and cost (28%) were key reasons for having to delay mental health care, once again showing differences across insurance status.

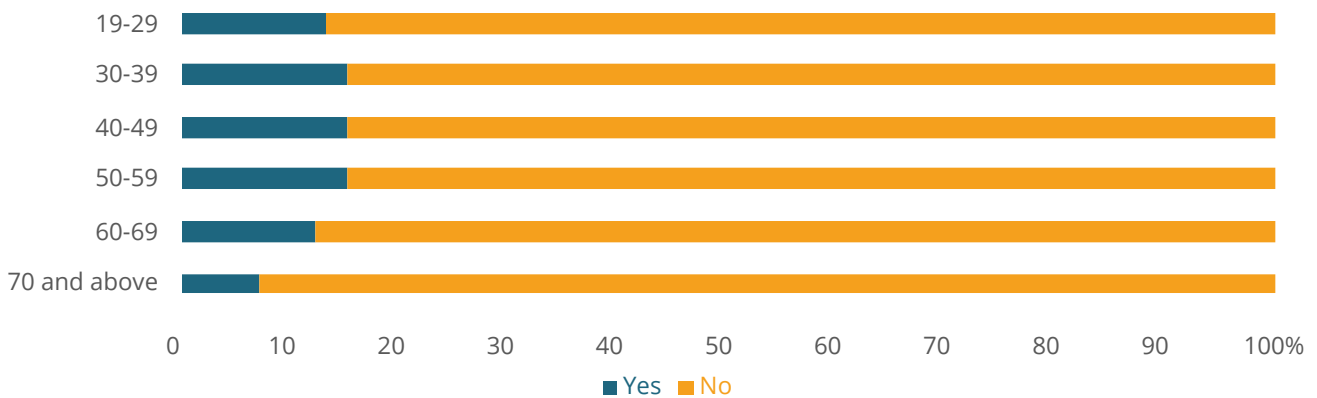
Most respondents did not report barriers to accessing healthcare since November 2022, with only 13.2% reporting delays. Filipinos were the least likely to be affected at 9.7%, with Native Hawaiians having the highest rate at 15.2%.

Sometime since November 2022, did you delay or not get medical care for any reason? - By Race

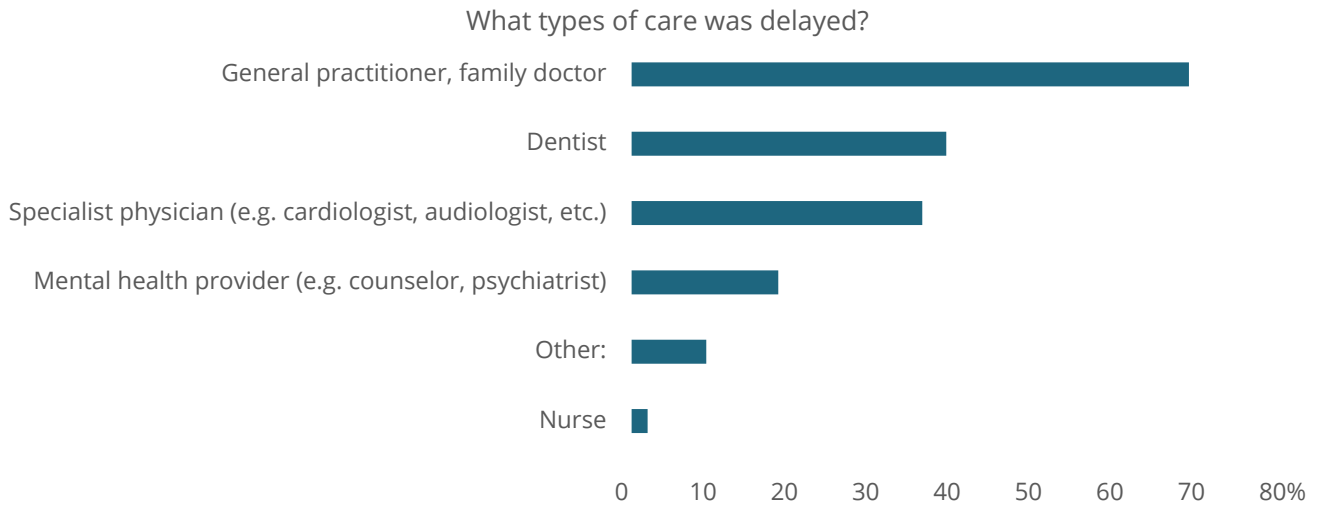


There were some differences in access to healthcare between age groups. Those aged 70 and above were 5-8% less likely to delay care compared to other ages, with only 7.6% reporting delay. Those aged 30-59 were the most likely to delay care at about 15%.

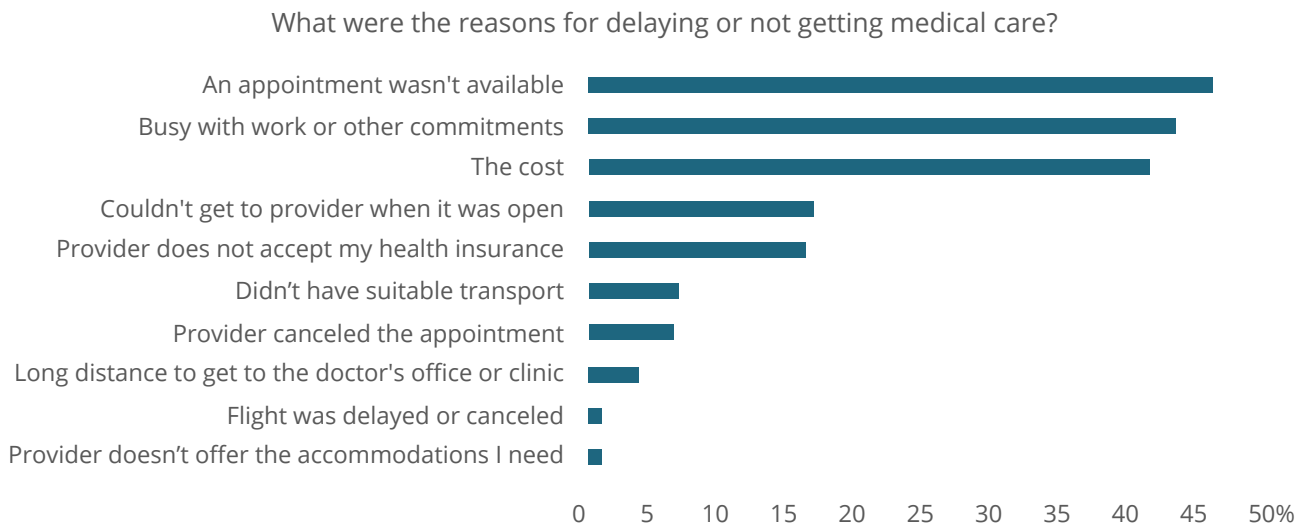
Sometime since November 2022, did you delay or not get medical care for any reason? - By Age Group



Of those who delayed care, most (68.6%) reported that this was for a general practitioner or family doctor. This was followed by dental care (38.7%) and seeing a specialist physician, such as a cardiologist, audiologist or other specialty field (35.8%).



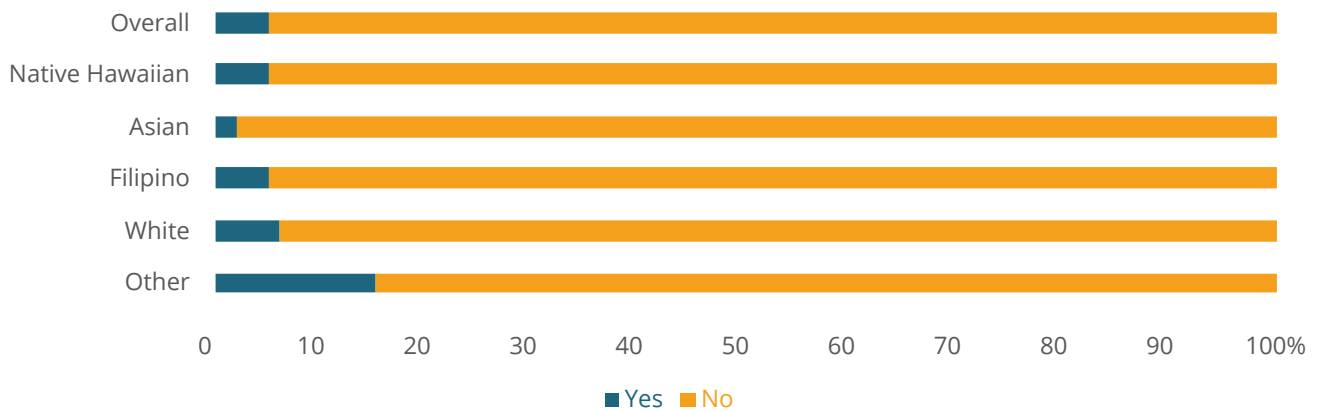
The leading reasons for having to delay care were the unavailability of appointments, cited by 45.6% of respondents, followed closely by work or other commitments precluding time for healthcare (43.1%), and cost-related concerns (41.0%). Other barriers included the clinic or office hours not aligning with the individual’s availability (16.4%), difficulties in locating a provider that accepted their insurance (15.9%), lack of transportation (6.7%), and instances where the healthcare provider canceled the appointment (6.2%).



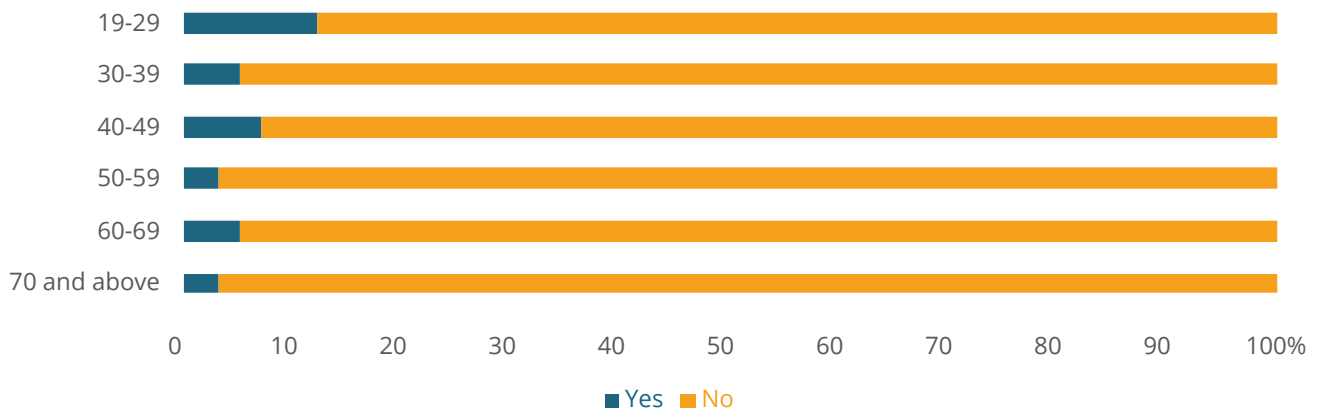
Fewer respondents reported having to delay mental health care at only 5.6%. Asians were the least likely to delay mental health care at only 2.1%, with those who are neither Native Hawaiian, Asian, Filipino, or White being the most likely to delay mental health care at 15.9%.

Despite the increasing mental health awareness among younger generations, those aged 19-29 reported higher instances of barriers to mental health care. This age group was 5-9% more likely to report having to delay mental health services, underscoring the critical need for timely care in this demographic.

Since November 2022, was there any time when you needed care from a mental health professional but did not get it?



Since November 2022, was there any time when you needed care from a mental health professional but did not get it?



MENTAL HEALTH IN HAWAI'I

Overall rates of depression decreased slightly in May 2023 compared to November 2022, with about 1 in 3 adults reporting depression symptoms and unemployment, a positive COVID test, and younger age correlating with heightened depressive symptoms. Racial and socioeconomic disparities were evident, with Whites and those living below the poverty line reporting more symptoms while non-Filipino Asians reported the least. Furthermore, socio-economic factors played a significant role: food insecurity and less secure housing conditions, including renting and government subsidy, were associated with increased likelihood of depression. Interestingly, spending more than 30% of income on housing was also linked to higher likelihood of depression in the cohort, underscoring the broad impact of socioeconomic factors on mental health.

Depression

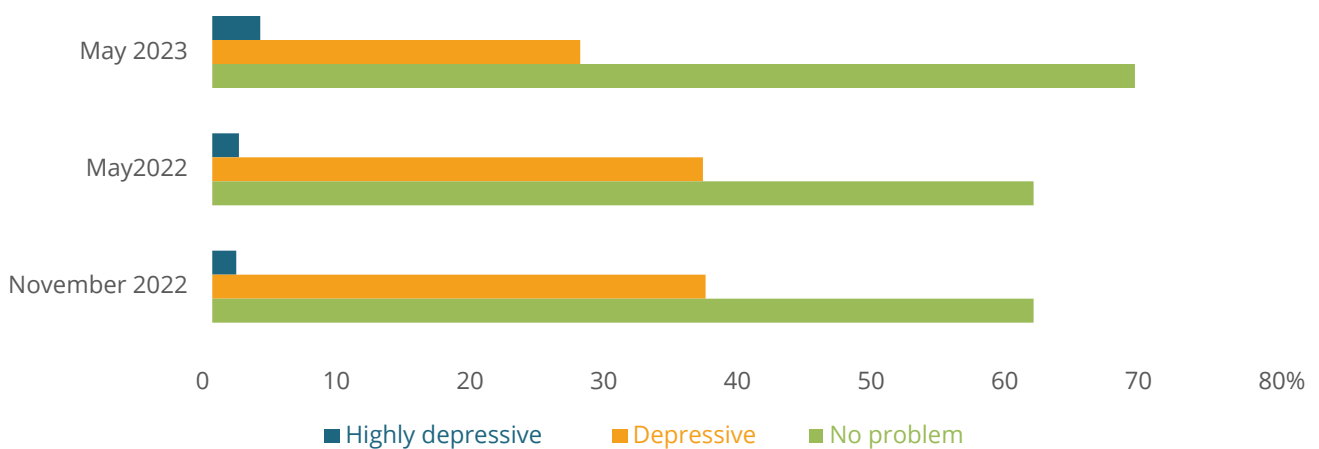
Symptoms of Depression

Just as we did in the Spring and Fall surveys of 2022, we evaluated the prevalence of depression using the 10-item Center for Epidemiological Studies-Depression (CES-D) scale. This scale asked respondents to quantify the frequency of

various depression-related symptoms they had experienced over the past week, including restless sleep, poor appetite, and feelings of loneliness. The CES-D scale provides a maximum total score of 30: a total score below 10 is considered normal, scores between 10 and 20 indicate symptoms of depression, while scores exceeding 20 suggest severe depressive symptoms.

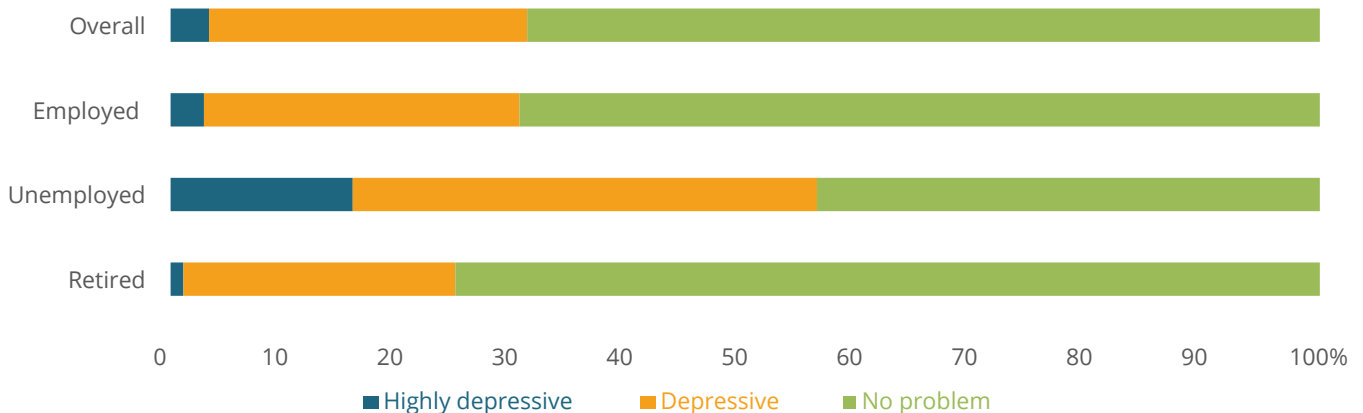
The graph below exhibits the shifts in reported depression symptoms between May 2023, November 2022, and May 2022. In May 2023, there was a slight rise in the count of people expressing strong depressive symptoms when compared to November 2022 and May 2022. Approximately 3.5% of respondents disclosed strong depressive symptoms, nearly double the rates reported in November 2022 (1.8%) and May 2022 (2%). Meanwhile, 68.9% of individuals displayed no depressive symptoms and 27.57% reported symptoms of depression in May 2023. Comparatively, 61.4% of respondents indicated no symptoms of depression in November 2022, with the rates of depressive symptoms in our cohort being 36.8% in November 2022 and 36.6% in May 2022.

Depression Symptoms by Month



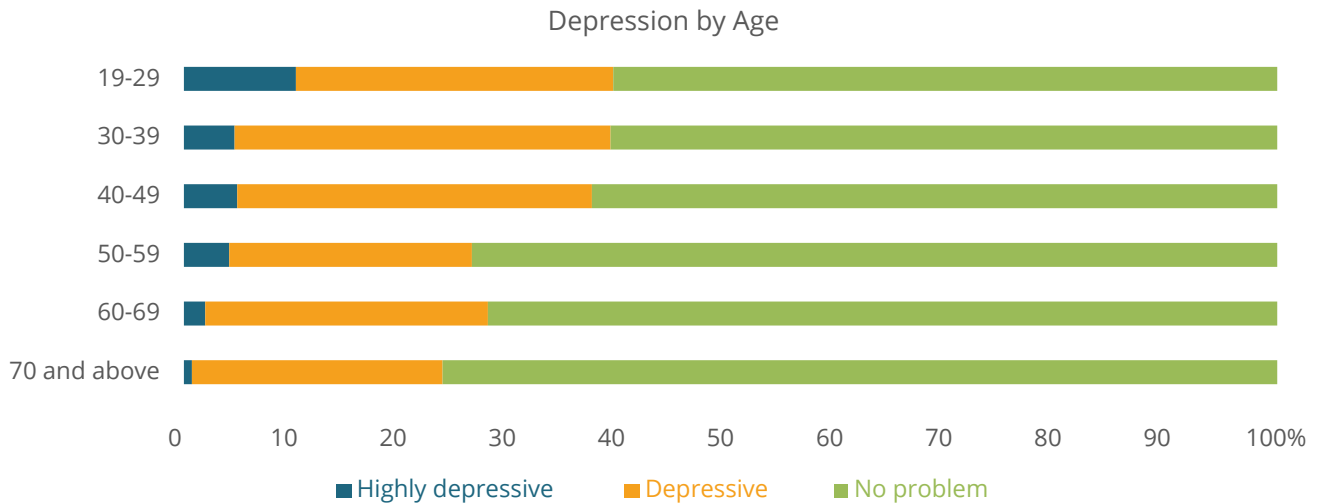
Roughly one-third of Hawai'i's residents reported experiencing some form of depression symptoms in the Spring of 2023. Particularly, those who were unemployed exhibited these symptoms at a higher rate (56.3%) compared to those who were employed (30.5%). The unemployed group recorded the highest incidence of severe depressive symptoms, with a rate of 15.9%, significantly more than the 2.9% found among the employed group. Only a small fraction of retirees, 1.2%, reported severe depressive symptoms. Furthermore, differences were evident when comparing individuals who had tested positive for COVID-19 in Spring 2023 with those who had not. Those who tested positive were more prone to depression symptoms (37.2%) compared to those who tested negative (27.1%). Of those who tested positive, 5.6% exhibited severe depressive symptoms, a figure that surpasses the rate of 2.6% seen among those who had not contracted COVID-19 recently.

Depression by Employment Status

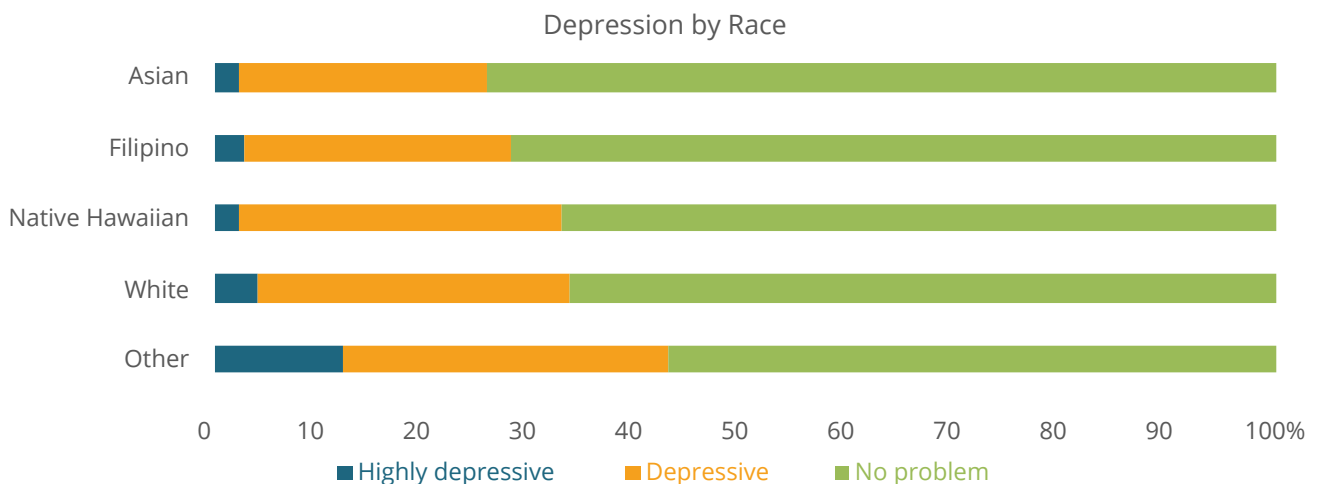


Depression symptoms by age and race group

In our analysis, we divided participants into six age brackets: 19-29, 30-39, 40-49, 50-59, 60-69, and 70 and above. Mirroring our findings from November 2022, depressive symptoms were less commonly reported among older individuals. In the age group of 70 and above, a significant 76.3% reported no depressive symptoms, a stark contrast to the 60.7% in the 19-29 age group. Moreover, strong depressive symptoms were reported by 10.1% of those between the ages of 19 and 29, compared to a mere 0.6% in the 70 and above group. The 50-59 age group reported no depressive symptoms in 73.6% of cases, with only 4.2% expressing highly depressive symptoms. Among individuals aged 60-69, highly depressive symptoms were even less common, reported by just 1.9%.



We further segregated the sample into five racial and ethnic categories: Non-Filipino Asian, Filipino, Native Hawaiian, White, and Other. Asians demonstrated the lowest propensity to reporting depression symptoms with 74.3% reporting none, followed by Filipinos at 72.1%, and Native Hawaiians at 67.1%. Individuals from other races reported no depressive symptoms in 57.3% of cases. Interestingly, white individuals were more prone to severe depressive symptoms (4.1%) compared to Asians (2.3%) and Native Hawaiians (2.4%). As for moderate depressive symptoms, the Native Hawaiian group reported a significantly higher rate (30.5%) compared to the Asian group (23.5%).

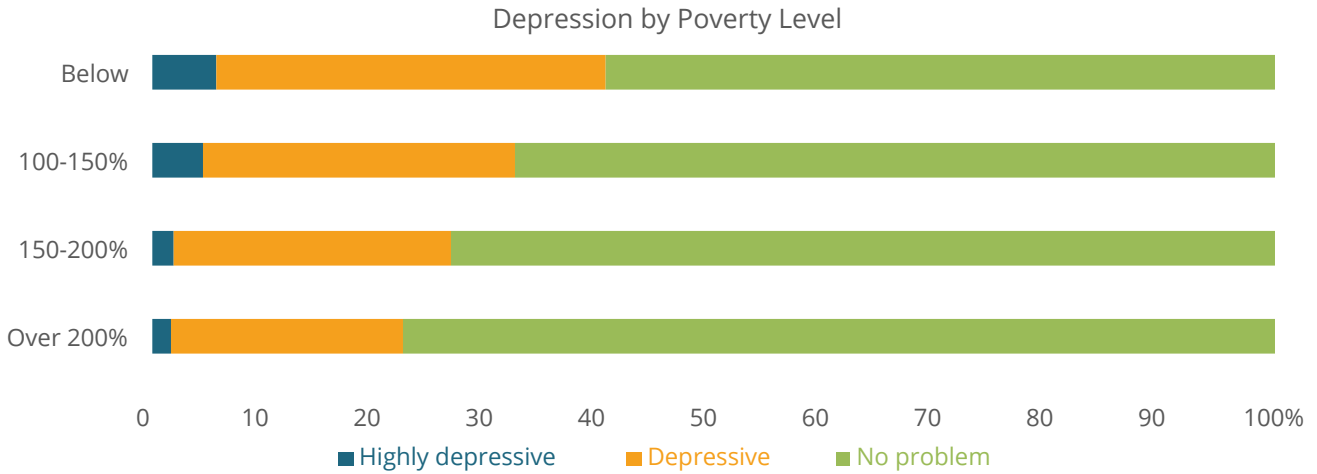


Depression by poverty level

We assess poverty levels utilizing two criteria: the number of household members and the total household income. The state’s poverty guidelines dictate the poverty threshold relative to household size¹.

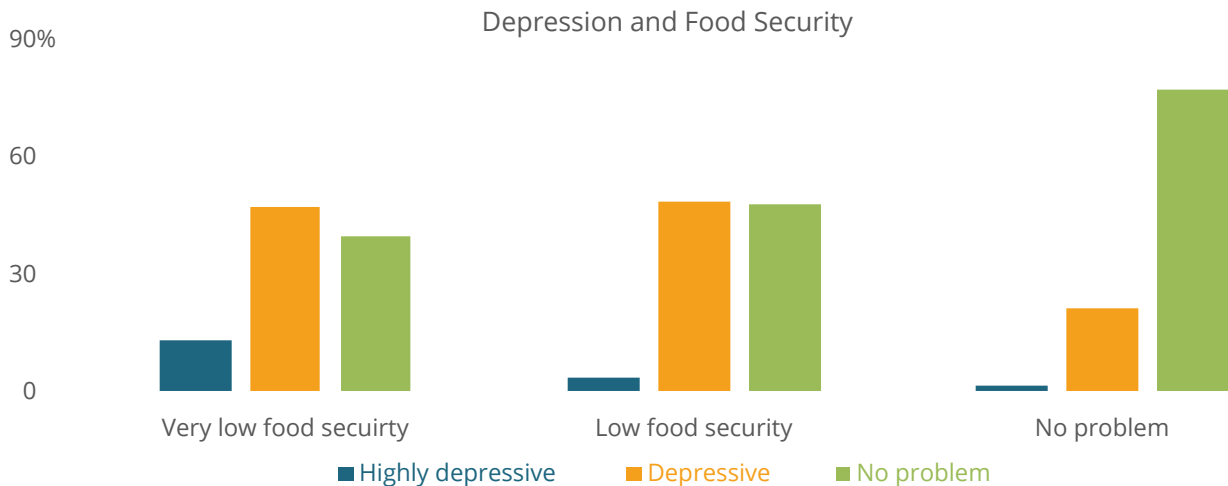
1 <https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines>

According to these criteria, we subdivided our sample into four income groups: below the poverty line, 100-150% of the poverty line, 150-200% of the poverty line, and above 200% of the poverty line. Individuals whose income exceeds 200% of the poverty line are generally considered financially stable. In comparison to other income groups, those with household incomes below the poverty line appear to be more susceptible to depressive symptoms. Of this group, 34.7% report symptoms of depression, with 5.6% experiencing severe symptoms. On the other hand, 77.6% of those with household incomes above 200% of the poverty line reported no depressive symptoms, with only 1.5% experiencing severe symptoms. Of those with incomes between 100-150% of the poverty line, 27.9% reported depressive symptoms and 4.5% reported severe depressive symptoms. Only about 1.9% of those earning between 150-200% of the poverty line reported severe depressive symptoms.



Depression by food insecurity

Food insecurity is divided into three tiers: no issues, low food security, and very low food security according to United States Department of Agriculture standards. Individuals who face no issues with food insecurity are less likely to experience symptoms of depression. Among those unaffected by food security issues, 77.2% show no signs of depression, while a mere 1.4% report severe depressive symptoms, and 21.4% experience some symptoms. In stark contrast, those who face very low food security are more likely to present depressive symptoms. A significant 13.3% of those experiencing very low food security report severe depressive symptoms, which is noticeably higher than the 3.4% in the low food security category. Around 47.2% of those with very low food security report some depressive symptoms, with less than 40% showing no symptoms at all.

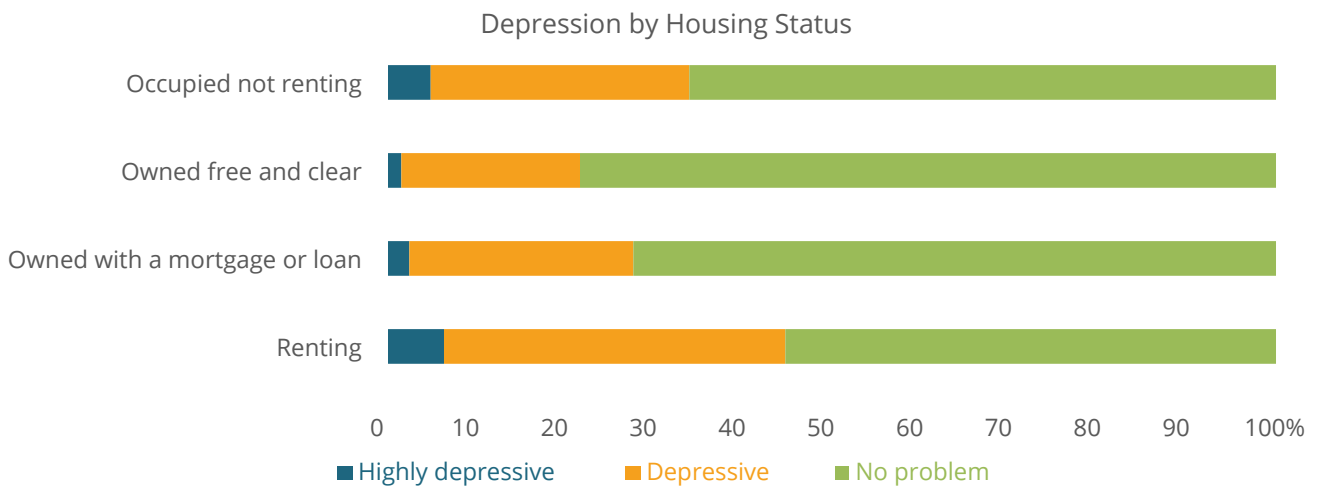


Depression and housing condition

To evaluate the housing conditions of respondents, we apply four key metrics: homeownership status; receipt of housing cost subsidies from federal, state, or local governments; stability of housing since November 2022; and the proportion of income allocated towards housing expenses. We will further scrutinize the correlations between these individual metrics and symptoms of depression.

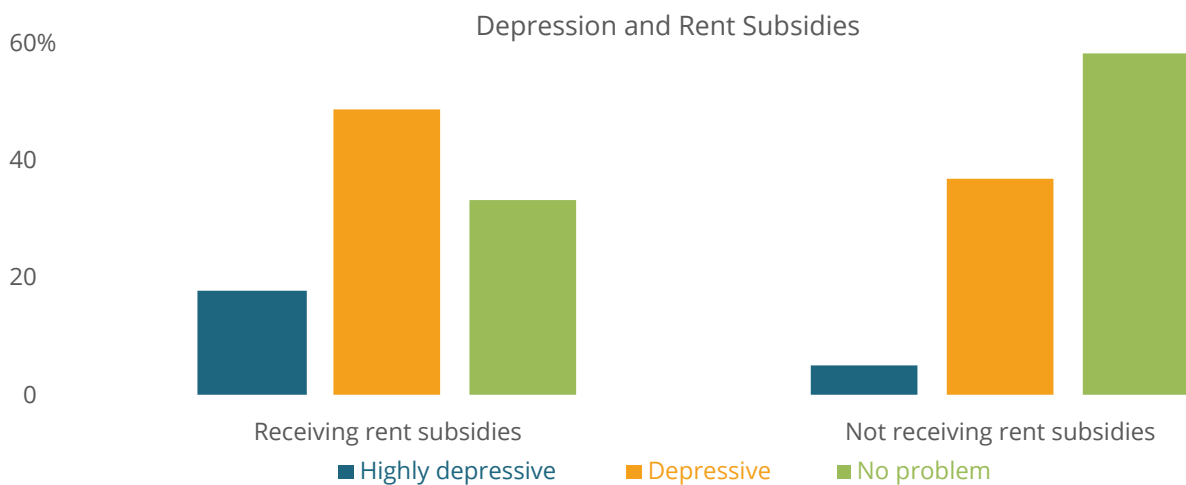
Depression and home ownership

People residing in rented homes appear to exhibit higher levels of depressive symptoms. Among renters, only 55% reported no depression symptoms, while 6.6% showed signs of severe depression and 38.4% presented some symptoms of depression. In contrast, people living in their own homes, regardless of whether they are paying for a mortgage, seem less prone to depressive symptoms. On average, 75% of homeowners do not exhibit depressive symptoms. Notably, individuals without a mortgage or loan are the least likely to experience depressive symptoms. Only 1.7% of this group have severe depressive symptoms, a rate lower than people with a mortgage or loan (2.4%). Those who neither own their home nor pay rent (e.g. living with family members rent free) are more vulnerable to depression, with 29.3% showing signs of depressive symptoms, and 4.9% demonstrating severe symptoms.



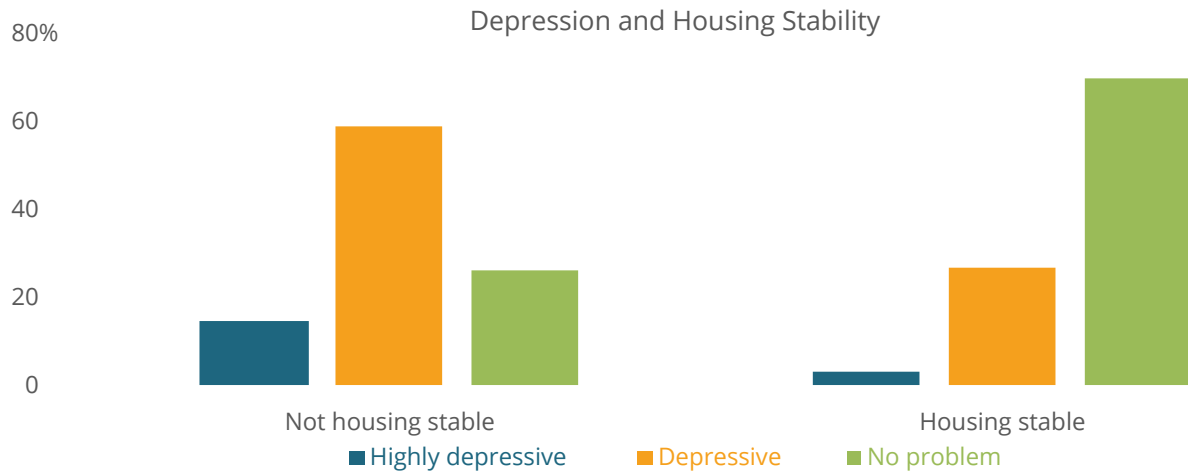
Depression symptoms and rent subsidy

Depressive symptoms are more common among individuals receiving housing cost subsidies from the federal, state, or local government. This is likely not a consequence of the subsidy itself, but the financial stress of these households. Only 33.3% of this group reported no depression symptoms, significantly lower than the 58.1% of people not receiving such subsidies. Furthermore, 48.9% of subsidy recipients showed signs of depression, and a sizable 17.8% reported severe depressive symptoms. In contrast, among those without rent subsidies, only 5% showed severe depressive symptoms.



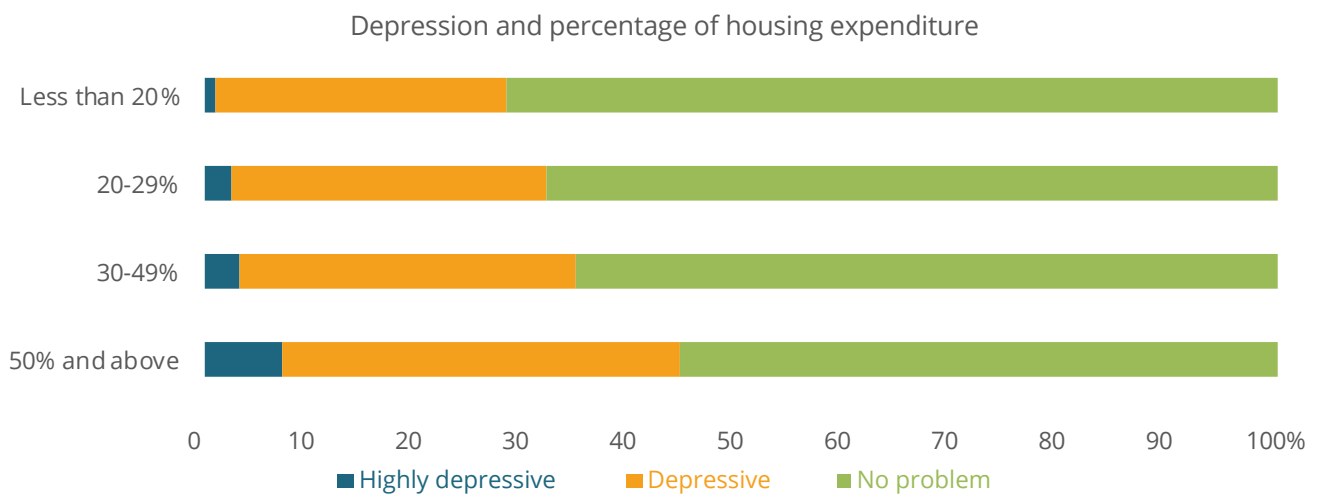
Depression and Housing lost/Unstable housing

Participants were asked if they had lost stable housing since November 2022 (i.e., staying with family or friends, homelessness, living in a car). Unsurprisingly, individuals who lost housing or currently live in unstable conditions are more likely to experience depressive symptoms. Only 25.9% of this group reported no depression symptoms, while nearly 60% reported some degree of depression. In contrast, 69.7% of people living in stable housing reported no depression symptoms, with 3.3% showing signs of severe depression.



Depression and percentage of income spent on housing

The sample was divided into four categories based on the percentage of income spent on housing: less than 20%, between 20-29%, between 30-49%, and 50% and above. Following the conventional recommendation that housing costs should not exceed 30% of income, we found that individuals whose housing costs fall below this threshold are less likely to experience depressive symptoms. More than 71% of people who spent less than 20% of their household income on housing reported no depression symptoms, with only 1.2% showing severe depressive symptoms. 68% of people who spent 20%-29% of their household income on housing reported no depression symptoms; almost 30% of these people have depression symptoms. In contrast, only 55.7% of individuals spending 50% or more of their income on housing reported no depression symptoms. More than 37.1% of this group exhibited signs of depression, and 7.2% of these people reported severe depressive symptoms. Among people spending 30-49% of their income on housing, 65.4% reported no depressive symptoms, while 3.2% demonstrated severe depressive symptoms.



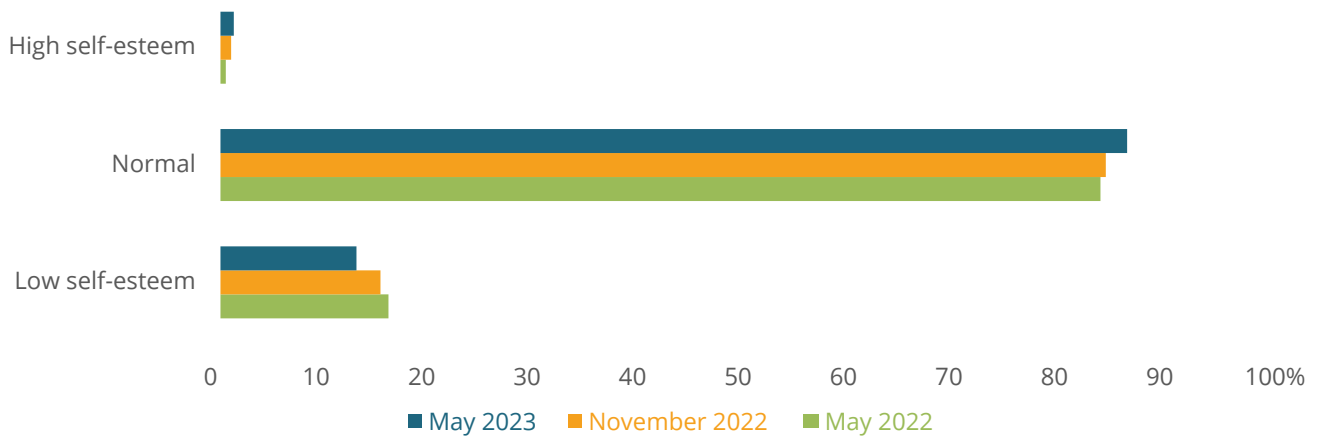
Self-esteem

Approximately 13% of the participants reported low self-esteem, a figure mirroring our findings from 2022. Self-esteem is highly sensitive to personal circumstances, with those unemployed, suffering from COVID-19, or dealing with poverty and food insecurity showing higher instances of low self-esteem. Likewise, housing instability and the burden of housing costs have a considerable influence on one's self-esteem. Age, race, and ethnicity also play significant roles, with young adults, Native Hawaiians, and ethnic groups other than Asians and Whites exhibiting lower self-esteem than their counterparts.

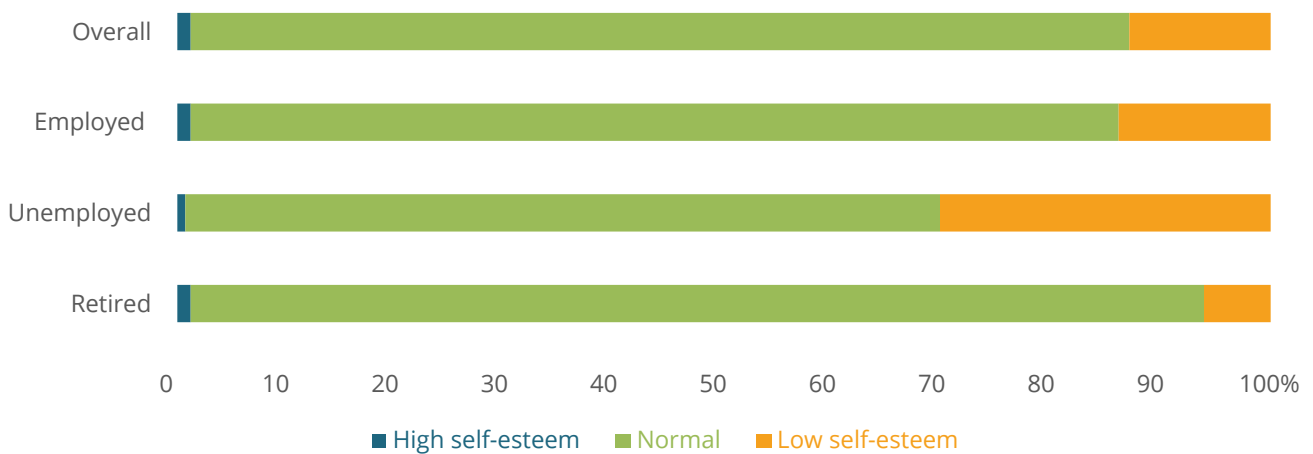
Self-esteem was assessed using the Rosenberg Self-Esteem Scale, a 10-item scale that measures both positive and negative self-perceptions. Basic descriptive statistics were compiled, and the outcomes compared with those of Spring and Fall 2022, as presented in the subsequent figures.

In many aspects, the May 2023 results parallel the findings from November 2022. Approximately 13% of respondents reported low self-esteem, while around 1% indicated high self-esteem. In May 2023, 85.8% of participants declared they possessed normal self-esteem, a slight increase compared to the 83.9% and 83.4% reported in November 2022 and May 2022, respectively.

Self-esteem by Month



Self-esteem by Employment Status



With respect to employment status, the trends identified in the first two rounds of UHERO Rapid surveys persist. Unemployed individuals exhibit lower self-esteem compared to their employed and retired counterparts. Among the unemployed, 30.2% reported low self-esteem, compared to 13.7% of employed individuals and a mere 6.1% of retirees. Only

0.8% of unemployed participants reported high self-esteem, a figure lower than the proportion of employed (1.2%) and retired individuals (1.4%) with high self-esteem.

Additionally, the study uncovered that individuals who recently tested positive for COVID-19 are more inclined to experience low self-esteem. Among these individuals, 17.1% reported low self-esteem, compared to 10.5% of those who have not been infected with COVID-19.

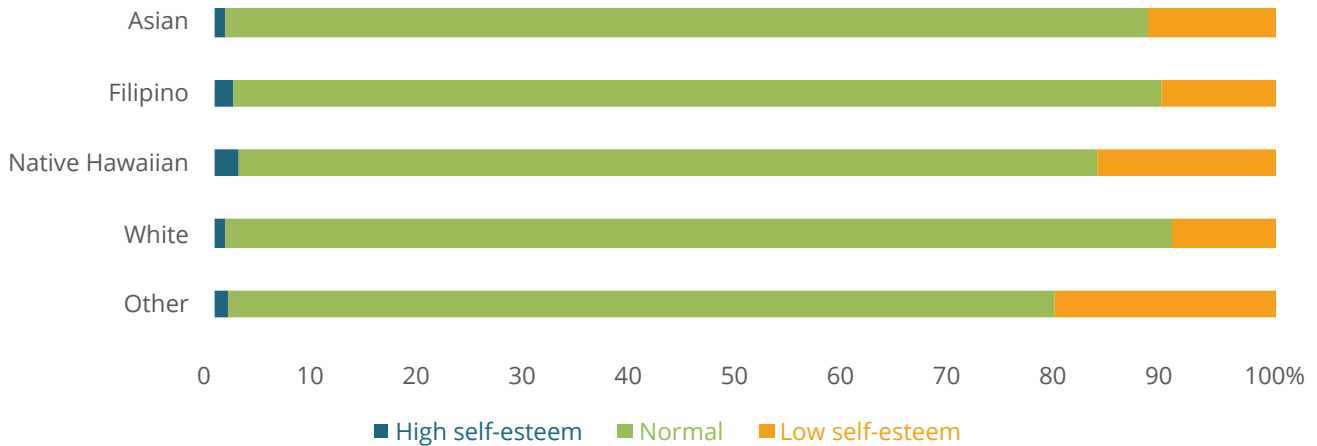
Self-esteem by race and age group

Race disparities were observed in self-esteem outcomes: White, Filipino, and Asian respondents had higher self-esteem than other race groups. 89.3% of Whites have normal self-esteem while 87.5% of Filipinos have normal self-esteem. 16.7% of Native Hawaiians have low self-esteem. 2.4% of Native Hawaiians have high self-esteem.

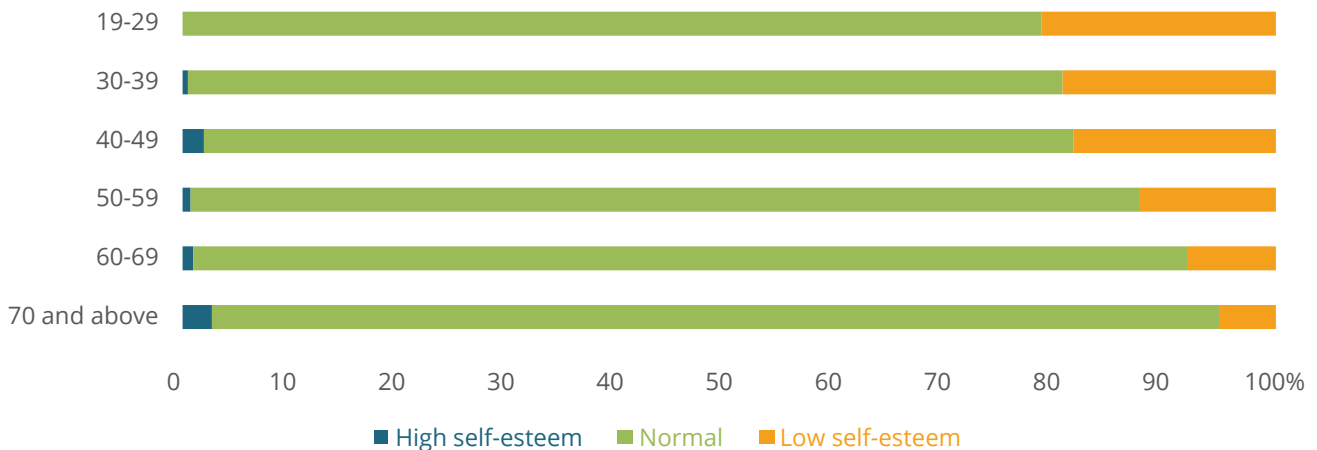
Self-esteem was also differentiated by age groups. Younger people are more likely to have low self-esteem than older people. 21.3% of people aged 19-29 have low self-esteem while only 5.1% of people aged 70 and above report low self-esteem. 2.5% of people aged 70 and above have high self-esteem.

When evaluated by race, 86.9% of Asian participants and 89.3% of White individuals displayed normal self-esteem levels. High self-esteem was reported by 2.4% of Native Hawaiians, 1.0% of Whites, and 1.9% of Filipinos.

Self-esteem by race



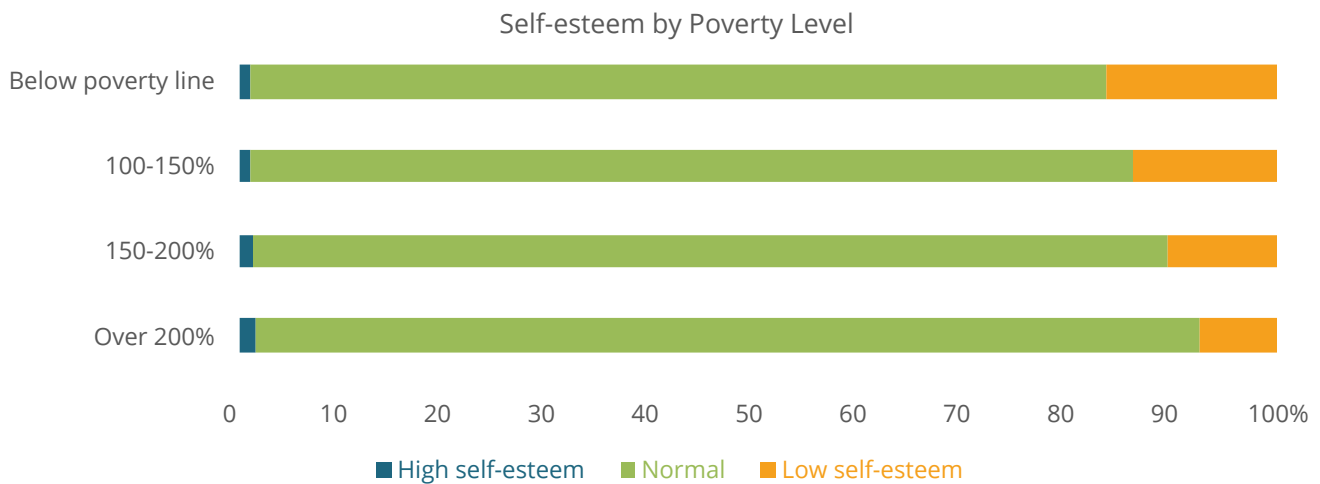
Self-esteem by Age



Aligned with the initial two surveys in May and November 2022, younger individuals appear to struggle more with low self-esteem. Specifically, 21.4% of the 19-29 age group report low self-esteem, a figure which significantly outpaces the 5.1% in the 70 and above age bracket. Among this older group, 2.5% reported high self-esteem, and 92.4% indicated normal self-esteem. In the 30-39 age group, 19.5% reported low self-esteem, while 8.0% in the 60-69 age category indicated low self-esteem.

Self-esteem by poverty level

We also observe individual self-esteem by poverty level. Importantly, people who are below the poverty line are more likely to have low self-esteem. 16.5% of people who are below the poverty line have low self-esteem, and 1.0% have high self-esteem. By contrast, 91.0% of people who have household incomes over 200% of the poverty line have normal self-esteem, 1.5% have high self-esteem, and 7.4% report low self-esteem. 10.5% of people who have household incomes between 150 and 200% of the poverty line have low self-esteem, whereas 88.2% have normal self-esteem.



Self-esteem and food insecurity

In assessing the correlation between self-esteem and food security, individuals facing food insecurity were found more likely to have low self-esteem. Specifically, 29.4% of those with very low food security reported low self-esteem, and a mere 0.6% indicated high self-esteem. Comparatively, those without food insecurity reported 90.2% normal self-esteem, and a low self-esteem rate of 8.7%.

Self-esteem and housing condition

Investigating self-esteem in relation to housing conditions reveals that renters are more prone to low self-esteem than homeowners. Specifically, 21.4% of renters reported low self-esteem, significantly higher than homeowners without a mortgage or loan at 7.9%. Renters receiving a subsidy from the federal, state, or local government also displayed higher rates of low self-esteem, with none in our sample falling into the high self-esteem category.

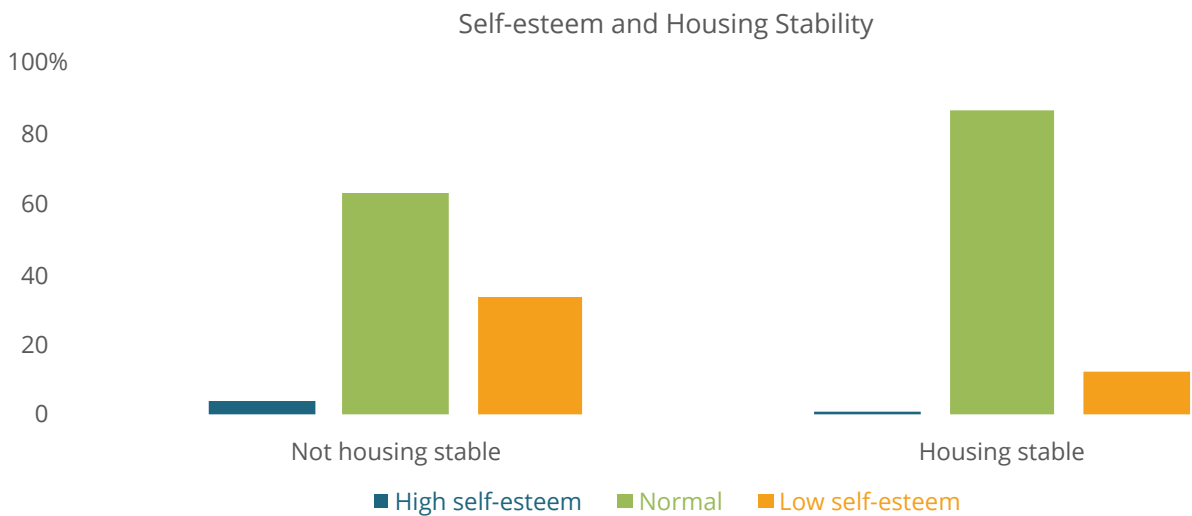
Those who had lost their housing or experienced unstable housing since November 2022 were more likely to report low self-esteem, with over 33% in this category. In contrast, only 12.5% of those with stable housing reported low self-esteem.

Renters who receive a subsidy from the federal, state, or local government are more likely to have low self-esteem. None of the subsidy receivers in our sample self-categorize into the high self-esteem group, while 29% report low self-esteem. 1.6% of renters who do not receive a subsidy from the federal, state, or local government self-classify as having high self-esteem. More than 78% of these people have normal self-esteem.



Self-esteem and unstable/lost housing

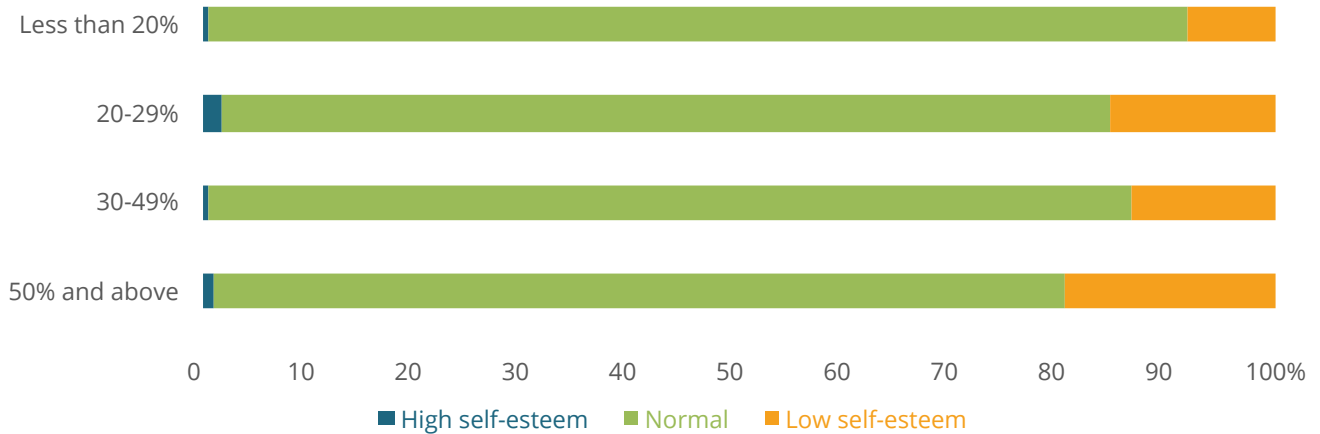
Individuals who have lost their housing or experienced unstable housing conditions since November 2022 exhibit a higher likelihood of reporting low self-esteem. Over 33% of those facing housing instability reported low self-esteem, while nearly 63% fell within the normal self-esteem category. In contrast, over 86% of individuals who have not lost their housing or experienced instability have normal self-esteem, with only 12.5% reporting low self-esteem. 3.7% of individuals facing unstable housing conditions displayed high self-esteem.



Self-esteem and percentage of housing expenditure on total household income

People who spend less of their household income on housing are less likely to have low self-esteem. Only 8.1% of those with housing costs less than 20% of their income in housing have low self-esteem, and more than 91% have normal self-esteem. By contrast, almost 20% of people who spent 50% or more of their household income on housing have low self-esteem. 13.4% of people who spent 30-49% of household income on housing have low self-esteem. More than 86% of these people have normal self-esteem.

Self-esteem by Housing Expenditure

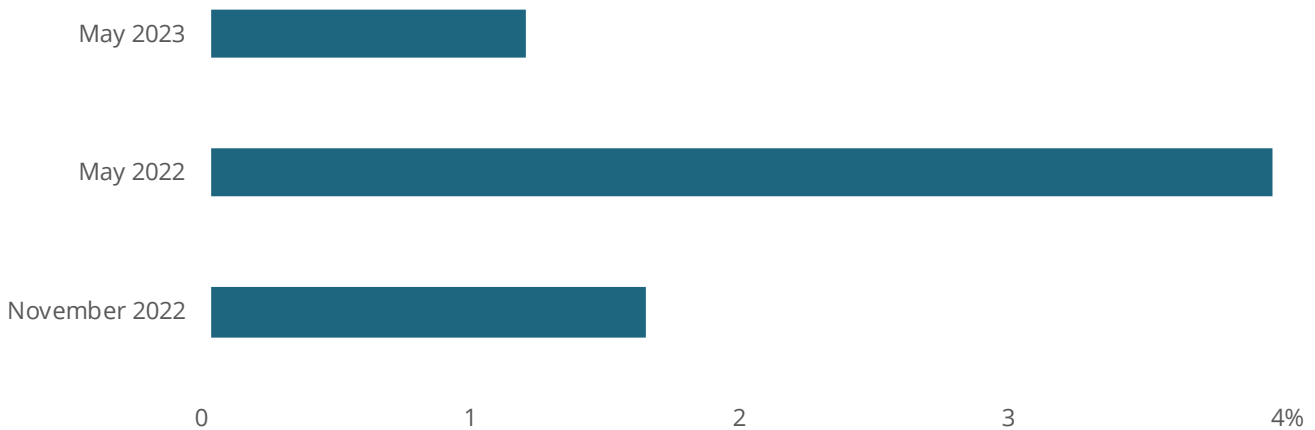


Suicidal ideation

1.2% of respondents had contemplated suicide in the past month, marking a decrease from previous findings in May 2022 (3.9%) and November 2022 (1.6%). The rate of suicidal ideation was highest among the unemployed (4.0%), recent COVID-19 patients (1.7%), and young adults aged 19-29 (5.6%), while retirees (0.7%) and older individuals (0.9%) reported lower rates. Socioeconomic factors played a crucial role, with those living below the poverty line, experiencing food insecurity, and spending a significant portion of their income on housing reporting higher rates of suicidal ideation. Conversely, homeowners without a mortgage or loan reported lower rates of suicide ideation. The most concerning group were individuals experiencing housing instability, with 11.1% considering suicide, illustrating the significant impact of housing security on mental health.

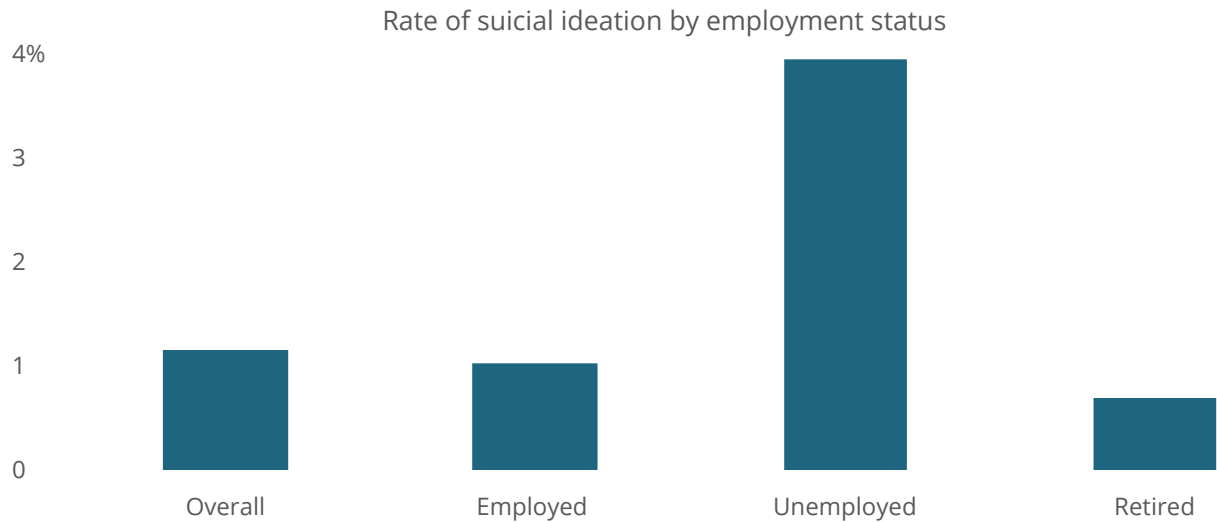
We surveyed respondents about whether they experienced suicidal ideation during the past month. Overall, 1.2% of survey respondents contemplated suicide during the past month, which is significantly lower than the 3.9% of respondents in May 2022 and 1.6% of respondents in November 2022.

Rate of suicidal ideation by month

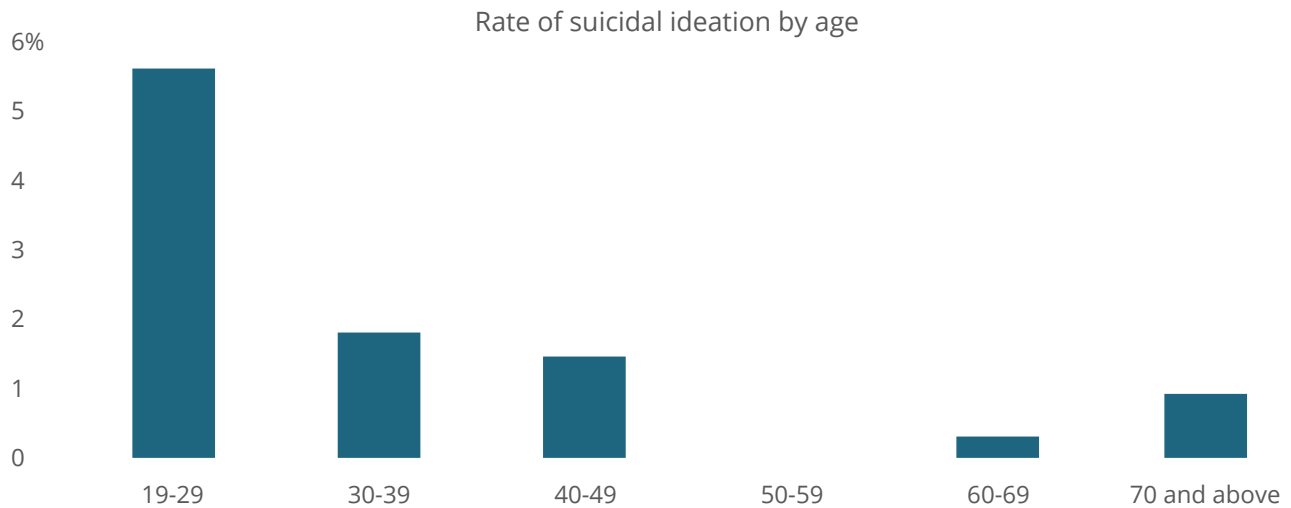


Similar to November 2022, when broken down by employment status, 4.0% of unemployed people reported having suicidal ideation, which is significantly higher than employed and retired people. Employed people had a suicidal ideation rate of 1.0%, and retirees had a rate of only 0.7%.

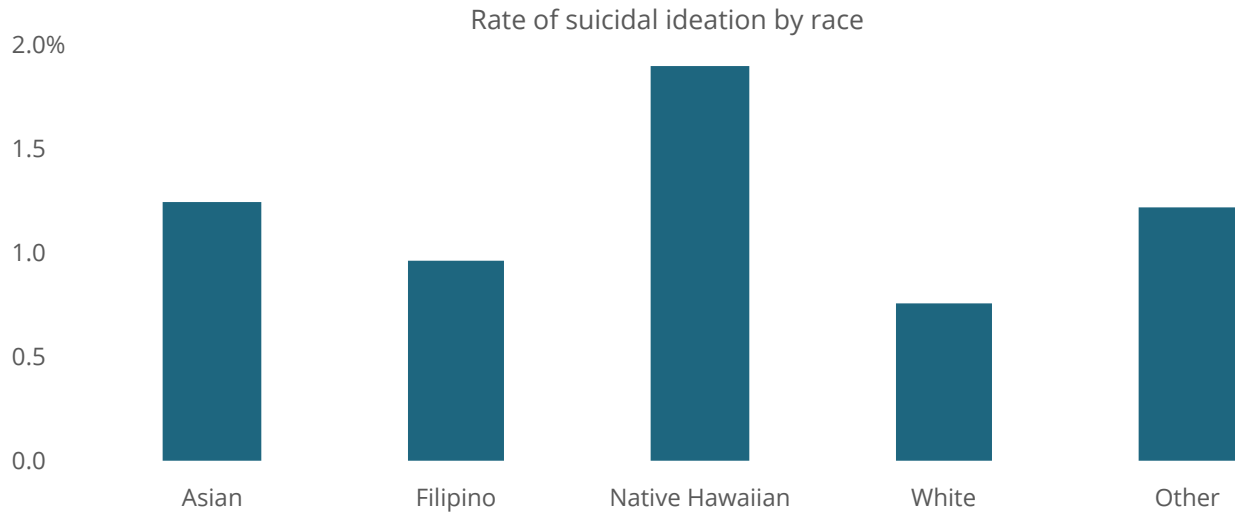
However, in contrast to November 2022, we found a difference in the rate of suicidal ideation between those who tested positive for COVID-19 and those who did not test positive. In particular, people who tested positive for COVID-19 reported higher rates of suicidal ideation (1.7%) than those who did not test positive (0.8%).



We found that younger people are more likely to seriously consider attempting suicide than older people. 5.6% of people aged 19-29 had suicidal ideation in the past month, which is significantly higher than the rate for people aged 70 and above (0.9%). No participant in our sample aged 50-59 seriously thought about suicide, whereas 1.8% of people aged 30-39 had serious suicidal ideation in the last month.

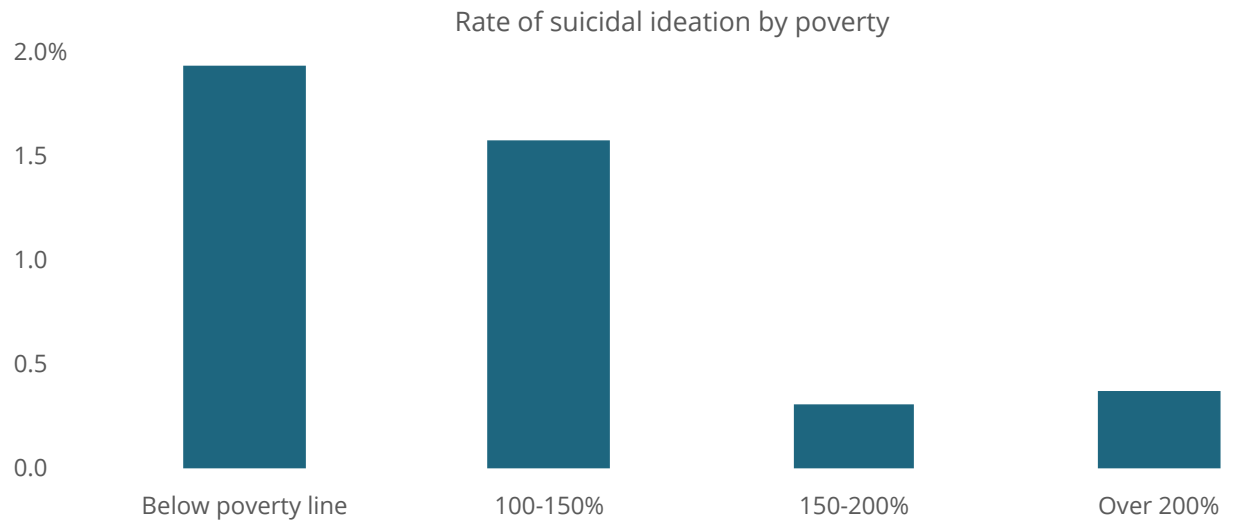


Between racial groups, Native Hawaiian and Asian people were more likely to have suicidal ideation than other races. 1.9% of Native Hawaiians seriously considered attempting suicide in the past month, followed by Asians (1.2%). 0.8% of White people had suicidal ideation in the past month.



Suicidal ideation by poverty level

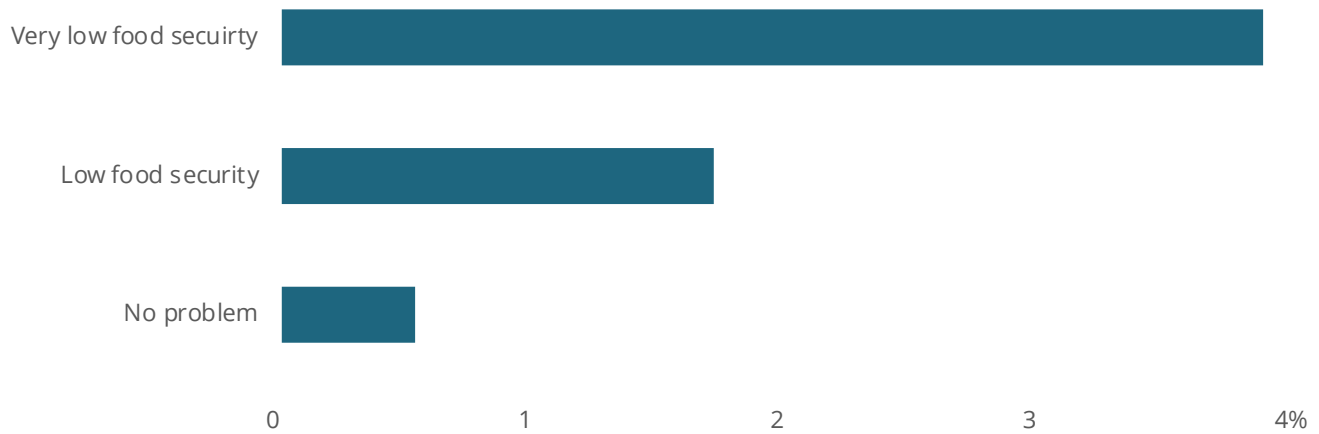
Suicidal ideation also differed by poverty level. People who are below the poverty line are more likely to have suicidal ideation than people with financial security. 1.9% of people below the poverty line had suicidal ideation, which is significantly higher than people with incomes over 200% of the poverty line. 1.6% of people with incomes of 100-150% of the poverty line seriously thought about suicide in the past month.



Suicidal ideation and food insecurity

People without food insecurity are less likely to have suicidal ideation. 0.5% of food secure people had serious suicidal ideation in the past month. By contrast, 3.9% of people who had very low food security reported serious suicidal ideation. 1.7% of people with low food security had serious suicidal ideation in the past month.

Rate of suicidal ideation by food security



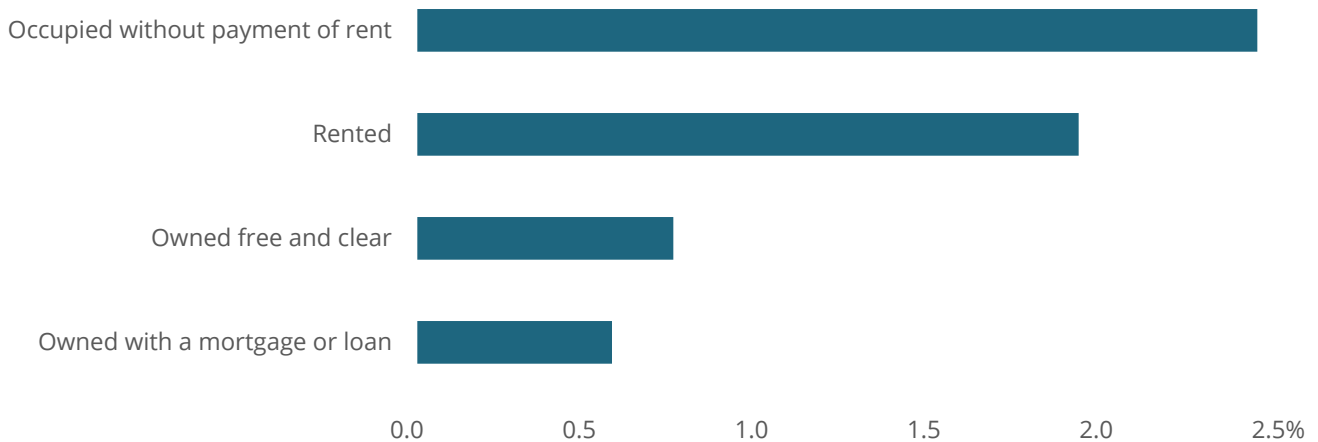
Suicidal ideation by housing condition

We also found the same pattern in the relationship between suicidal ideation and housing conditions.

Suicidal ideation and housing ownership

People who are living in a house without payment of rent (e.g., living in a shared space where someone else is paying rent) were the most likely to have suicidal ideation, at a rate of 2.4%. 1.9% of renters had suicidal ideation in the past month. Interestingly, people who live in their own house without a mortgage or loan have a slightly higher rate of suicidal ideation (0.7%) than people who are living in their own house with a mortgage or loan (0.6%).

Rate of suicidal ideation by housing status



Suicidal ideation and housing loss

Unsurprisingly, 11.1% of people who claimed lost or unstable housing have suicidal ideation. The rate of suicidal ideation of people without unstable housing conditions was only 1.0%.

Suicidal ideation and percentage of housing expenditure on income

People who spent higher rates of their household income on housing are more likely to consider attempting suicide. 2.06% of people who spent 50% or more of household income on housing had serious suicidal ideation. Conversely, only 0.78% of people who spent less than 20% of household income on housing had suicidal ideation.



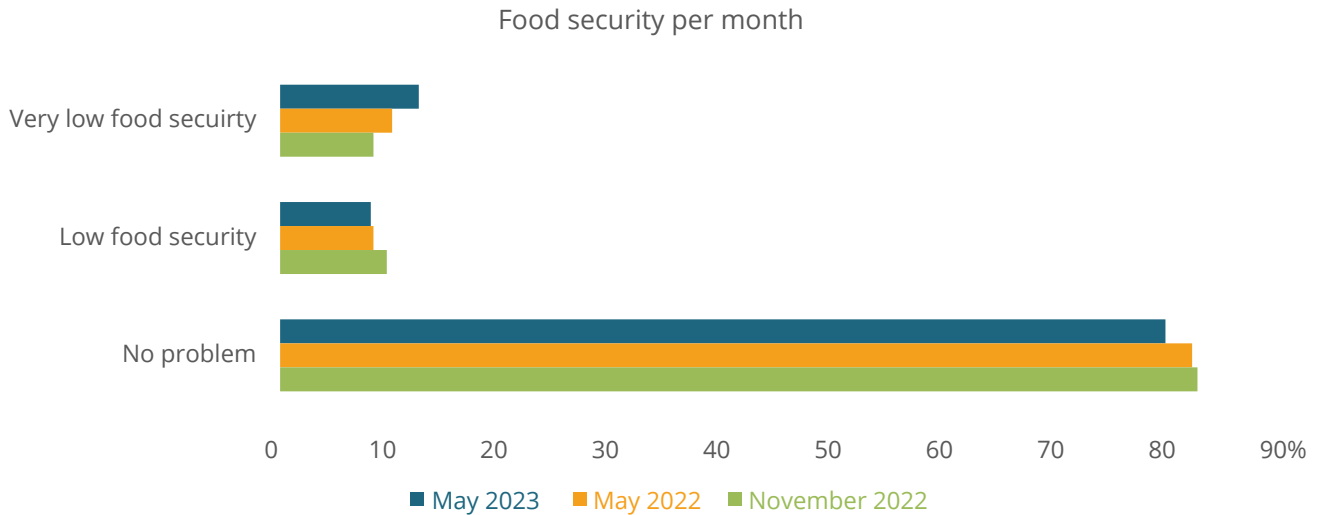
FOOD SECURITY

Approximately 80% of respondents reported no issues with food security. The percentage of respondents reporting low food security declined slightly to 8.1% (May 2023) from 9.6% (November 2022). However, the percentage of very low food security slightly increased from 8.2% (November 2022) to 12.5% (May 2023). Similar to the first two surveys, unemployed respondents were more likely to have low or very low food security compared to employed or retired respondents. Those who tested positive for COVID-19 were more likely to be food insecure than those who did not test positive.

These rates were largely associated with factors such as employment status, COVID-19 status, age, race, poverty level, and housing conditions. Unemployment, a positive COVID-19 test, younger age, certain ethnicities such as Native Hawaiians and Filipinos, living below the poverty line, and unstable housing conditions were all linked to higher food insecurity. In contrast, retirees, Asians, those with household incomes above 200% of the poverty level, and homeowners without a mortgage reported lower levels of food insecurity. A striking relationship was also observed between the proportion of household income spent on housing and food insecurity, highlighting the interconnected nature of financial stability, housing security, and access to food.

To measure food insecurity, we used the Six-item Food Security Scale developed by the National Center for Health Statistics. The index ranges from zero to six. Scores between zero and one are categorized as *No problem*; scores between two to four are categorized as *Low food security*; scores between five and six are categorized as *Very low food security*.

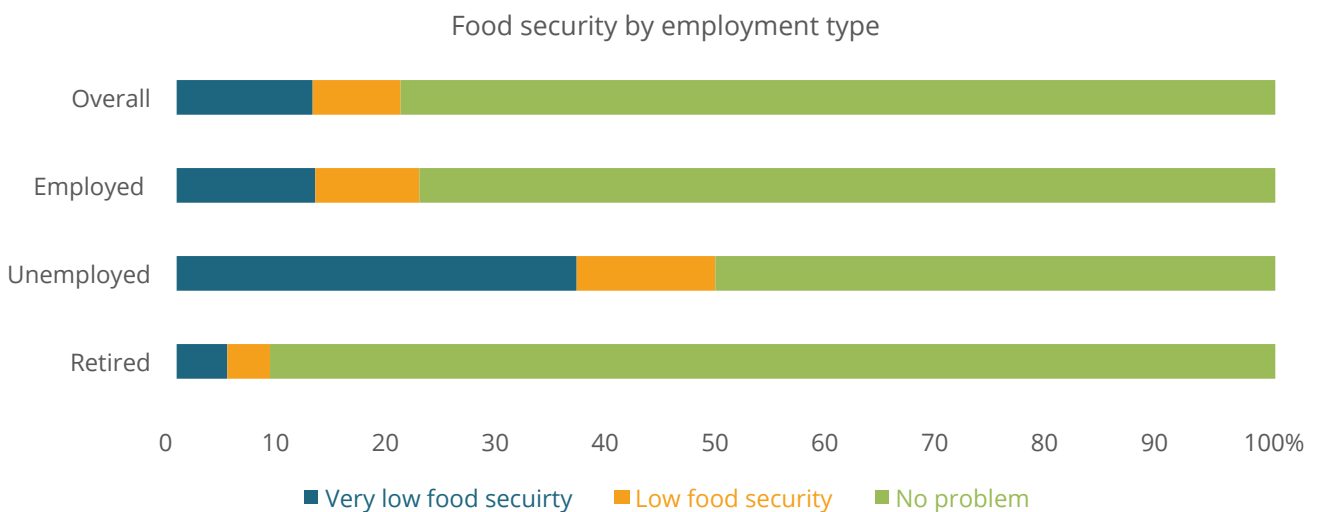
Descriptive statistics for food insecurity are reported below.



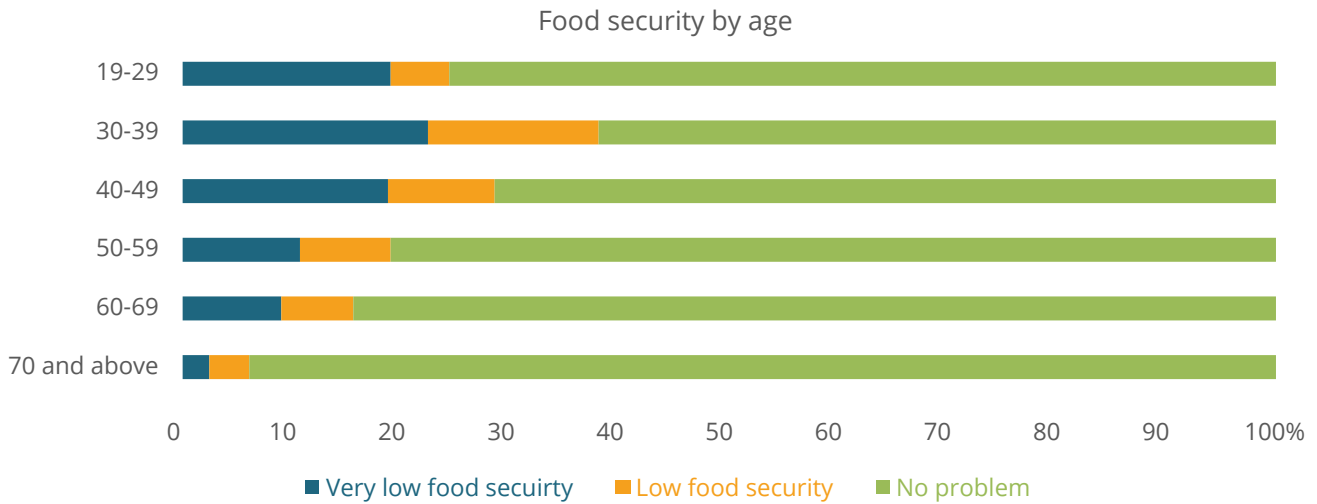
Similar to the surveys in November and May 2022, we found that around 80% of respondents had no issues with food security. The number of people experiencing low food security declined slightly to 8.1% while the number of people experiencing very low food security slightly increased to 12.5%.

Compared to employed people and retirees, unemployed people were more likely to have low and very low food security. 12.5% of unemployed respondents had low food security and 36.6% had very low food security. Only 4.1% of retired people had low food security and 4.6% of retired people had very low food security.

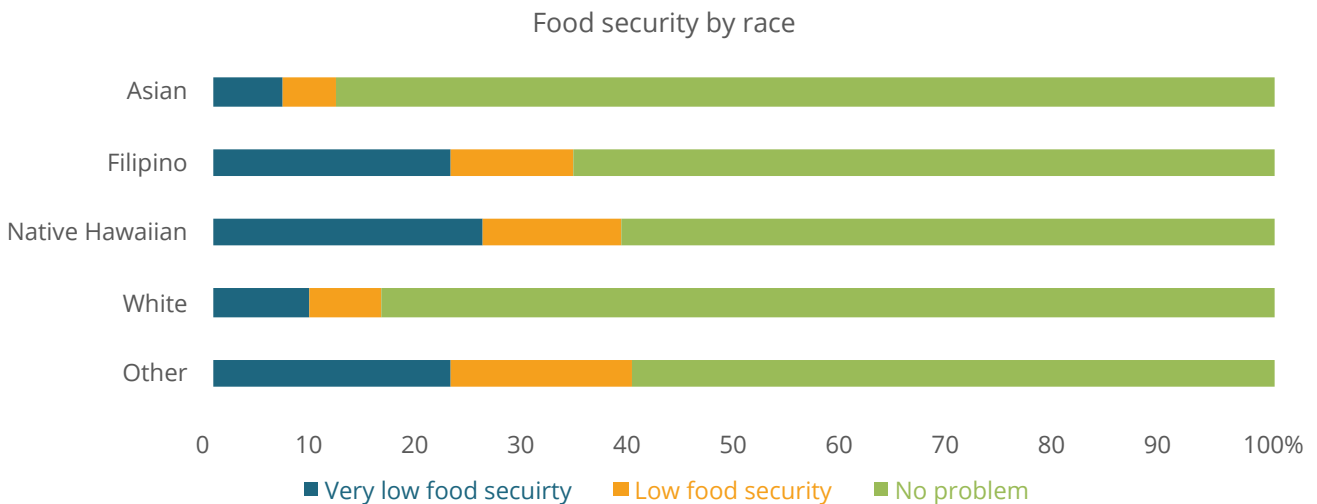
Respondents who got infected by COVID-19 had lower food security than those who never tested positive for COVID-19. This may reflect the possibility that COVID was more likely to impact people with low socioeconomic status or that COVID infections have repercussions for financial stability and the ability to afford food. The rate of low food security for people who tested positive for COVID-19 was 9.3%, while 19.0% had very low food security.



15.5% of people aged 30-39 had low food security while 22.5% had very low food security. The rate of very low food security was 18.9% for people aged 19-29, and 18.6% for people aged 40-49. 3.6% of people aged 70 and above had low food security, and only 2.3% had very low food security.



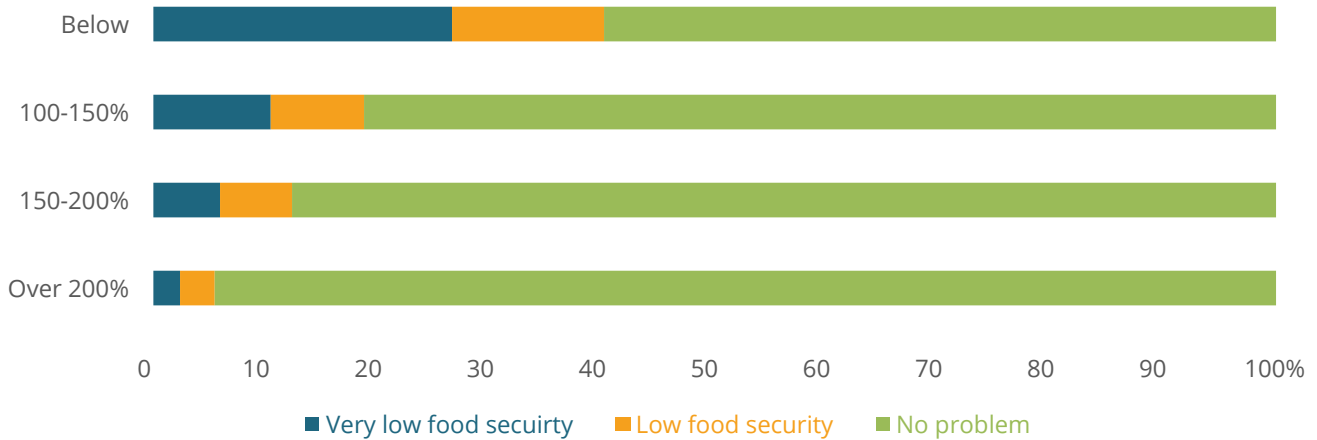
Asians were less likely to experience food insecurity. Only 4.8% of Asians had low food security, while 6.7% had very low food security. By contrast, Native Hawaiian and Filipino people were more food insecure. 25.5% of Native Hawaiians had very low food security, and 13.0% had low food security. The rate of low food security and very low food security for Filipino people were 11.7% and 22.3%, respectively. 84% of White people had no food insecurity.



Food insecurity by poverty level

Unsurprisingly, people who are below the poverty line were more likely to experience food insecurity than other income groups. 13.6% of people who are below poverty had low food security, and 26.6% had very low food security. By contrast, 3.0% of people who have household incomes over 200% of the poverty level had low food security, and 2.3% had very low food security. 10.3% of people who had household income 100-150% of the poverty level had very low food security, and 8.4% had low food security.

Food security by poverty level

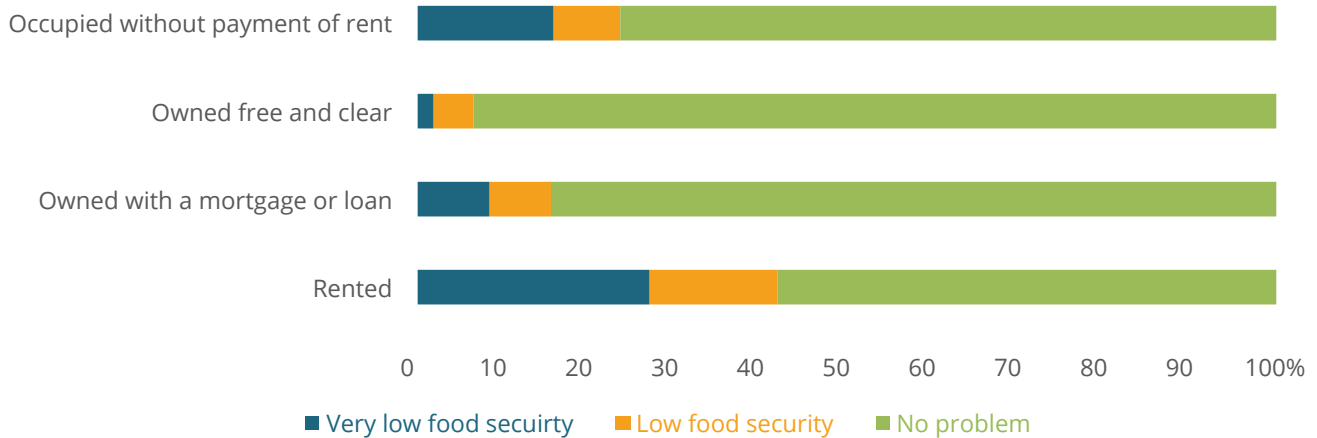


Food insecurity by housing condition

Food insecurity and housing ownership

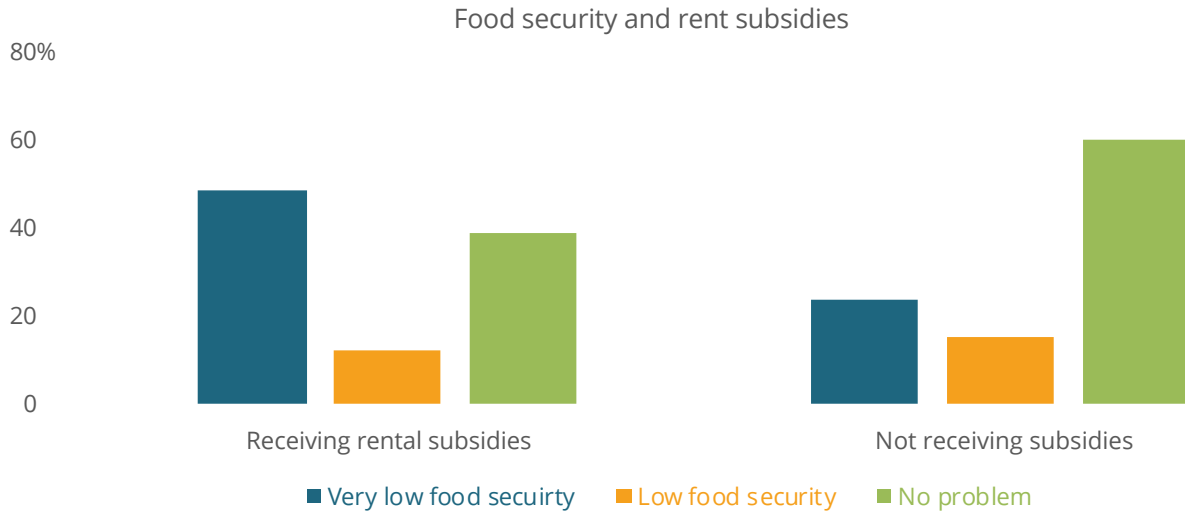
We also observed a relationship between food insecurity and housing ownership. Renters were more likely to experience food insecurity. 27% of renters had very low food security, and 15.1% had low food security. Similarly, people who are occupying their home without payment of rent are also suffering from food insecurity. Only 76.3% of these people are food secure, while 15.8% had very low food security. By contrast, homeowners without a mortgage or loan were more food secure. Almost 94% of these people do not experience food insecurity.

Food security by housing



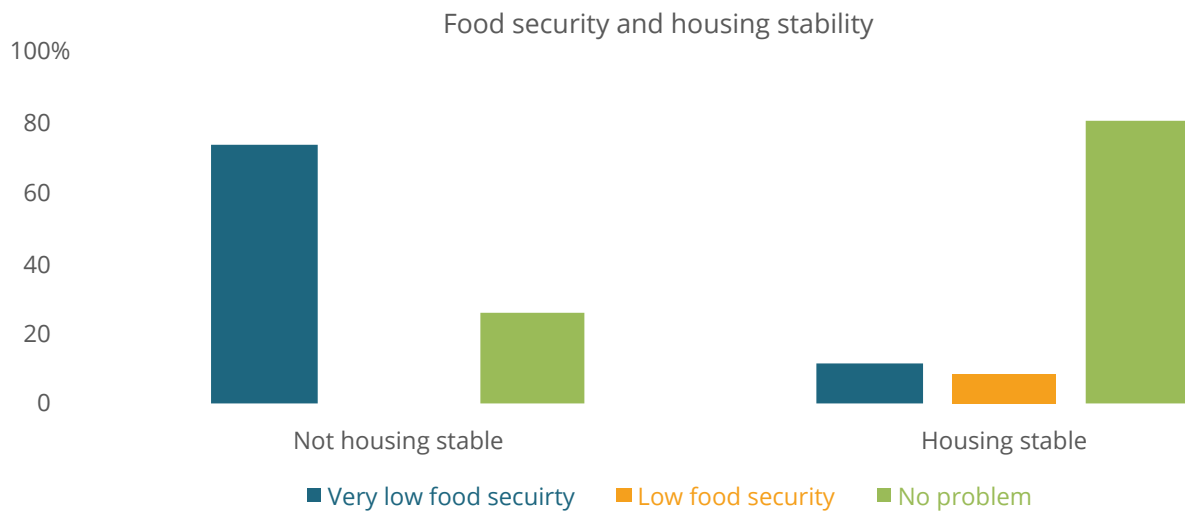
Food insecurity and housing rent payment subsidy

Noticeably, people who are renting and receiving a rent payment subsidy from the federal, state, or local government are more likely to experience food insecurity. Almost 49% of these people had very low food security, and 12.2% had low food security. By contrast, almost 61% of renters not receiving a subsidy were food secure. The rate of very low food security and low food security among this group were 24% and nearly 16%, respectively.



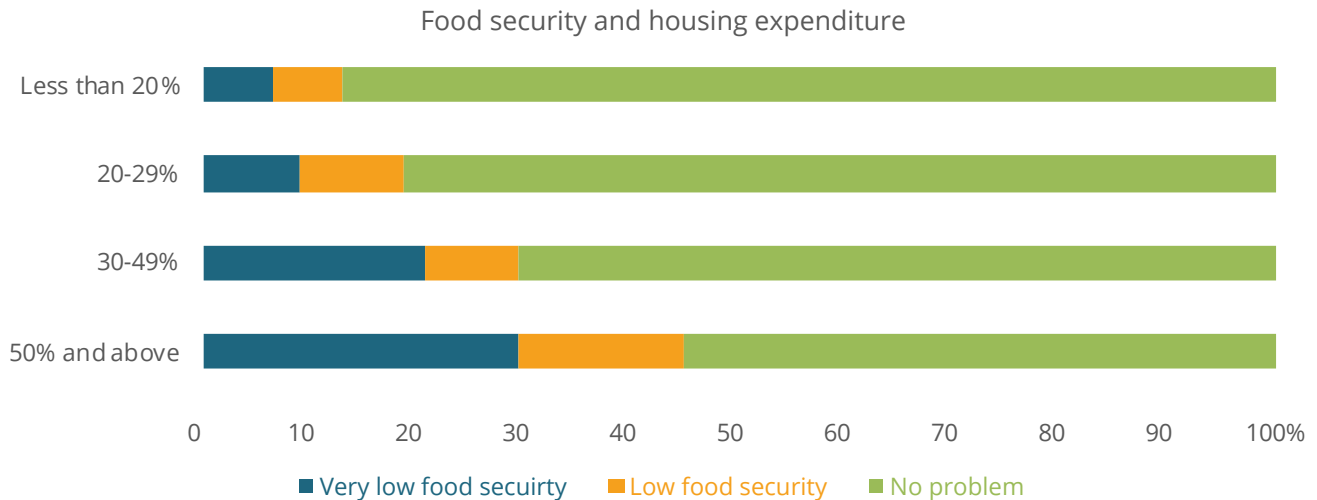
Food insecurity and housing loss

People who reported lost or unstable housing were more likely to experience food insecurity. More than 74% of these people had very low food security. By contrast, more than 80% of people with stable housing conditions are food secure. More than 11% of people with stable housing had very low food security and 8.3% had low food security.



Food insecurity and percentage of housing expenditure on income

We also found a strong correlation between food insecurity and rent to income ratios. People who spent less than 20% of their household income on housing were less likely to experience food insecurity. 6.4% of these people had very low food security and 6.4% had low food security. By contrast, 44.7% of people who spent 50% or more on housing did not have food security. 29.4% of these people reported very low food security. The rate of low food security of these people was 15.3%.



COVID-19 IN HAWAI'I

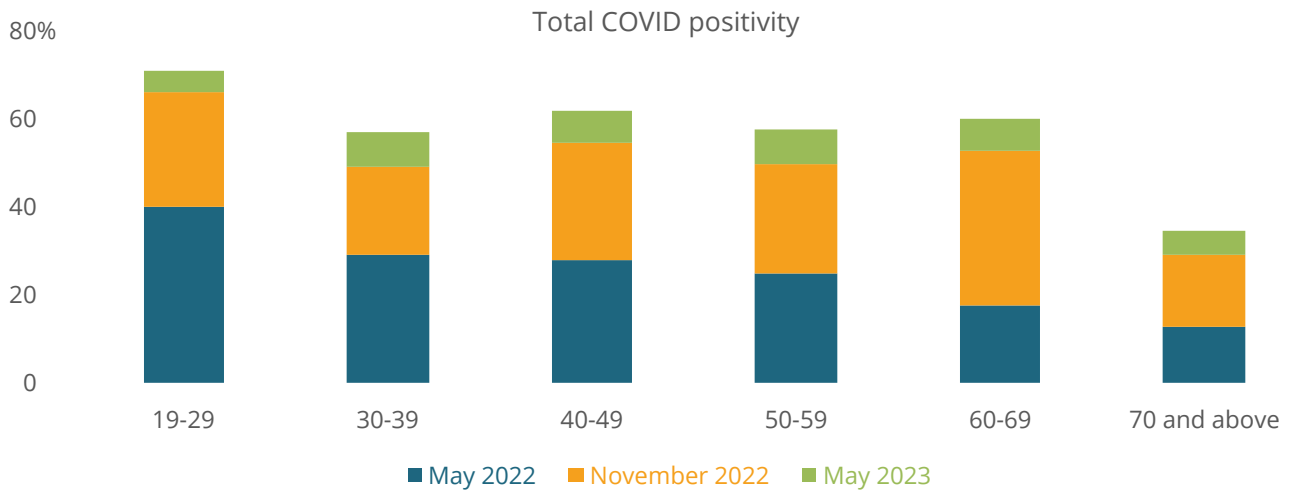
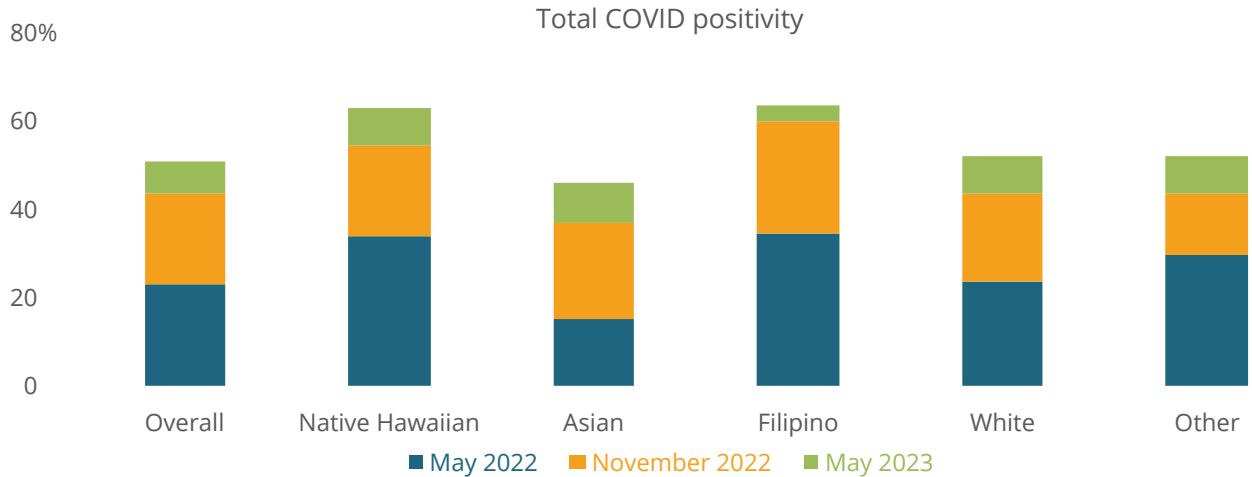
The latest survey in June 2023 revealed that 52.8% of respondents had tested positive for COVID-19 since the start of the pandemic, an increase from November's 45.3%. Racial and age-related disparities persist in COVID-19 positivity rates, with younger individuals and certain racial groups, like Native Hawaiians and Filipinos, displaying higher rates. Worryingly, the prevalence of long-COVID has risen to 35.4%, up from 30% in 2022. Notably, the severity of symptoms increased, particularly in instances of severe symptoms. Common long-COVID symptoms include coughing, shortness of breath, mental fog, headaches, and extreme fatigue. On average, respondents reported long-COVID symptoms persisting for approximately 3.5 months, slightly lower than the 4.35 months reported in Fall 2022. Meanwhile, optimism about the pandemic's course has grown, with only 5% of the cohort believing the worst is yet to come. The rate of long-COVID for unemployed individuals in May was 49%, whereas it was 28% for employed individuals. This gap has been increasing consistently over the last year.

COVID-19 Positivity Status

*COVID-19 positivity has increased since the last report. In November, **45.3%** of respondents had tested positive for COVID-19 at least once, compared to only **23.8%** in May 2022. Higher rates continue to be seen among younger adults, Native Hawaiian, Pacific Islander, and Filipino populations, as well as among unvaccinated and unboosted individuals.*

Due to an increase in at-home testing, the prevalence of COVID-19 via surveys is the most reliable way to estimate the spread of the virus in our communities. At the close of our survey in June 2023, 52.8% of our respondents reported a positive COVID-19 test result since the pandemic started, a significant increase from the 45.3% reported in November. However, the actual number of individuals infected by the virus is likely significantly higher due to asymptomatic cases.

The following graphs describe the positivity rate based on race and age. Racial disparities are also highlighted. We note differences in the positivity rate, with younger individuals, Native Hawaiians and Filipinos, reporting higher increases in positivity rates than others.



Long-COVID: Lingering long-term effects of COVID-19

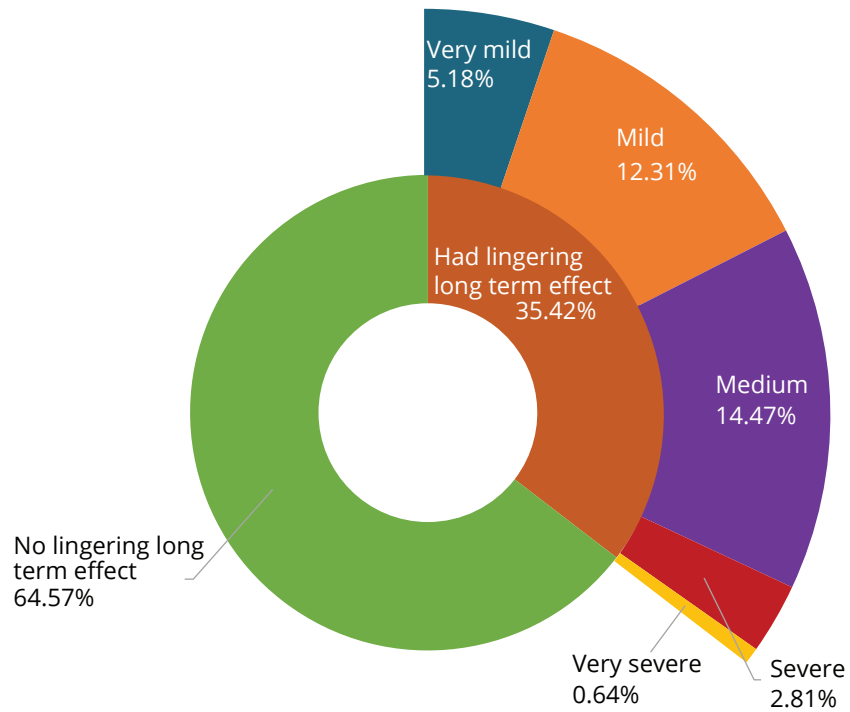
Long-COVID prevalence remains high. The overall rate of long-COVID increased to 35%, from 30% in Fall and Spring 2022. Coughing and shortness of breath, extreme fatigue and mental fog and headaches are present in over half the individuals who developed long-COVID.

The severity of lingering effects of COVID-19

According to the CDC, some people who have been infected with the virus that causes COVID-19 can experience long-term effects from their infection, known as post-COVID conditions (PCC) or “long-COVID”. Other terms used for “long-COVID” include long-haul COVID, post-acute COVID-19, post-acute sequelae of SARS-CoV-2 infection (PASC), long-term effects of COVID, and chronic COVID.

We asked respondents if they had any lingering long-term effects of COVID-19 that lasted for longer than a month. Of those who tested positive, over 35% reported lingering effects of the disease in Spring 2023, an increase of about 5% since Fall and Spring 2022. However, the severity of the lingering effects of COVID-19 changed. The share of people with very mild and medium symptoms was lower, while the percentage of severe symptoms significantly increased from 1.1% to 3.6% in the total population.

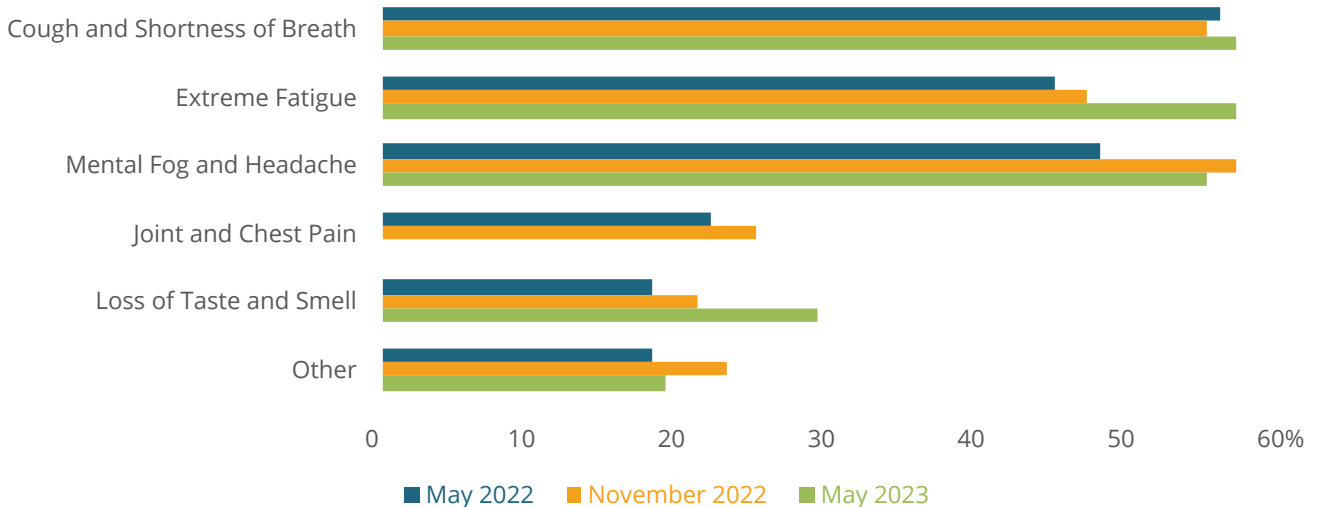
Have you had any lingering long term effects of COVID-19?
 How severe are the lingering effects of COVID-19?
 (May 2023)



Lingering effects experienced

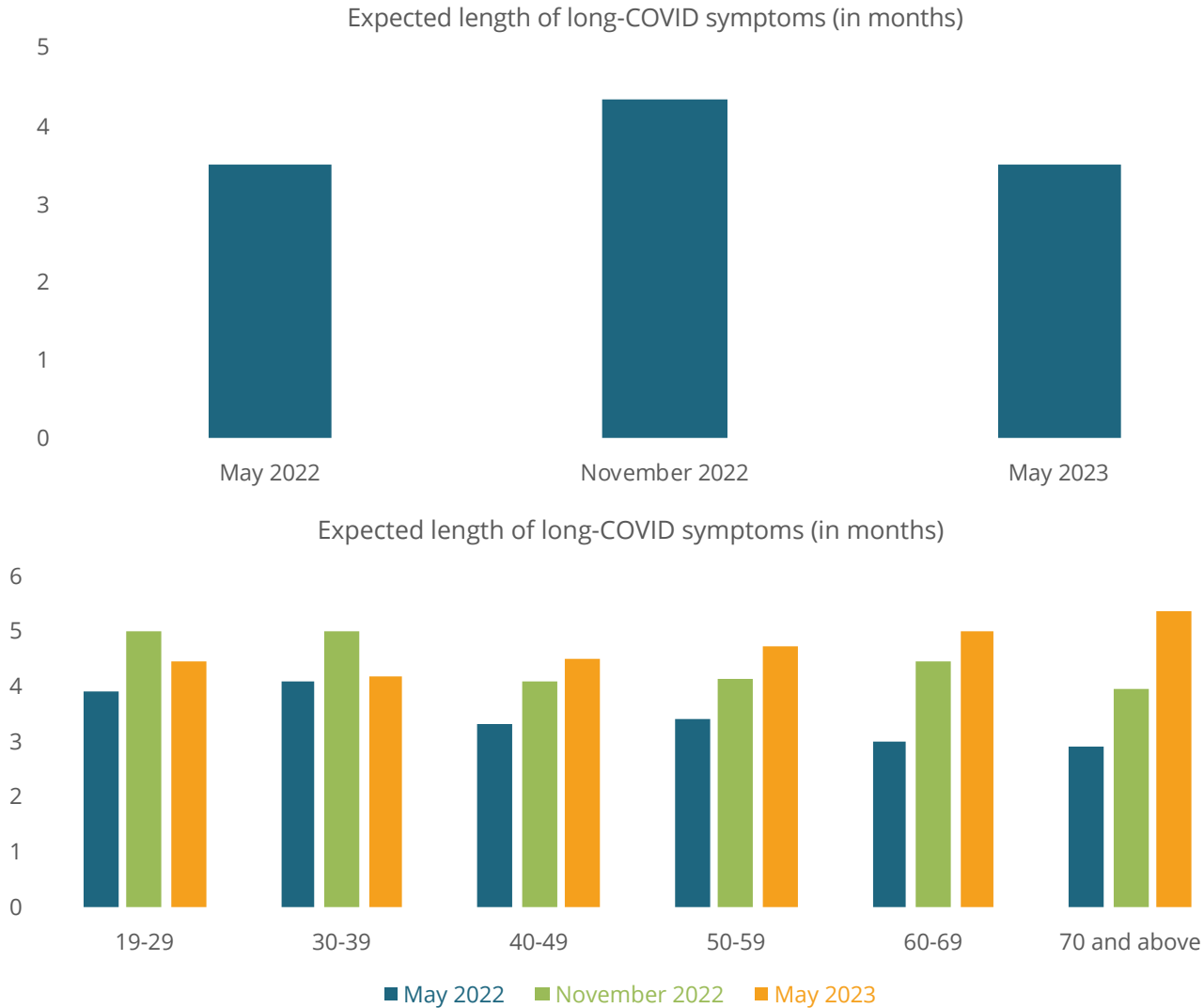
The most common symptoms of long-COVID and the change in long-COVID symptoms are reported below. Cough and shortness of breath (57.3%), mental fog and headache (55.5%), and extreme fatigue (57.3%) continue to be the most common symptoms of individuals infected with long-COVID. This is consistent with Fall and Spring 2022 surveys.

People who contracted COVID-19 often experience lingering effects from COVID-19.
 Have you had any lingering long term effects of COVID-19?



Length and severity of lingering effects

The figure below illustrates the change in the expected length of COVID symptoms between Spring 2022, Fall 2022 and Spring 2023. Compared to previous surveys, on average individuals reported lingering effects of COVID-19 for about 3.5 months in Spring 2023, a decrease from Fall 2022 (4.4 months). Older individuals tend to experience longer symptoms relative to younger individuals.



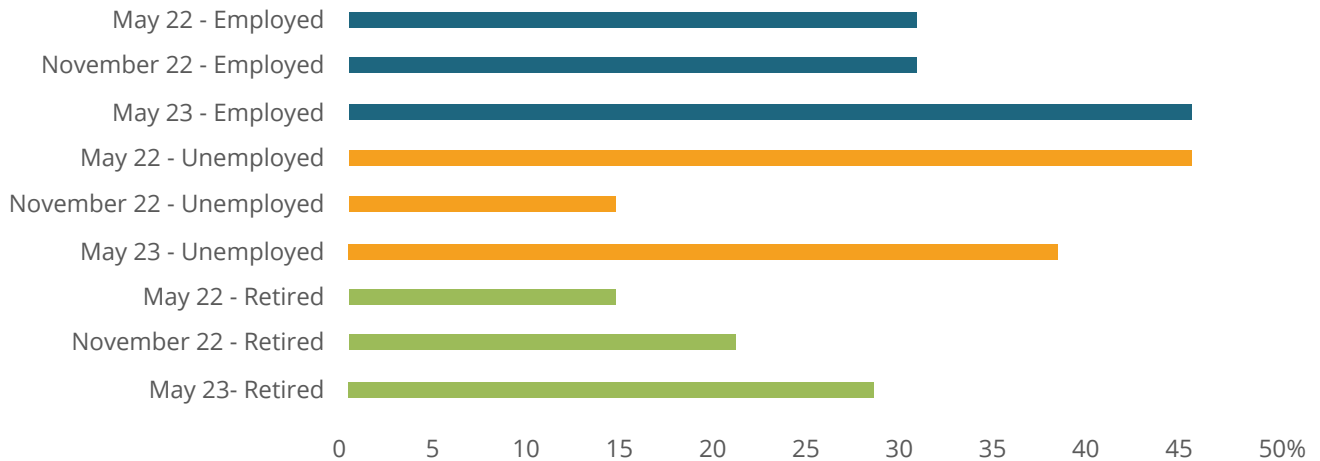
Long-COVID and Employment

Despite the rate of long-COVID being about 35%, unemployed individuals have a 48.9% rate of long-COVID, a 10-point increase since November.

The impacts of long-COVID on employment have been previously studied to ascertain to what extent ongoing symptoms impact individuals' ability to work. We find that in May 2023 an even higher proportion of individuals reported having both long-COVID symptoms and experiencing unemployment compared to May and November 2022. This data does not pinpoint the direction of the relationship between long-COVID and unemployment: people experiencing long-COVID may be more likely to become or persists being unemployed and/or people who are unemployed may be more likely to get infected with COVID and subsequently experience long-COVID.

The rate of long-COVID for unemployed individuals in May was 48.9%, whereas it was 28.1% for employed individuals. This gap has been increasing consistently over the last year, and has already been documented in an article by the coauthors.²

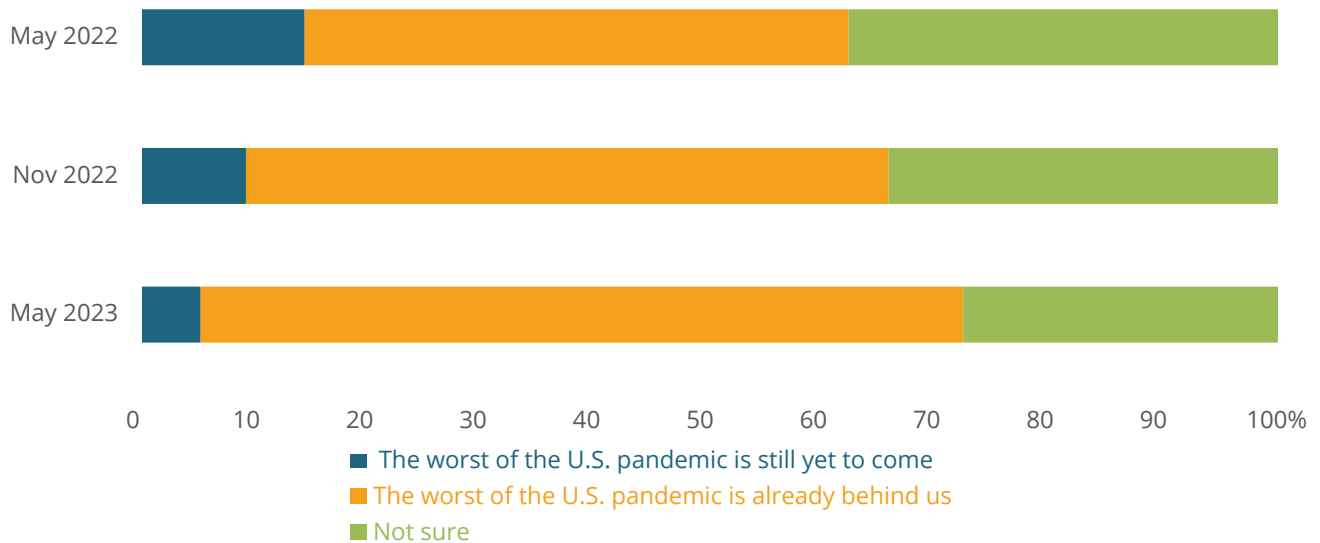
Long-COVID and employment



Perceptions of the future of the pandemic

Respondent's optimism that the worst of the pandemic is behind us has consistently increased since last year. Only 6.0% of respondents reported that the worst of the pandemic is still yet to come, a decline from the 9.1% and 14.5% in November and May 2022, respectively.

Which comes closest to your view of the COVID-19 pandemic?



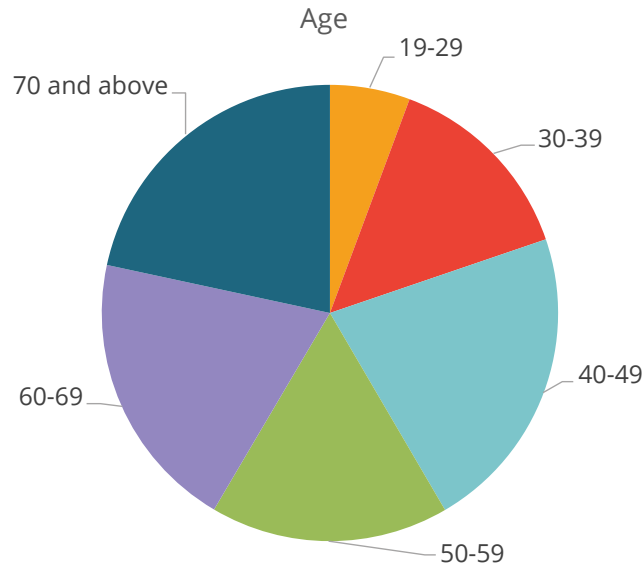
2 Bonham, C., Juarez, R., & Siegal, N. (2023). Long COVID and Unemployment in Hawaii. *International Journal of Environmental Research and Public Health*, 20(13), 6231.

DESCRIPTION OF SURVEY RESPONDENTS AND METHODOLOGY

Adult individuals who were part of the original cohort recruited in May 2022 and November 2022 were asked to complete a follow-up questionnaire in May 2023. Of the over 2000 adults invited to participate, 1,575 completed the follow-up survey and received a small payment for their participation. The retention rate was very high, at over 78.6%. We provide unweighted descriptive information on this sample below.

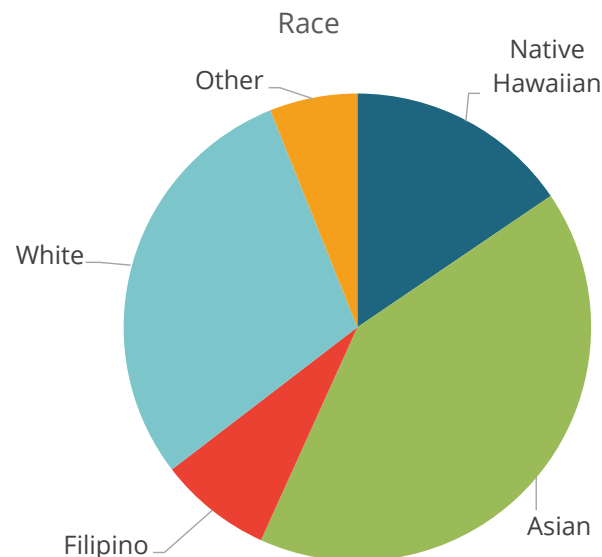
Age distribution

We depict the age distribution of the sample below. Notably, older populations, who are often difficult to recruit, are well represented, with over 41.5% of adults in our sample being 60 years or older. 21.8% of our sample are between 40 and 49 years old, while 16.9% of respondents are between 50 and 59.



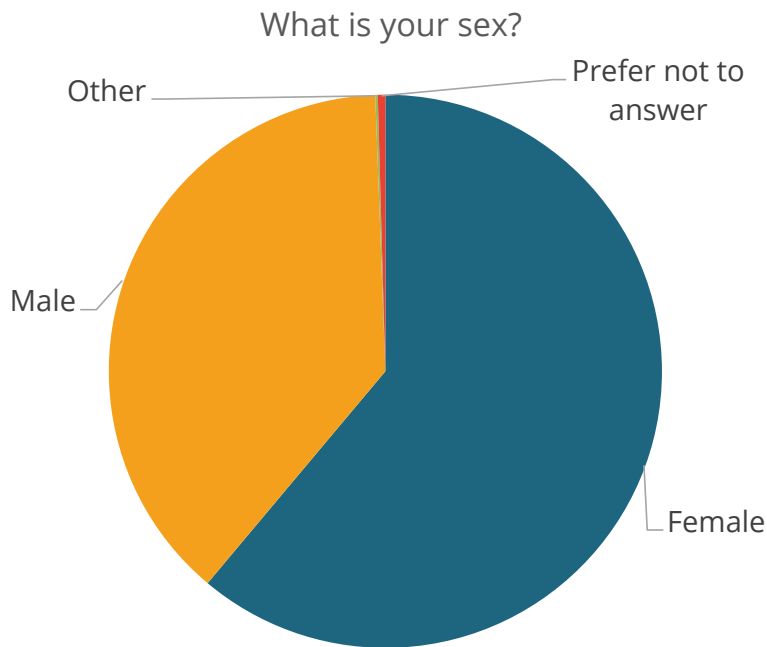
Race/Ethnicity distribution

We report descriptive statistics on the race and/or ethnicity of the sample respondents below. Respondents were asked to self-report their race or ethnicity, and in the case of multiple races, they identified the one that they associated the most with. All told, the survey captured the ethnic composition of the state reasonably well. Over 41% of our sample is self-defined as Asian (either Japanese, Chinese, Korean), followed by White (29.3%) and Native Hawaiian (15.5%). Filipino also represented 7.8% of our sample.



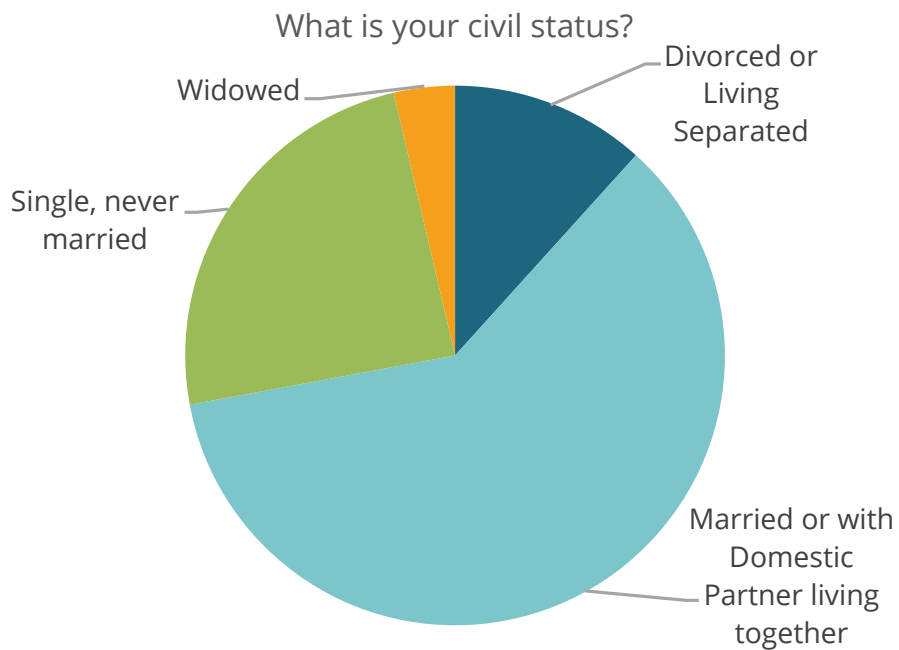
Gender distribution

Similar to the sample in November 2022 and May 2022, descriptive statistics on the gender of the sample respondents shows 61.1% of people identified as female and 38.3% as male, 0.1% identified as other, and 0.4% of the sample preferred not to answer.



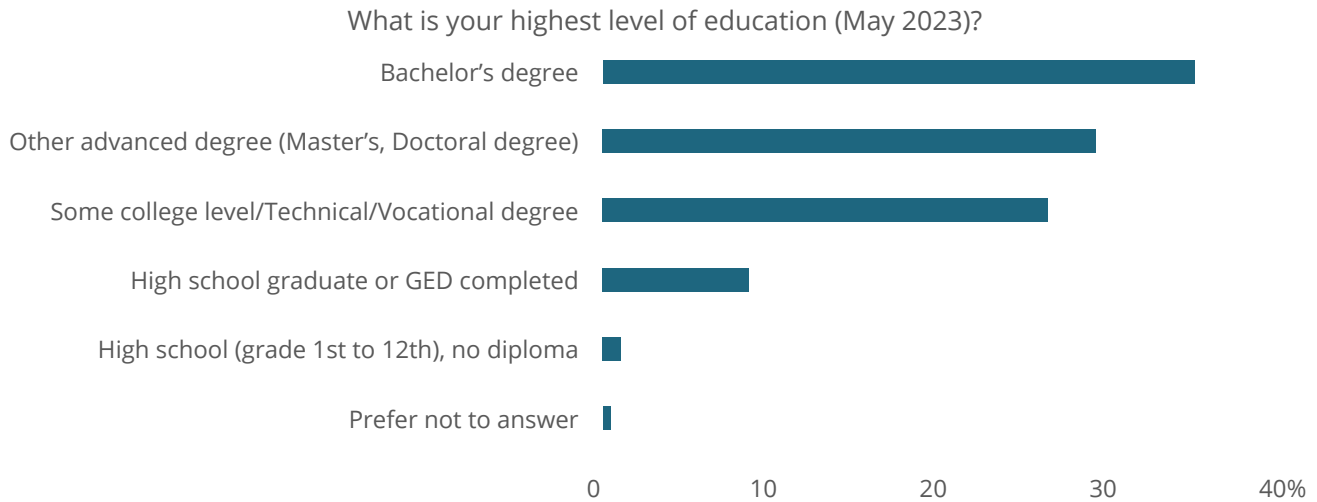
Civil status distribution

The participants are asked about their civil status. 60.4% of the respondents are married or living with a domestic partner. This is followed by people who are single, have never been married (24.3%), and are divorced or living separated (11.7%). Only 3.7% of the individuals are widowed. This civil status distribution is similar to the survey in November 2022.



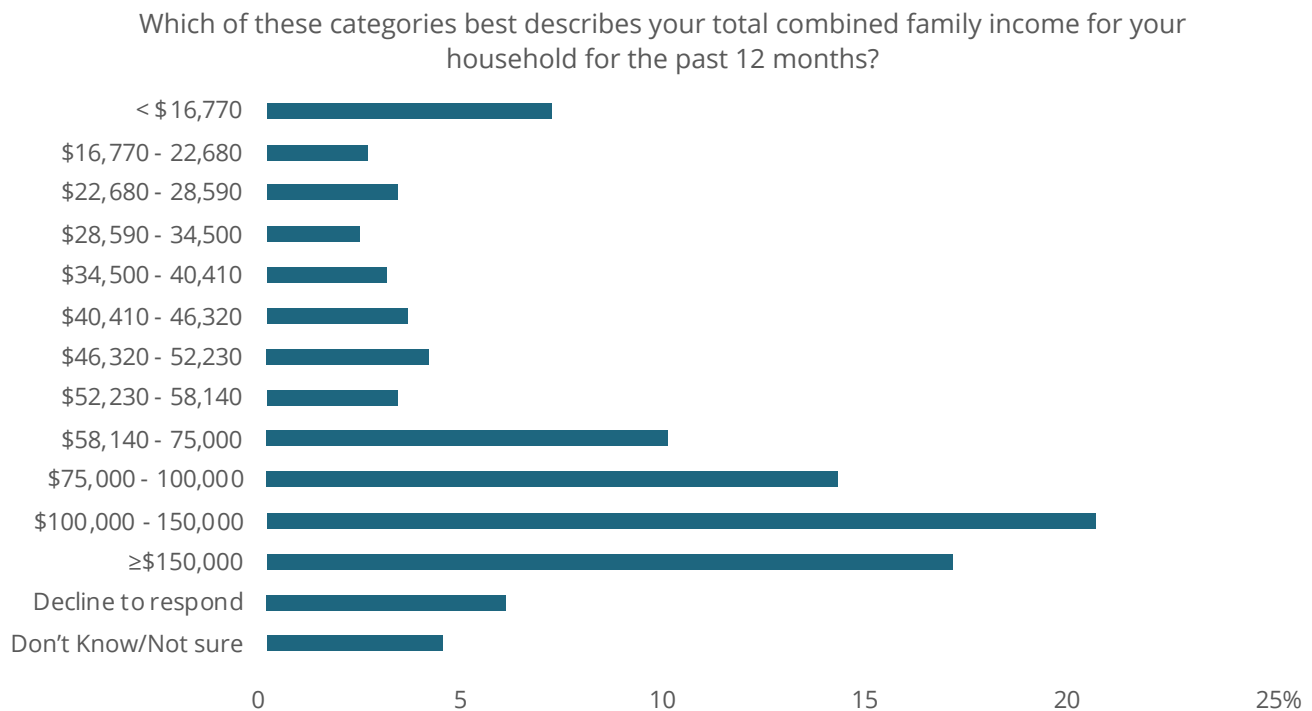
Education distribution

The figure below depicts the education profile of the survey respondents. 34.8% of respondents had a bachelor’s degree without a graduate degree. Almost 29% completed an advanced degree (Master’s, Doctoral degree). About 26.1% of the respondents have some vocational education or some other college level education. 8.6% of respondents had a high school or GED diploma. The distribution of education is relatively similar to the sample surveyed in May 2022 and November 2022.



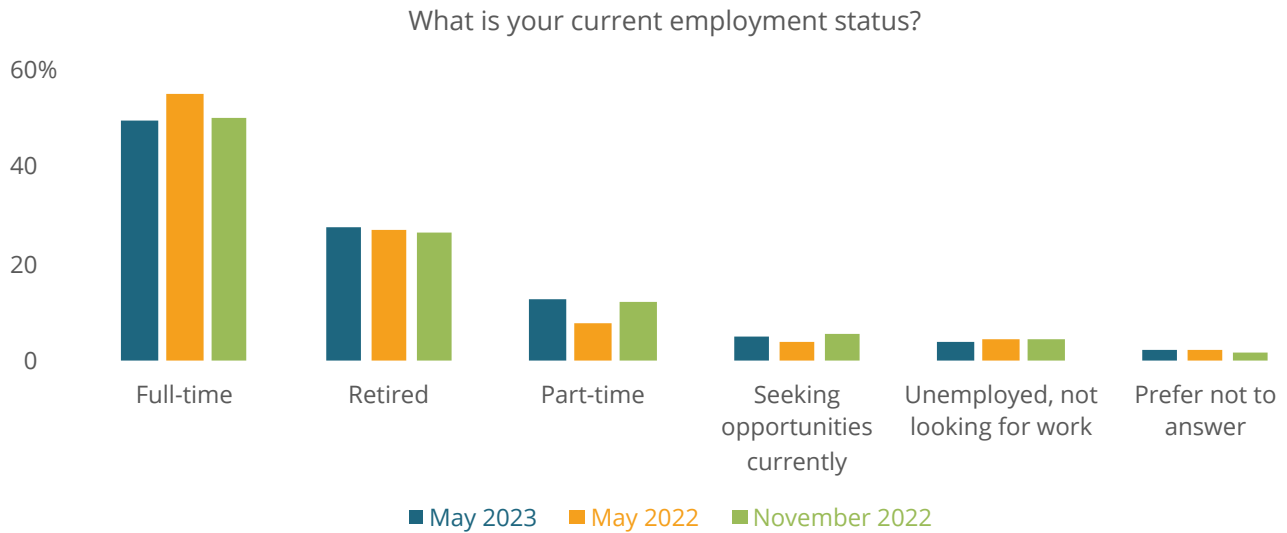
Household income distribution

The figure below shows the distribution of household income for respondents. Different from the surveys in May 2022 and November 2022, we collect the household income in more detail which is based on the poverty threshold by family size. We see that various earnings brackets were represented in the sample. More than 60% of respondents had a household income of \$58,140 and above. Among these people, 20.4% had a household income between \$100,00 and \$150,000, followed by people with household income of \$150,000 or more (16.9%). 7% of individuals have annual household income less than \$16,770. Around 10% of respondents declined to respond or do not know their annual household income.



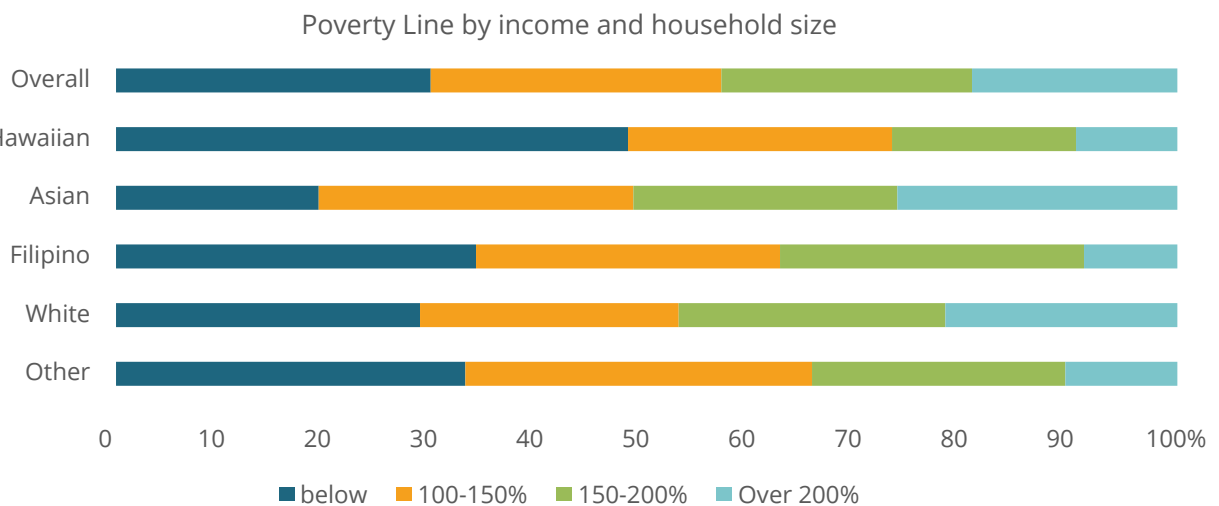
Employment status

We depict the distribution of employment status in the figure below. Almost 50% of the sample were employed full-time, while 12.6% were employed part-time. 27.5% of respondents were retirees. Compared to the survey in November 2022, the unemployment rate decreased slightly: the share of unemployed and seeking opportunities currently reduced to 4.6% and the share of unemployed and not looking for work reduced to 3.5%. 1.9% of the respondents preferred not to answer.



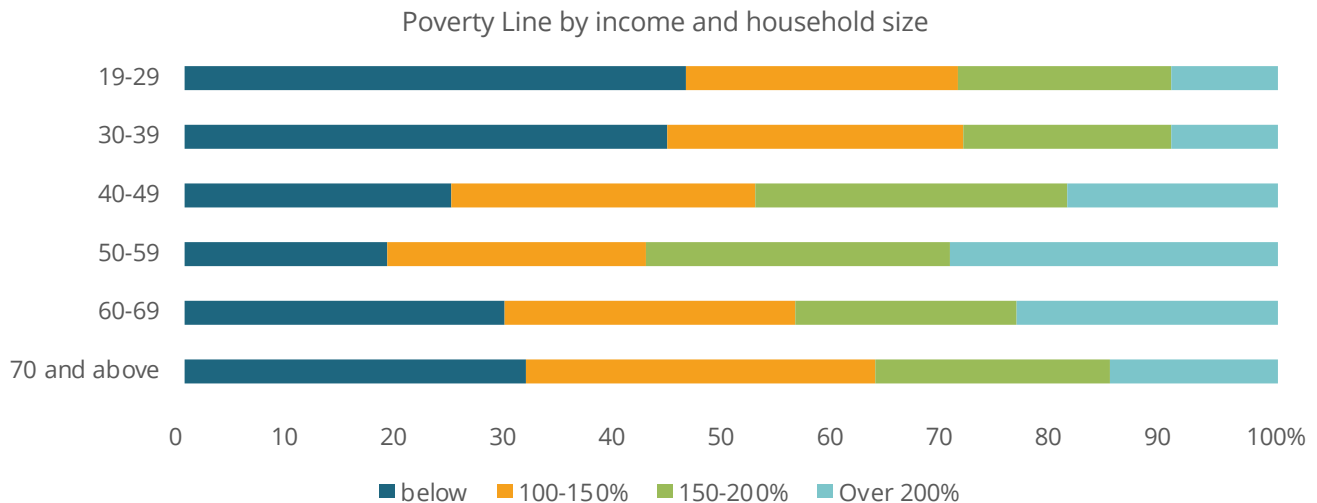
Poverty

Respondents reported their household sizes and incomes, which was used to determine their relation to the poverty line based on federal guidelines. 39.8% of respondents were found to be below the poverty line, with 27.5% having incomes 100-150% of this amount. Those over 200% are more likely to be financially secure, and made up 19.4% of respondents. Native Hawaiians had the highest rate below the poverty line at 48.4%, which was 29 percentage points higher than Asians and 19 higher than Whites. Asians were the most likely to have incomes 200% or more of the poverty line at 26.2%, followed by Whites at 21.9%. Native Hawaiians and Filipinos had the lowest percent at this income level, of only 9.5% and 8.8% respectively.



Poverty status also differed between age groups. As seen in many lifetime earnings graphs, younger and older people tend to have lower incomes and possibly larger household sizes due to young children still in the home or living in

multigenerational houses with their own children. Younger people aged 19-29 were the most likely to be below the poverty line at 45.8%, followed by those 30-39 at 44.1%. Middle aged people had the highest rates of incomes over 200% of the poverty line with those 50-59 at 30.0%, 60-69 at 23.8%, and 40-49 at 19.3%. People aged 19-39 were the least likely to earn over 200% of the poverty line at only 9.7%.



LIMITATIONS

Data from this survey was collected from a convenient sample of adults who responded to our invitation in June 2023 from our longitudinal cohort of over 2000 participants. In total, 1,575 individuals completed the survey in the Spring of 2023. We note the following limitations with regard to this data. First, as with any survey data, answers to questions are self-reported from the pool of participants. This could include people providing more socially desirable answers. Second, although the sample provided seems to have good coverage across all islands, age groups, and most races in the state, the sample cohort tends to be more educated than the state population as a whole, potentially biasing the estimates. Third, the data only provide a snapshot of the individual behavior changes over time from the surveys in May and November 2022 to June 2023, and include a limited number of metrics collected longitudinally. In reality, these limited metrics are not comprehensive of all the problems in the state, and their values can change over time. Fourth, people may be reluctant to factually answer questions about certain health behaviors, health outcomes and socioeconomic status, especially if these are perceived to be associated with social stigma, e.g. mental health. Such reporting biases may be more prevalent among certain age or racial groups. Finally, this report provides only descriptive analyses of the data. This does not represent causal relationships between the metrics studied, including mental health and unemployment. However, as we continue expanding the longitudinal sampling, we will have better indicators of causal relationships. Despite these limitations, we believe that this is some of the best current data available to date about individual behaviors, social determinants and health in Hawai'i. It sheds light on some of the pressing problems in the state, and it can provide valuable guidance for policymakers and the community.

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PAAC led efforts in several underserved regions of the state to expand COVID-19 testing while empowering educators, students, and the community at large with education tools and connections with public health services, including those provided by the AHARO Community Health Centers. The comments expressed in this report are the sole responsibility of the authors and do not represent the official view of the State of Hawai'i or NIH.

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