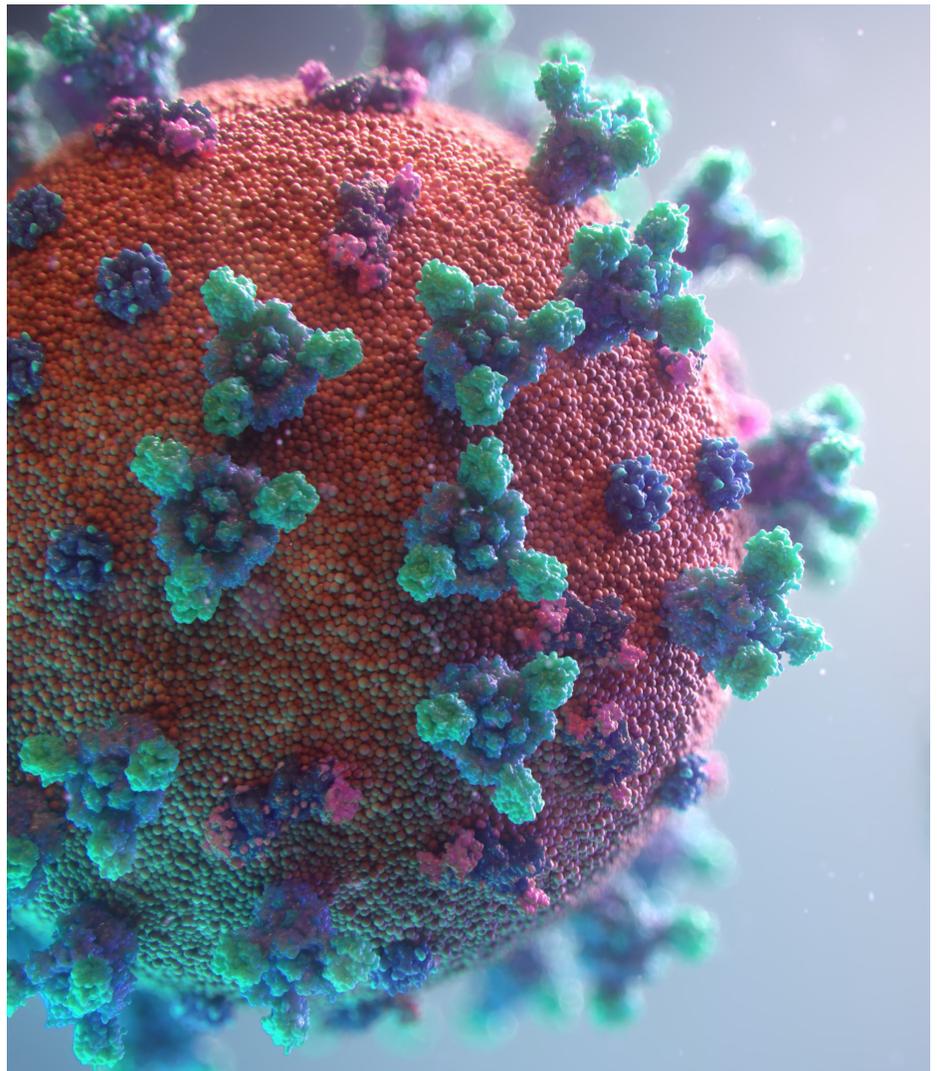




PUBLIC HEALTH REPORT

VACCINATION BOOSTER UPTAKE LAGS AS COVID IMPACT REACH WIDENS

JANUARY 5, 2023





UHERO

THE ECONOMIC RESEARCH ORGANIZATION
AT THE UNIVERSITY OF HAWAII

UHERO Public Health Report

Vaccination Booster Uptake Lags as Covid Impact Reach Widens

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EXECUTIVE SUMMARY

The UHERO Rapid Health Survey, in partnership with the [Pacific Alliance Against COVID-19 \(PAAC\)](#), conducted its second survey of more than 1600 Hawaii adults. Our key findings include the following:

COVID-19 outcomes and vaccination

- COVID-19 positivity has increased since the last report: In November, **45.5%** of respondents had tested positive for COVID-19 at least once, compared to only **24.8%** in May. Higher rates continue to be seen among younger adults, Native Hawaiian, Pacific Islander, and Filipino populations, as well as among unvaccinated and unboosted individuals.
- High vaccination rate and low booster shots among adults: **94.5%** of respondents are vaccinated, and of those, **52.9%** received one booster shot, and **34.4%** received two. Only **27%** of the sample received the bivalent booster shot.
- Long-COVID outcomes remain high: The overall rate of Long-COVID remained stable at close to **30%**, but more individuals reported severe or very severe symptoms in the Fall (**3.74%**) compared to the spring (**1.39%**). The expected length of symptoms increased by almost one month since the last report to **4.42 months**.
- Flu shot uptake is correlated with COVID-19 vaccination: **62%** of respondents have already gotten their flu shots, with an additional **8.4%** planning to get one. **77.3%** of COVID-vaccinated individuals have or plan to get a flu shot, compared to only **21.8%** of those COVID-unvaccinated. Among those COVID-vaccinated, **82.4%** of the people who received at least one booster shot have or plan to get a flu shot, compared to **43.1%** of those without any booster shots.

Perceptions and Views of COVID-19

- Perceptions of neighborhood/community safety against COVID-19 have risen: More people felt safe or very safe in the Fall (**68.7%**) compared to the Spring (**61%**). Unvaccinated people are more likely to feel safer than vaccinated respondents.
- Fewer people are willing to take COVID-19 precautions: Fewer people would be willing to take some precautions if there were to be a future wave of COVID-19: social distancing in public (**5.5 percentage point decrease**), wearing a mask in public indoor spaces (**2 percentage point decrease**). Nearly **10%** more respondents believe the worst of the pandemic is already behind us. There was a **14.5 percentage point increase** in those who believe COVID-19 is over for their personal lives, and a **6.2 percentage point increase** in those who believe the pandemic should be considered over.
- Some people feel COVID-19 Fatigue: Signs of COVID fatigue are present in our populations. The highest levels were found among those unvaccinated (**2.10** out of 4) and those vaccinated without booster shots (**1.97** out of 4). The lowest scores were seen for those with booster shots (**1.46** out of 4) and older adults (**1.33** out of 4).

COVID-19 Impacts

- The impact of the COVID-19 pandemic continues to increase since May 2022: **28.6%** of the individuals reported having their savings depleted, **13.6%** were unable to pay bills, and **9%** did not have enough food in their household. **4.4%** of the individuals lost their jobs, and **7.2%** of the individuals were furloughed or reduced their working hours since May 2022.

- Long-COVID is negatively affecting employment: Despite the rate of long-COVID being about 30%, unemployed individuals have a **47%** rate of long-COVID, a 5-point increase since May.
- Depression symptoms remain high but stable: Rates of depression symptoms remained stable since May, at about **1 in 3** adults reporting depression symptoms. Unemployed people had a rate of **46.8%** had depression symptoms, compared to **33.7%** for employed people and **22.7%** for those retired.
- Individuals impacted by the pandemic are more likely to have higher depression symptoms. 68.9% of highly depressed people had their savings depleted, while only 41% of those with some symptoms and 21.1% of those without symptoms reported depleted savings. Higher depression symptom respondents were more likely to report an inability to pay bills and rent, as well as struggling to provide enough food at higher rates as well.
- Self-esteem remained stable: About **1 in 10** adults report low self-esteem, a similar rate as in the previous report in May.
- Suicidal ideation decreased: There was a **2.5** percentage point reduction in the number of respondents reporting having suicidal ideation in the past month in Fall compared to Spring. Unvaccinated individuals had a higher rate at **5.7%**, compared to the vaccinated rate of **1.5%** in the Fall survey.
- Race disparities were observed in mental health outcomes: Korean and Japanese respondents had the best mental health outcomes, while Native Hawaiian, Latino, and Native American respondents had the lowest mental health outcomes.
- Food insecurity remained high but stable: The percentage of respondents reporting low food security reduced slightly to **8.2%** from 8.4% in May.

Overall, as we enter a new phase of the pandemic, Hawai'i's populations are becoming more confident that the worst of the pandemic is behind us, driving COVID-19 booster uptake down. However, significant impacts exacerbated by the pandemic, including long COVID, mental health issues, and the prevalence of other comorbidities, may pose significant challenges that warrant monitoring. In anticipation of those challenges, the infrastructure laid down to support COVID-19 mitigation efforts may be leveraged, raising a need for with renewed strategic planning activities.

INTRODUCTION

The UHERO Rapid Health Survey is building the data infrastructure at the University of Hawai'i Economic Research Organization to inform the design and execution of public health programs in Hawai'i for COVID-19 and other disasters while simultaneously addressing systemic health disparities. To date, we have a statewide cohort of over 2000 adult residents in the state that we follow longitudinally. In the first [UHERO Public Health Report \(June 2022\): Health Effects and Views of COVID-19 in Hawai'i](#), we reported the adverse impacts that the COVID-19 pandemic had on Hawai'i's populations, from mental health, food security, and long-covid, among others. The report also revealed the views and perceptions of individuals about the COVID-19 pandemic.

As Hawai'i is transitioning life back to normal, despite some recent surges over the last weeks, we report the second results of the cohort collected in Fall 2022, obtained in partnership with the support of the team at the [Pacific Alliance Against COVID-19](#).

For this report, we include responses from 1627 out of 2030 Hawai'i adults aged 18 and above who were enrolled in the study during May 2022. Respondents were distributed from all four counties in the state of Hawaii.

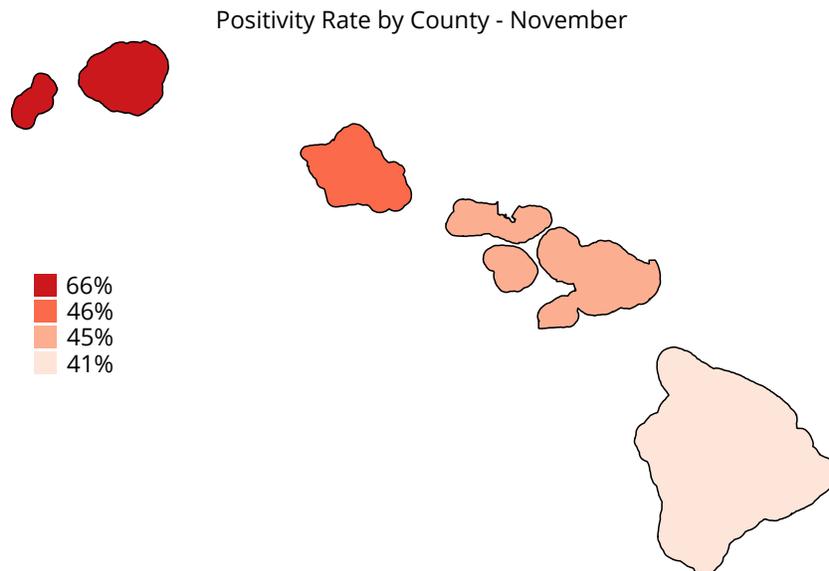
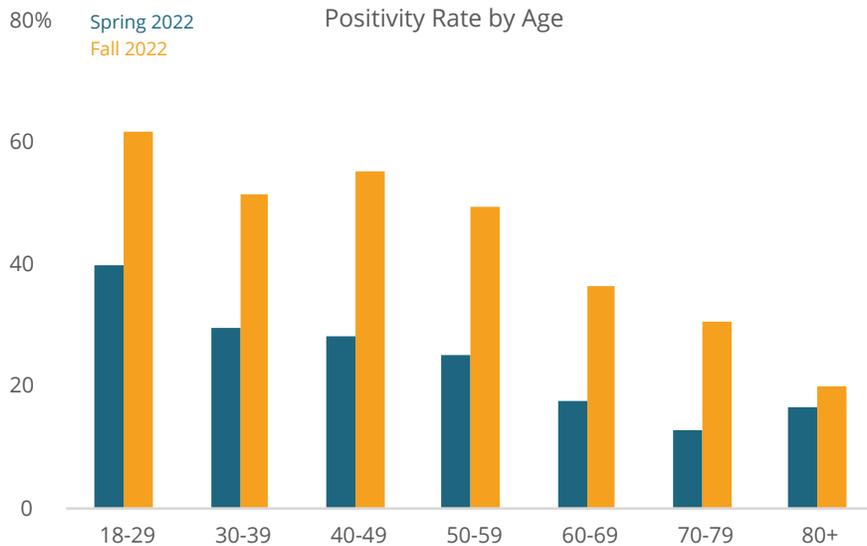
COVID-19 OUTCOMES AND VACCINATION

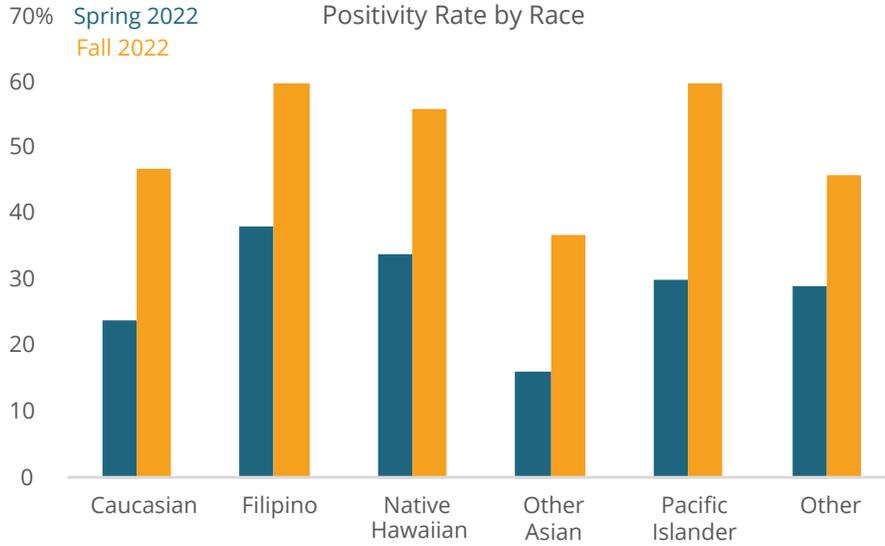
COVID-19 Positivity Status

COVID-19 positivity has increased since the last report. In November, **45.5%** of respondents had tested positive for COVID-19 at least once, compared to only **24.8%** in May. 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 November, 45.5% of our respondents reported a positive COVID-19 test result since the pandemic started, a significant increase from the 24.8% of adults who reported a positive COVID-19 test back in May. This is likely due to the significant rise of Omicron cases over the summer. However, the actual number of individuals infected by the virus is likely significantly higher.

The following graphs describe the positivity rate based on age, county of residency, and race. Racial disparities are also highlighted. We note differences in the positivity rate across counties, with larger rates in Kauai and Oahu than in Maui and Hawaii counties. In addition, younger individuals, Native Hawaiians, Pacific Islanders, and Filipinos, report higher increases in positivity rates than others.



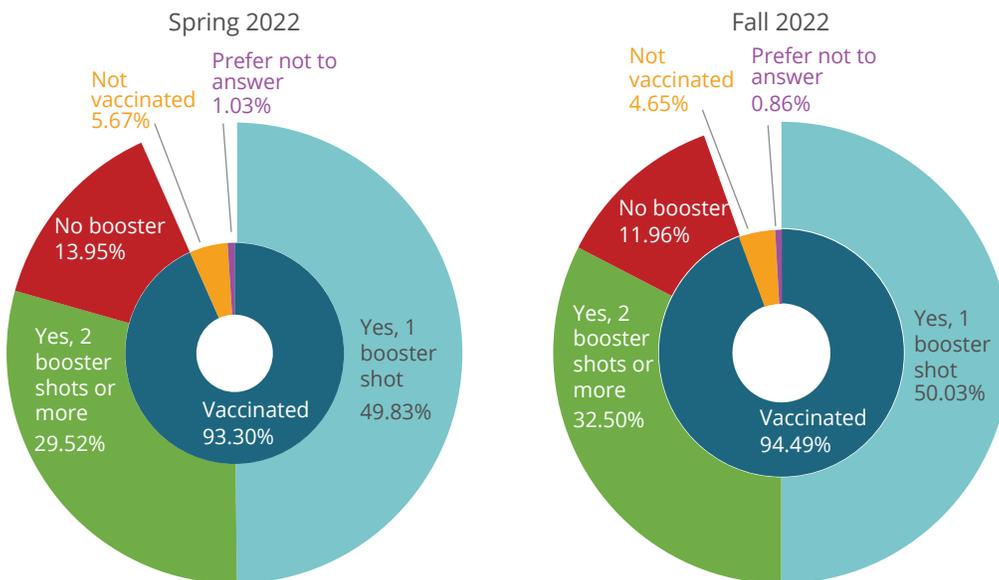


Vaccination and booster shot uptake

Respondents report a high vaccination rate yet low booster shot uptake among adults: **94.5%** of respondents are vaccinated, and of those, **52.9%** received one booster shot, and **34.4%** received two. **27%** of the sample has received the bivalent booster shot. Less than **5%** of the sample remains unvaccinated.

Hawai'i has one of the highest adult vaccination rates in the country, and this is borne out in the sample. Compared to Spring 2022, the vaccinated population and the population with two or more booster shots have increased across the state. We show that 94.5% of respondents received at least one COVID-19 vaccine shot by Fall 2022. Of the vaccinated, 52.9% (or 50% of total respondents) received one booster shot, whereas 34.4% (or 32.5% of total respondents) received two or more booster shots. In comparison, 93.3% of the total population was vaccinated and 29.5% had received 2 booster shots or more in Spring 2022.

Have you received a COVID-19 vaccine? Have you received your COVID-19 booster shot?



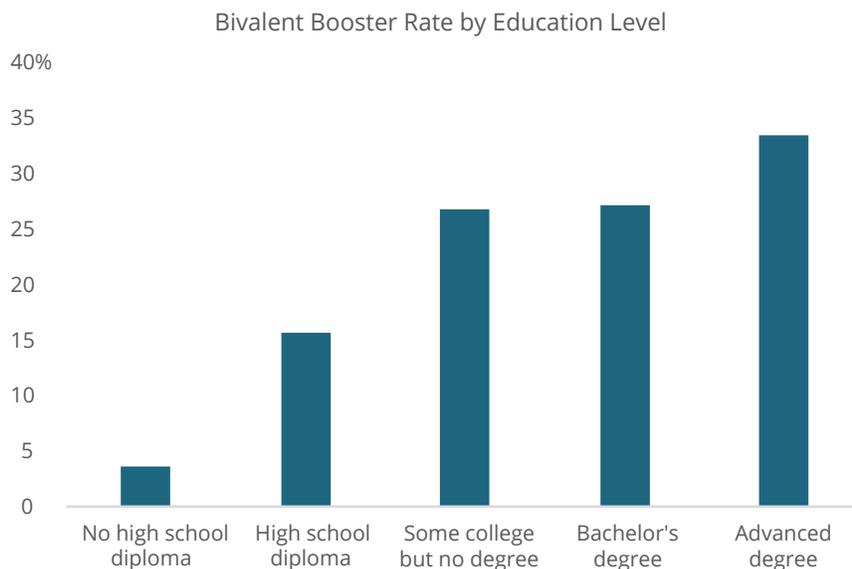
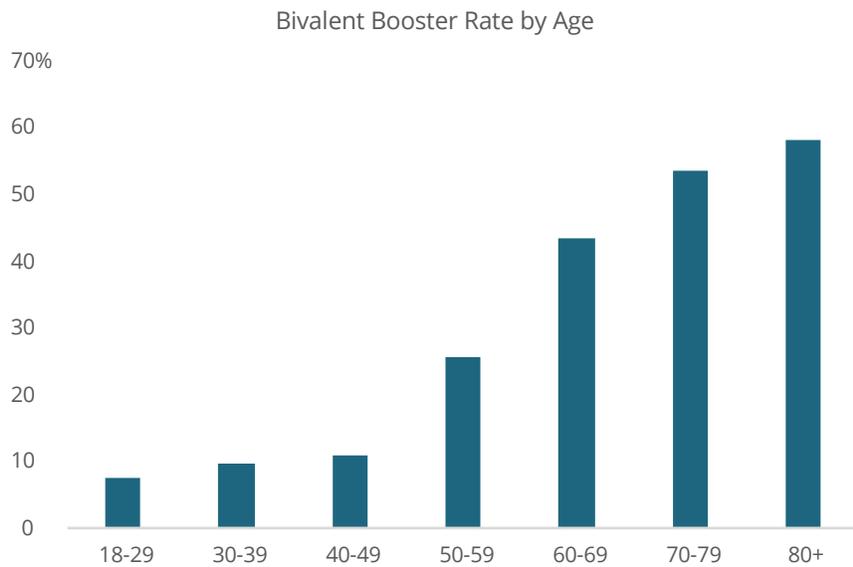
Who has received the bivalent booster?

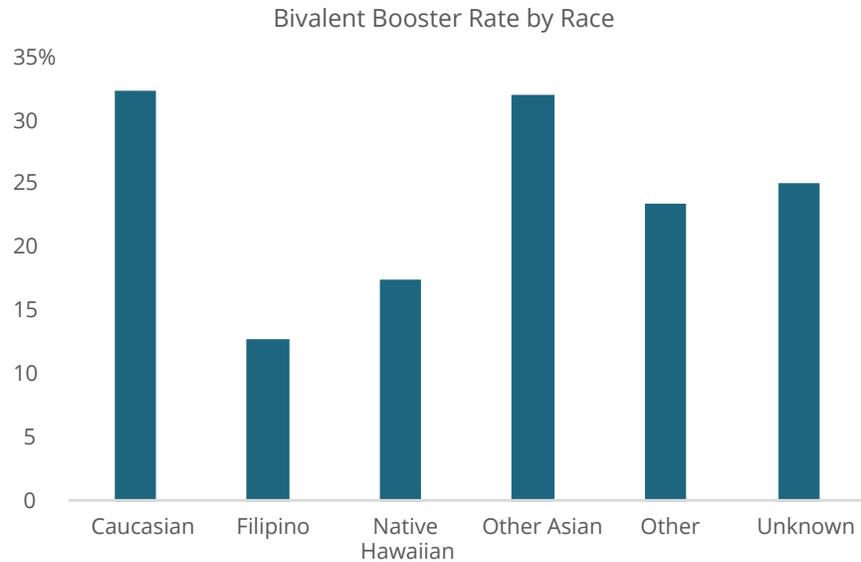
27% of participants in our sample have received the bivalent booster shot as of November 2022. Disparities are observed in age, education level, and race.

Individuals with a bivalent booster shot tend to be older participants. Individuals older than 60 reported a bivalent booster rate above 40% in November. In contrast, less than 20% of individuals under 50 years old got a bivalent booster.

Education is an important factor related to vaccination status, with participants who are getting the bivalent booster shot tend to be more educated. Individuals with an advanced degree, bachelor's degree, and some college education report high rates of getting a bivalent booster shot, around 30% in November. On the other hand, individuals with a high school diploma and no high school diploma report a 16%, and 3% likelihood of getting a bivalent booster shot, respectively.

Racial and ethnic disparities are also observed. Among Caucasians and non-Filipino Asians, more than 30% got a bivalent booster shot, while the rates of other races are below 30%.



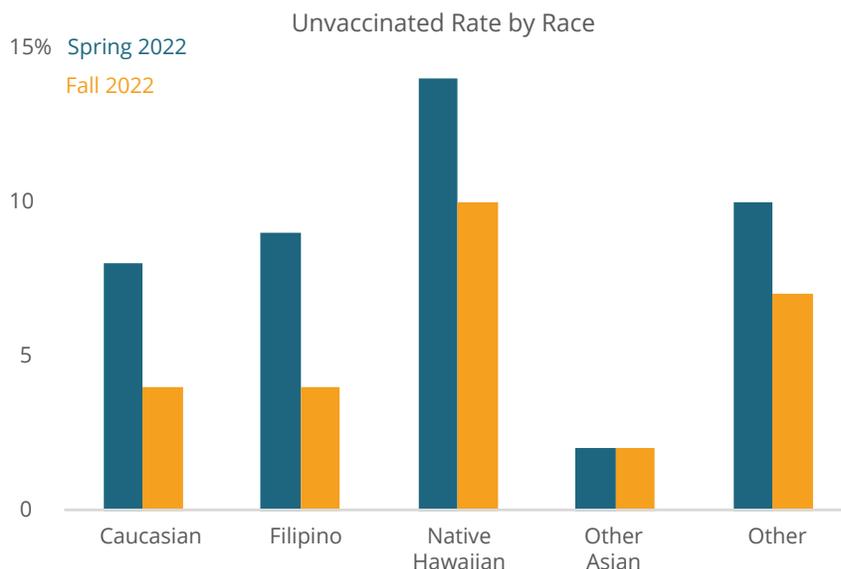


Who has yet to be vaccinated?

With one of the highest vaccination rates in the nation, Hawai'i has been doing well and this is reflected in our sample, with only about 4.2% of adult participants remaining unvaccinated. Despite this, significant pockets of unvaccinated populations remain, and this survey helps to understand the demographic characteristics of these individuals.

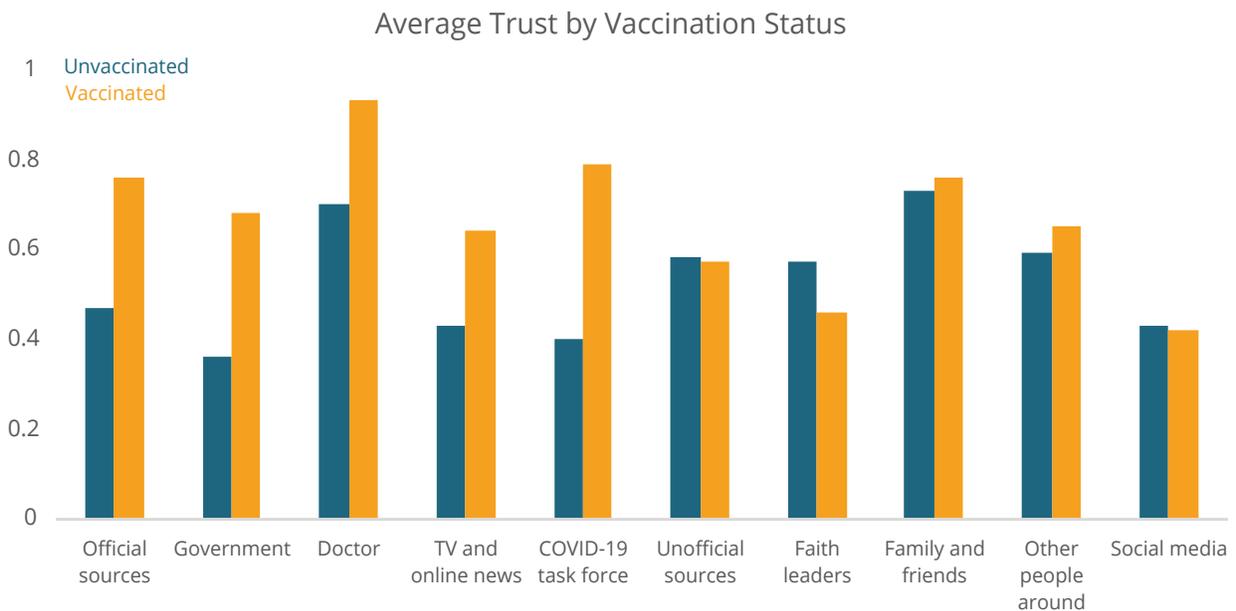
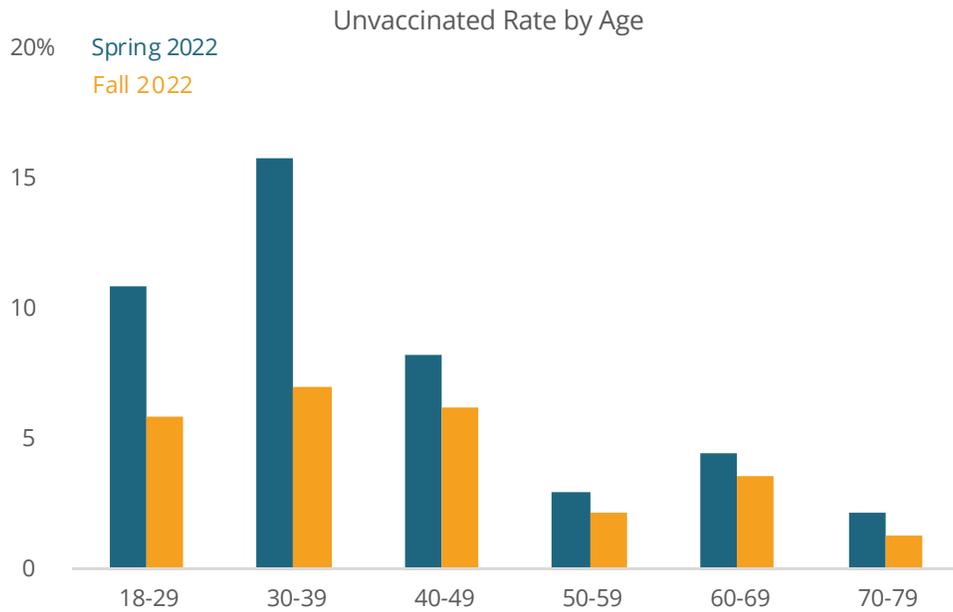
Unvaccinated individuals tend to be younger. Indeed, individuals older than 50 reported an unvaccinated rate of under 3% in November (down from 5% in May). In contrast, 6% of individuals aged 30-39 and 40-49 are unvaccinated (down from 15% and 8% in May respectively).

Despite significant efforts to reach people from all racial groups with vaccination campaigns, there are large disparities in vaccination rates across racial and ethnic groups. Under 10% of Native Hawaiians and less than 5% of Filipino and Caucasians remain unvaccinated (down from 14% and 10% in May, respectively). Among non-Filipino Asians, only 3% are not vaccinated, similar to May 2022.

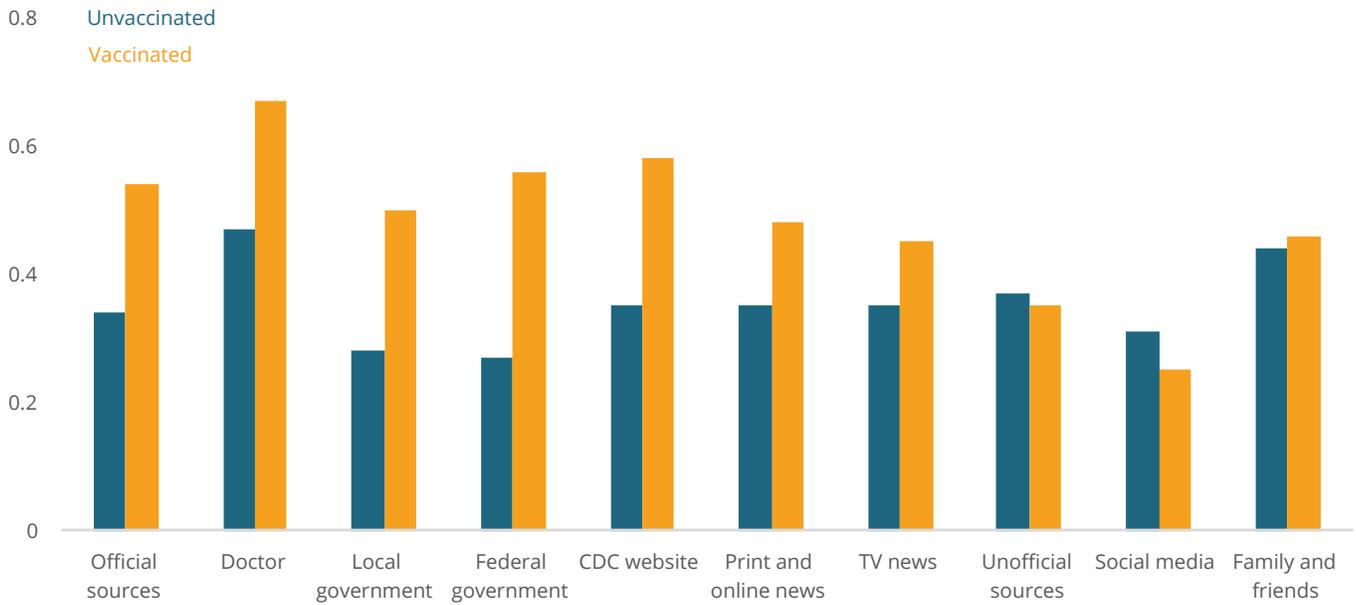


Education is an important factor related to vaccination status, with the unvaccinated tending to be less educated. Individuals with an advanced degree, bachelor’s degree and some college education report very low rates of being unvaccinated - 3%, 4% and 4%, respectively in November (similar to May). On the other hand, individuals with a high school diploma and no high school diploma report a 7%, and 20% likelihood of being unvaccinated, respectively (down from 14% and 41% in May).

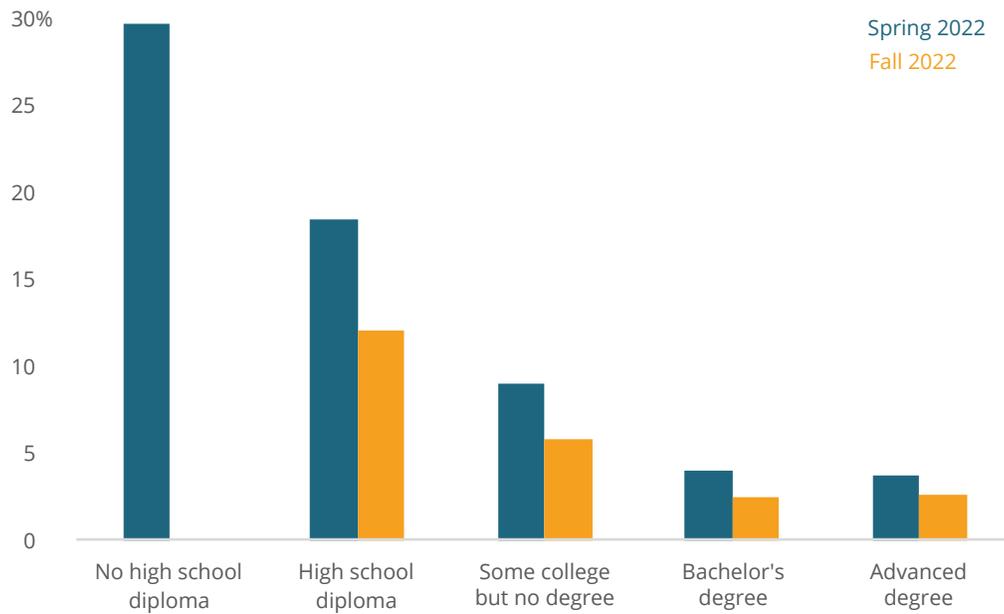
Finally, we surveyed how trust in different sources of information is related to vaccination uptake. For different sources of information, we asked individuals to rate their level of trust and indexed their responses on a scale of 0 to 1, with 0 corresponding to not trusting at all, and 1 corresponding to trusting all the time. Consistent with previous results by the team of investigators, we found that unvaccinated individuals are far less likely to trust medical providers and the federal government. They tend to consume more information from social media and their faith leaders (similar to May).



Average Consumption by Vaccination Status



Unvaccinated Rate by Education Level



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

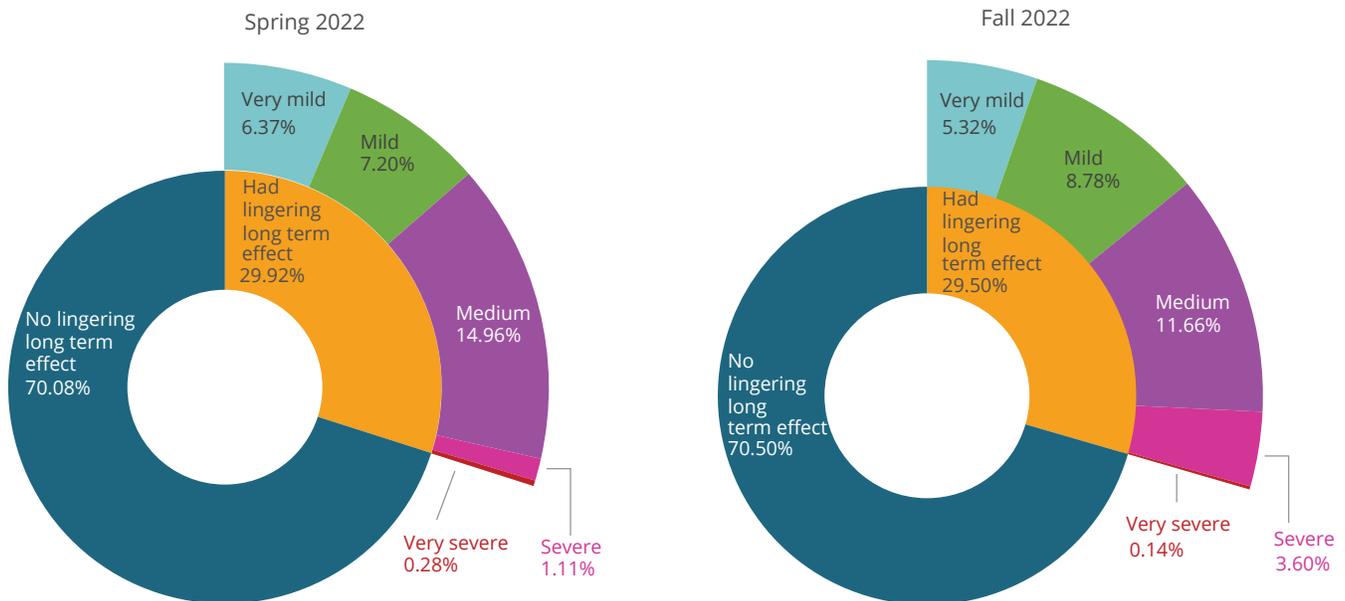
Long-COVID prevalence remains high. The overall rate of Long-COVID remained stable at close to **30%**, but more individuals reported severe or very severe symptoms in the Fall (**3.74%**) compared to the Spring (**1.39%**). Mental fog and headaches became the most common symptom in the Fall, with **58.8%** reporting them, while cough and shortness of breath had been most common in Spring. The expected length of symptoms increased by almost one month since the last report to **4.42 months**.

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. Of those who tested positive, around 30% reported lingering effects of the disease in Fall 2022, which is similar to the rate reported in 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 1.11% to 3.6% in the total population.

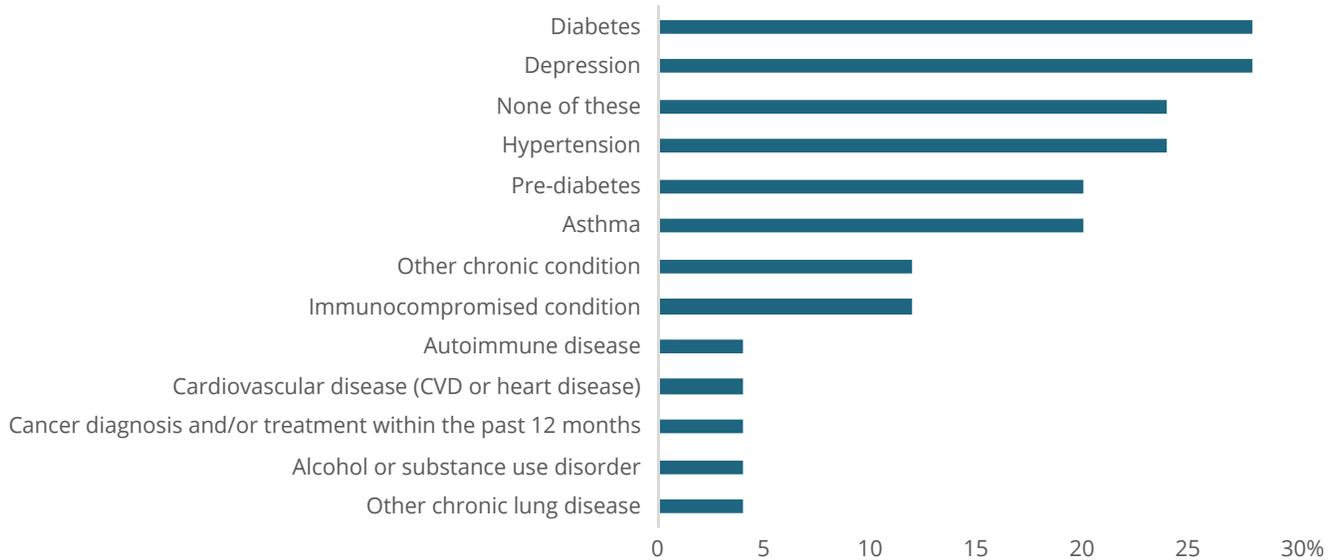
Have you had any lingering long term effects of COVID-19? How severe are the lingering effects of COVID-19?



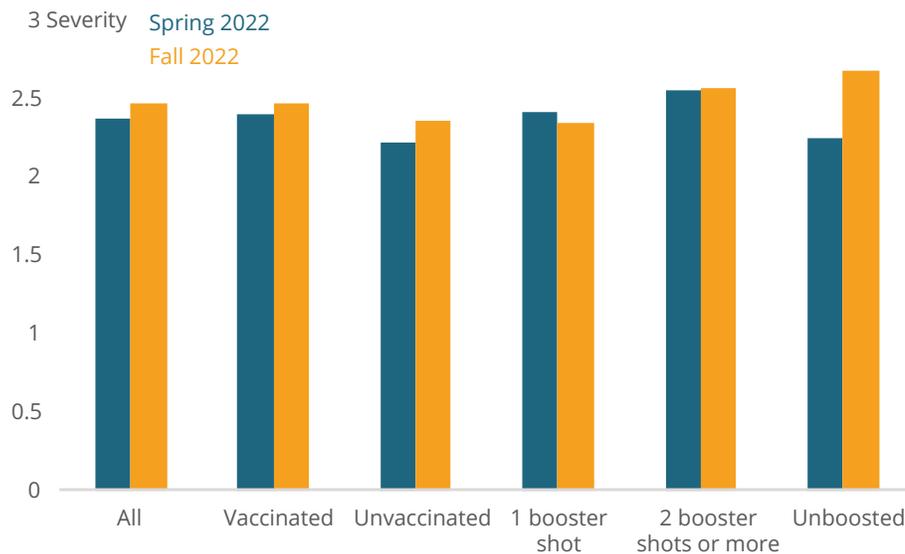
Long COVID and health conditions

We surveyed the chronic health conditions of people who experienced severe long COVID symptoms. We asked respondents whether they have any of the health conditions listed in the figure below. Only 24% of people suffering from severe long COVID have none of the listed chronic health conditions. 28% of respondents who have severe long COVID have diabetes, 20% have pre-diabetes, 28% have depression and 24% have hypertension.

Health Conditions Reported by Respondants with Long COVID

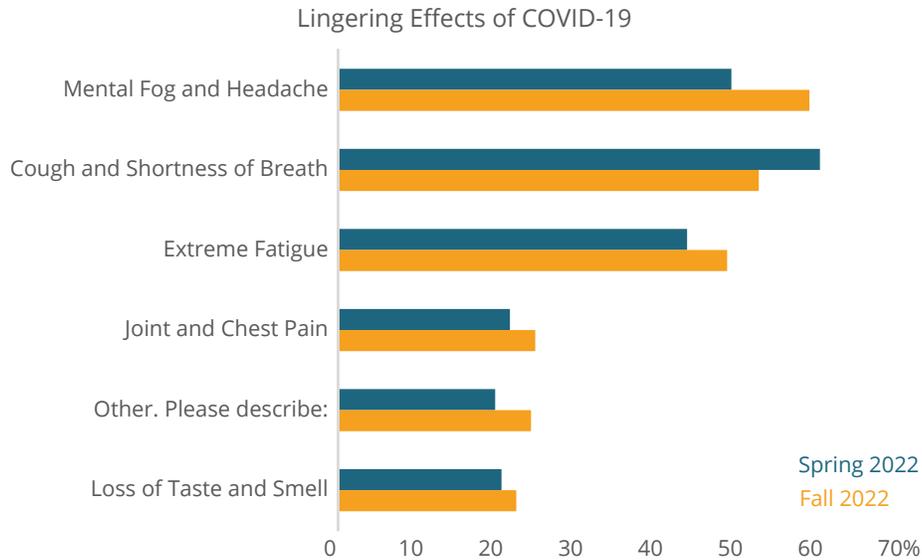


Expected Severity of Lingering Symptoms (1-5)



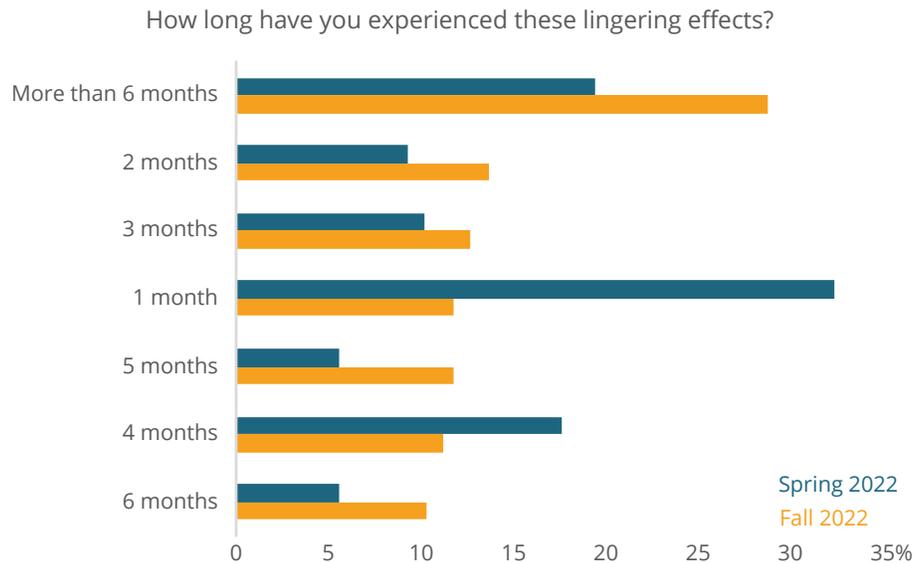
Lingering effects experienced

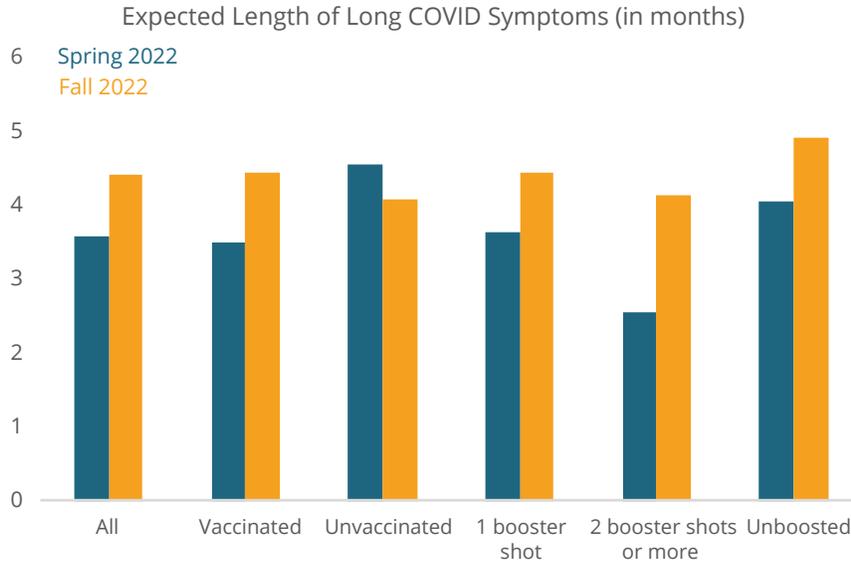
We report the most common symptoms of long COVID and the change in long COVID symptoms experienced below. Unlike in the Spring 2022 survey, mental fog and headache were the most common symptoms, reported by 58.8% of respondents. The next two most common symptoms were cough and shortness of breath (52.5%) and extreme fatigue (48.5%). With the exception of cough and shortness of breath, every long COVID symptom was reported at a higher rate in Fall 2022 than in Spring 2022.



Length and severity of lingering effects

The figure below illustrates the change in the expected length of COVID symptoms between Spring 2022 and Fall 2022. Compared to the survey in Spring 2022, individuals reported lingering effects of COVID-19 for a longer period of time. 28.8% of respondents experienced lingering effects for more than 6 months, followed by 2 months (13.7%) and 3 months (12.7%). The number of people, who experience long COVID-19 for a relatively short period of time (1 month) declined significantly in Fall 2022; 32.4% of respondents in Spring 2022 reported 1 month of long COVID-19 symptoms, compared to only 11.7% in Fall 2022.

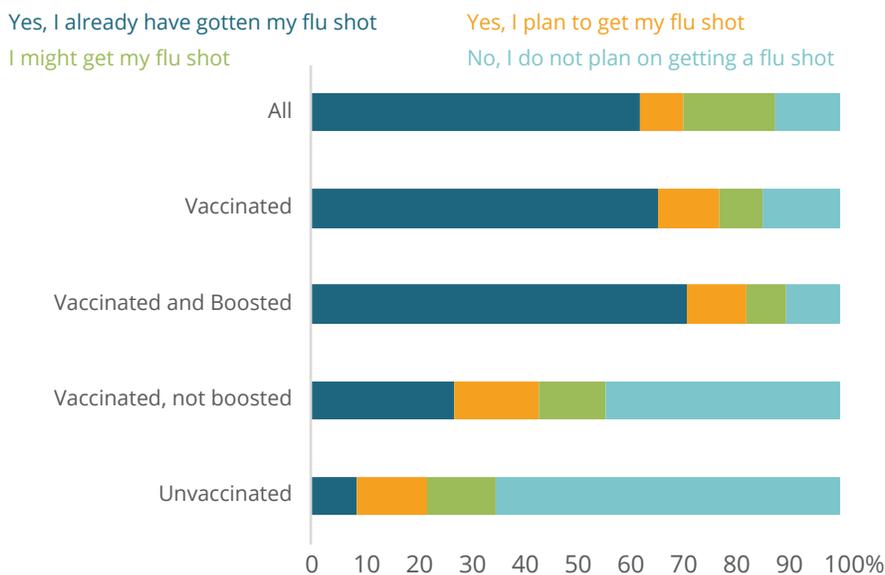




Flu shot uptake

*Flu shot uptake is correlated with COVID-19 vaccination: **62%** of respondents have already gotten their flu shots, with an additional **8.4%** planning to get one. **77.3%** of vaccinated individuals have or plan to get a flu shot, compared to **21.8%** of those unvaccinated. Among those vaccinated, **82.4%** of the people who received at least one booster shot have or plan to get a flu shot, compared to **43.1%** of those without any booster shots.*

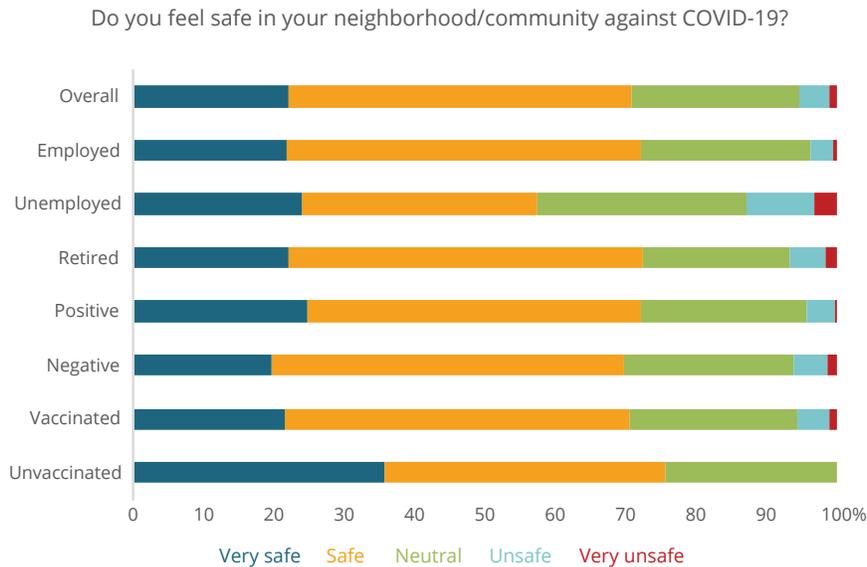
Most survey respondents reported having already received their flu shot (62%), with an additional 8.4% reporting that they plan to get one. 77.3% of vaccinated respondents already had or plan to get their flu shots, compared to only 21.8% of unvaccinated respondents. As Hawai'i has a very high vaccination rate most individuals in our sample were vaccinated. This may be related to the previous vaccine or test passport programs. However, booster shots were not incentivized in the same way, which may have led more people to skip it. Nonetheless, 82.4% of people who both are vaccinated and received at least one booster shot already have a flu shot or plan to get one, compared to only 43.1% of those who were vaccinated but did not get a booster shot.



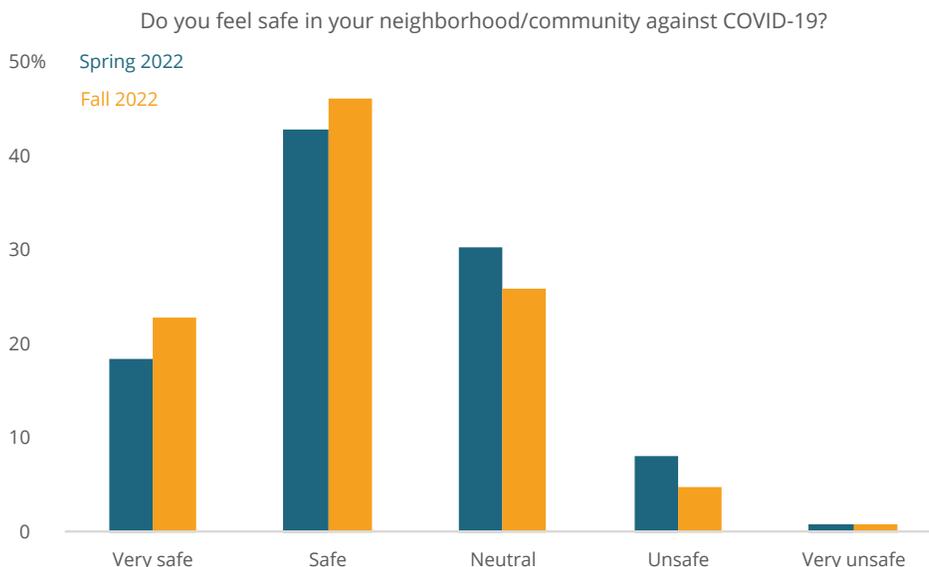
PERCEPTIONS AND VIEWS OF COVID-19

Safety perception

Perceptions of neighborhood/community safety against COVID-19 have increased. More people felt safe or very safe in the Fall (68.7%) compared to the Spring (61%). Unvaccinated people are more likely to feel safer than vaccinated respondents. Unemployed individuals felt less safe than employed and retired people.



The respondents were asked about how safe they felt in their community/neighborhood from COVID-19. In general, almost 71% of the respondents felt safe or very safe in their community. Less than 1% of the respondents felt very unsafe in their community. Interestingly, respondents who had not had COVID-19 in the past felt less safe in their neighborhood than respondents who did; the rates of feeling unsafe or very unsafe were 6% for the not previously COVID-positive people compared to only 4.2% for people who have had COVID. Similarly, no unvaccinated individuals reported that their community is unsafe or very unsafe while 5.4% of vaccinated people reported feeling unsafe or very unsafe in their community. Compared to employed and retired populations, unemployed people felt less safe in their community. Only 57.6% of the unemployed respondents felt very safe or safe while 72.6% of the employed individuals and 72.5% of the retired felt very safe and safe in their community.



We also tracked how people changed their perception of safety in the neighborhood/community against COVID-19 over time. Compared to Spring 2022, people felt safer in Fall 2022. The rates of feeling very safe and safe slightly increased while the rates of feeling unsafe fell significantly. 22.7% of the individuals felt very safe and 46% of the individuals felt safe in their community compared to only 18.3% and 42.7% in Spring 2022, respectively. The share of very unsafe feelings was unchanged since May 2022.

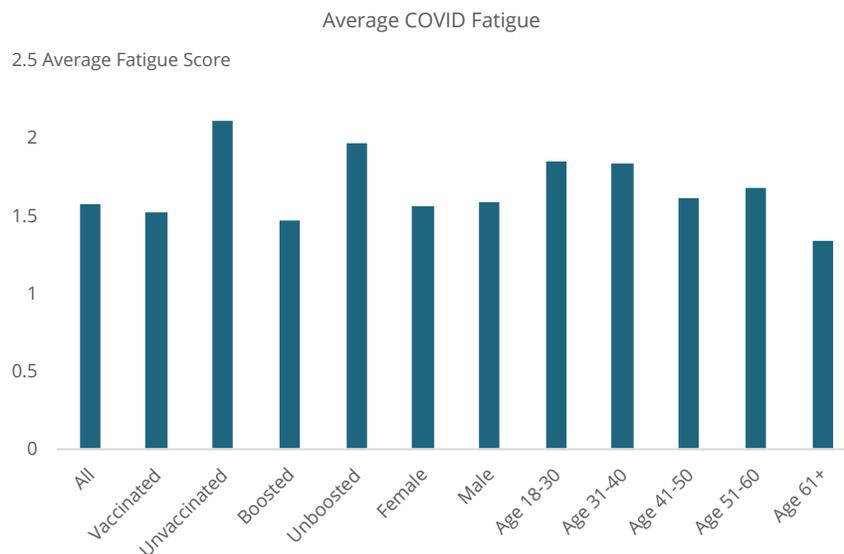
COVID-Fatigue

Signs of COVID fatigue are present in Hawaii’s populations. The highest levels were found among those unvaccinated (2.10 out of 4) and those vaccinated without booster shots (1.97 out of 4). The lowest scores were seen for those with booster shots (1.46 out of 4) and older adults (1.33 out of 4).

As we approach three years into the pandemic, many people are growing weary of hearing about COVID and handling changing rules and regulations, commonly referred to as COVID fatigue. To measure this, we asked how much people agreed or disagreed with the following statements:

- I am tired of all the COVID-19 discussions in TV shows, newspapers, radio programs, etc.
- I am sick of hearing about COVID-19
- When friends or family members talk about COVID-19, I try to change the subject because I do not want to talk about it anymore
- I feel stressed from following all the behavioral regulations and recommendations around COVID-19
- I am tired of restraining myself to save those who are most vulnerable to COVID-19
- I am losing my spirit to fight against COVID-19

Responses ranged from “Strongly disagree” to “Strongly agree”, with the following score assigned to each response: Strongly disagree = 0, Disagree = 1, Neutral = 2, Agree = 3, Strongly Agree = 4. For each question, the response scores are averaged for the whole group, then broken down by vaccination and booster shot status, gender, and age group. We then average the scores across questions to create an average COVID fatigue index. The overall average score was 1.57, which falls between “disagree” with COVID fatigue measures and “neutral”. The highest score was among the unvaccinated at 2.1, followed by those who were vaccinated but did not receive a booster shot at 1.97. The lowest COVID fatigue average scores were seen among those who received one or more booster shot (1.46) and those aged 61 years and older (1.33).



I am tired of all the COVID-19 discussions in TV shows, newspapers, radio programs, etc.

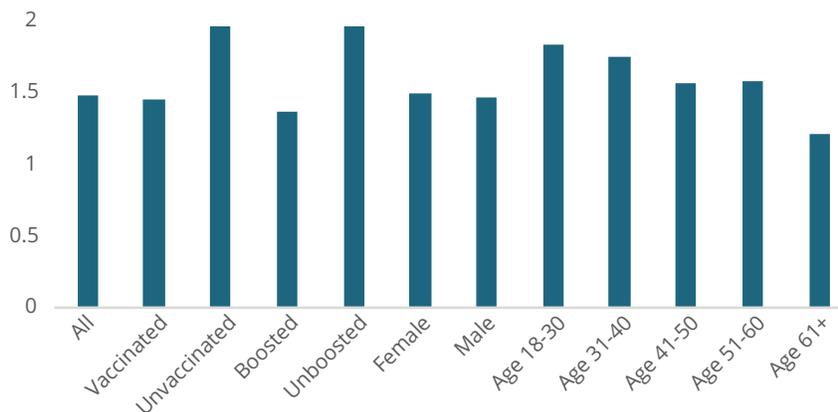


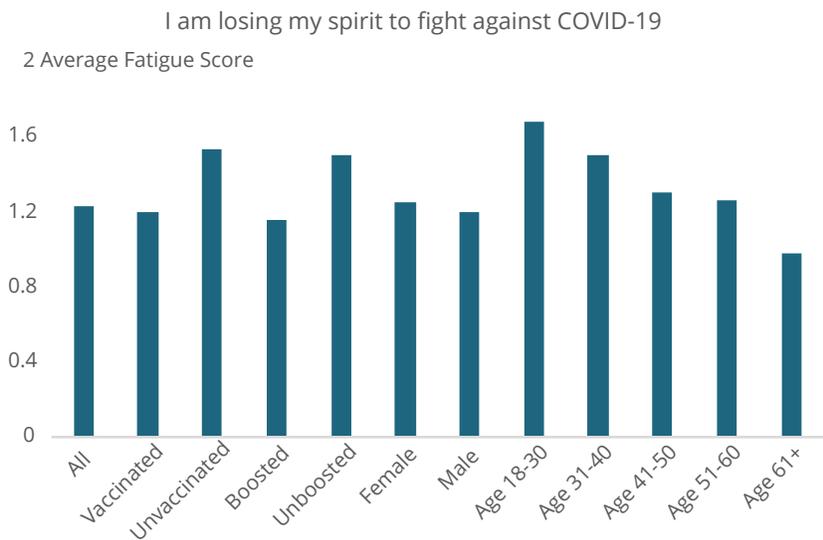
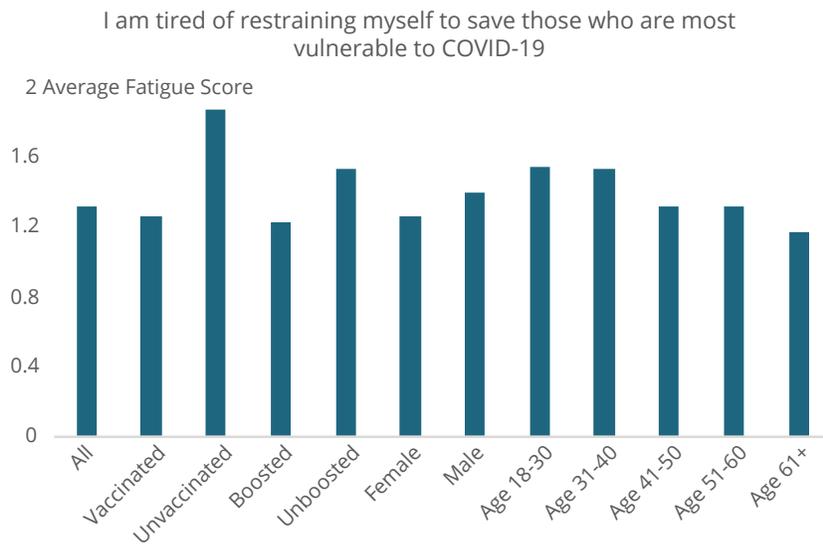
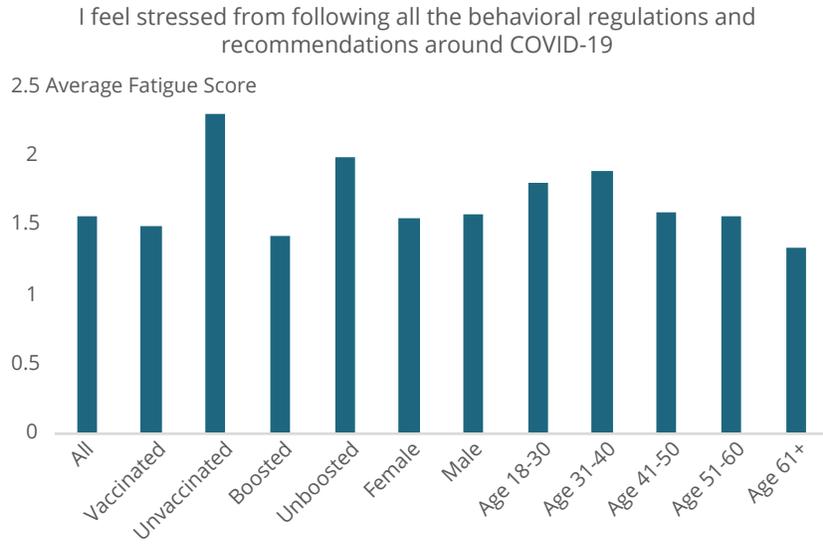
I am sick of hearing about COVID-19



When friends or family members talk about COVID-19, I try to change the subject because I do not want to talk about it anymore

2.5 Average Fatigue Score





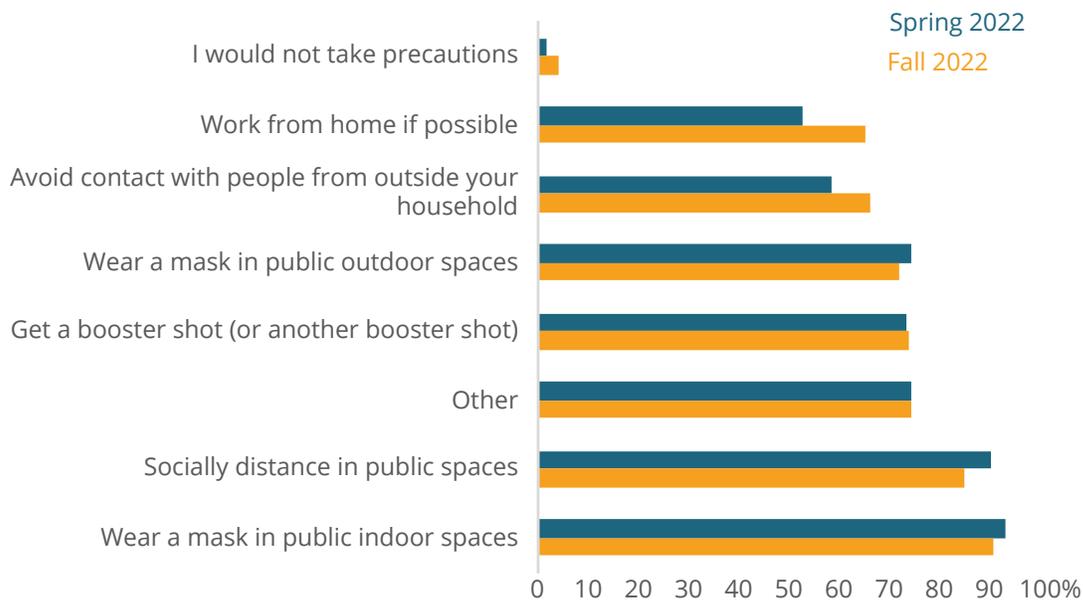
Perceptions of the future of the pandemic

Fewer people would be willing to take some precautions if there were to be a future wave of COVID-19: social distancing in public (5.5 percentage point decrease), wearing a mask in public indoor spaces (2 percentage point decrease). However, there was a 12.7 percentage point increase in those willing to work from home, and an 8.1 percentage point increase in those who would avoid contact with people outside their household. Nearly 10% more respondents believe the worst of the pandemic is already behind us. There was a 14.5 percentage point increase in those who believe COVID is over for their personal lives, and a 6.2 percentage point increase in those who believe the pandemic should be considered over.

Future precautions

In both May and November of 2022, respondents were asked what precautions they plan to take if there is another large wave of COVID-19. The ordering of the responses remained the same, with wearing a mask indoors being the most noted precaution at both times. The percent of respondents who said they would take each precaution stayed fairly stable. A few precautions saw slight decreases: socially distancing in public (5.5 percentage point decrease), wearing a mask in public indoor spaces (2 percentage point decrease), while others increased, including avoiding contact with people from outside your household (8.1 percentage point increase) and working from home if possible (12.7 percentage point increase). Lastly, an additional 2.3 percent of respondents said they would not take any precautions in November compared to May.

COVID-19 Precautions for Future Wave

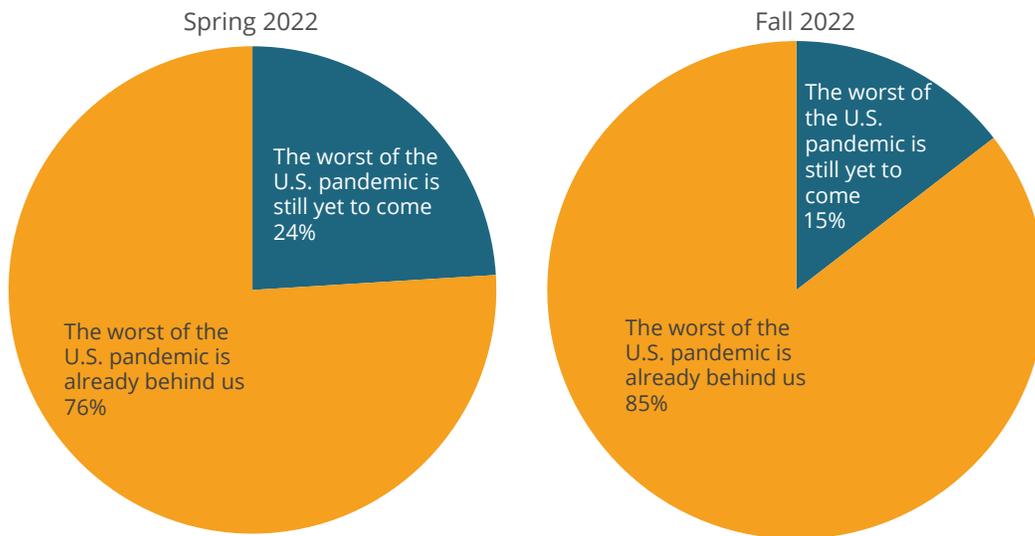


Personal views of current COVID-19 impacts

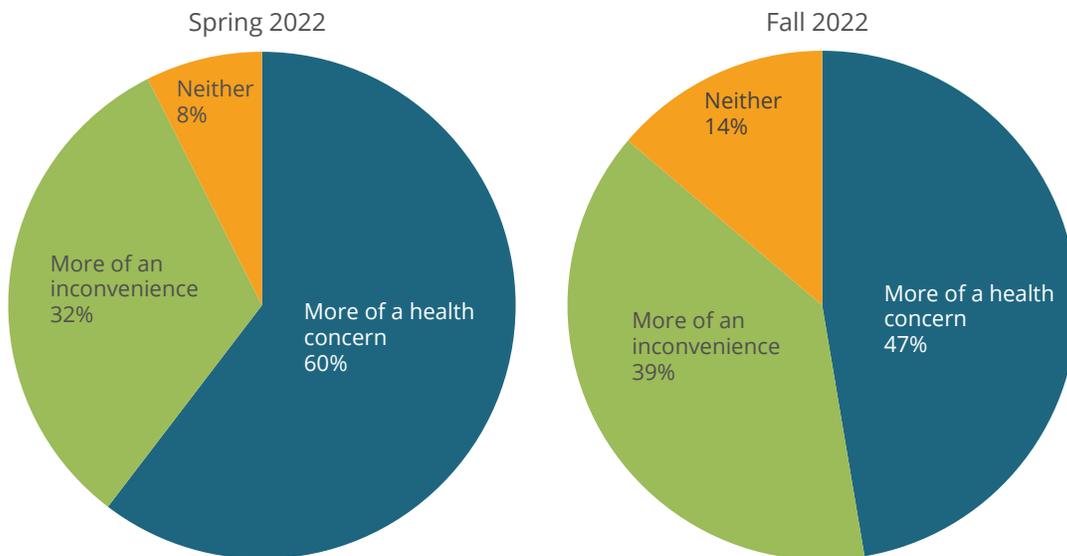
Respondents had more optimistic views on the pandemic in November compared to May. In May, 76% of people said the worst of the pandemic was over, which increased to 85.5% in November. Those who believed the worst is still to come decreased from 24% to 14.5% over this period as well.

We asked if respondents saw the pandemic as more of a health concern, an inconvenience, or neither. In May, 60.4% saw the pandemic as more of a health concern, compared with 47.3% in November. On the contrary, the proportion of people who see the pandemic as an inconvenience increased from 32.2% to 38.9%

Your View of COVID-19

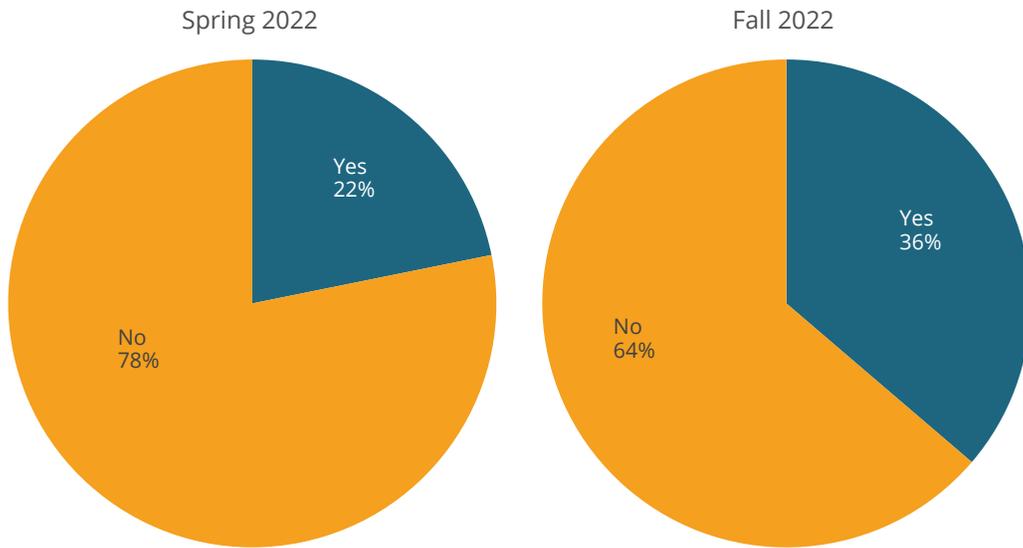


As it Affects me, COVID-19 is now...



We also asked people whether they consider the pandemic to be over in their own life, independently of what other people think. There was a 14.5 percentage point increase in November of those thinking that the pandemic is over in their own lives. Most people (63.7%) still think that the pandemic is still relevant in their lives; however this decreased substantially compared to May (78.2%).

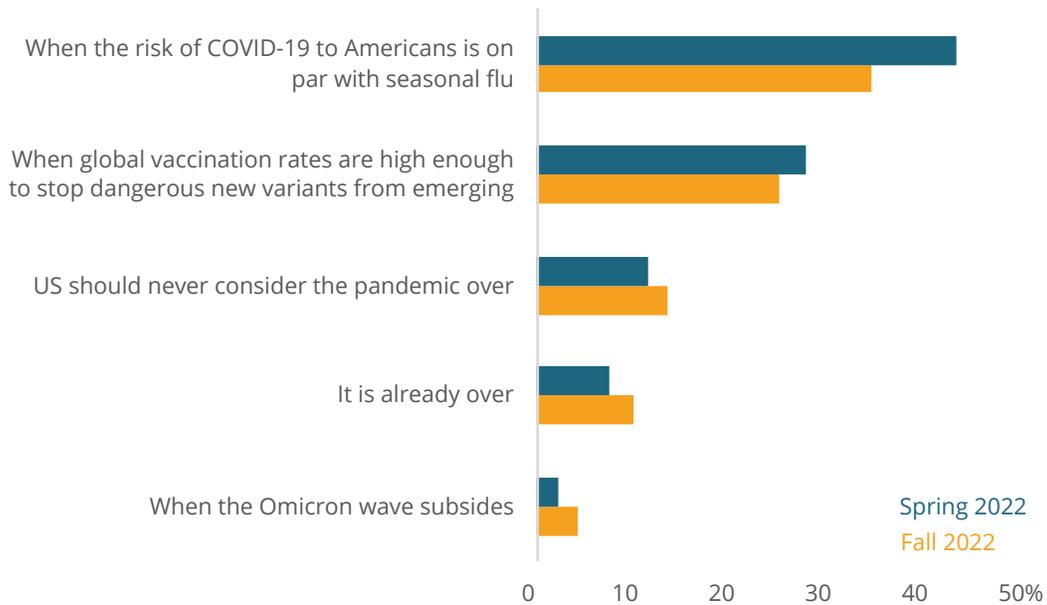
Is COVID over for personal life?



Perception of when the pandemic will be over

We find that most people think that the pandemic should be considered over in the U.S. when the risk of COVID-19 is on par with the seasonal flu (34.7% in November, compared to 43.4% in May). 25.1% of people believe that the pandemic should only be considered over when global vaccination rates are high enough to stop dangerous new variants from emerging (compared to 27.8% in May). In May, 7.4% reported they believed the pandemic was already over, compared to 10.0% in November.

When should the COVID-19 pandemic be considered over?

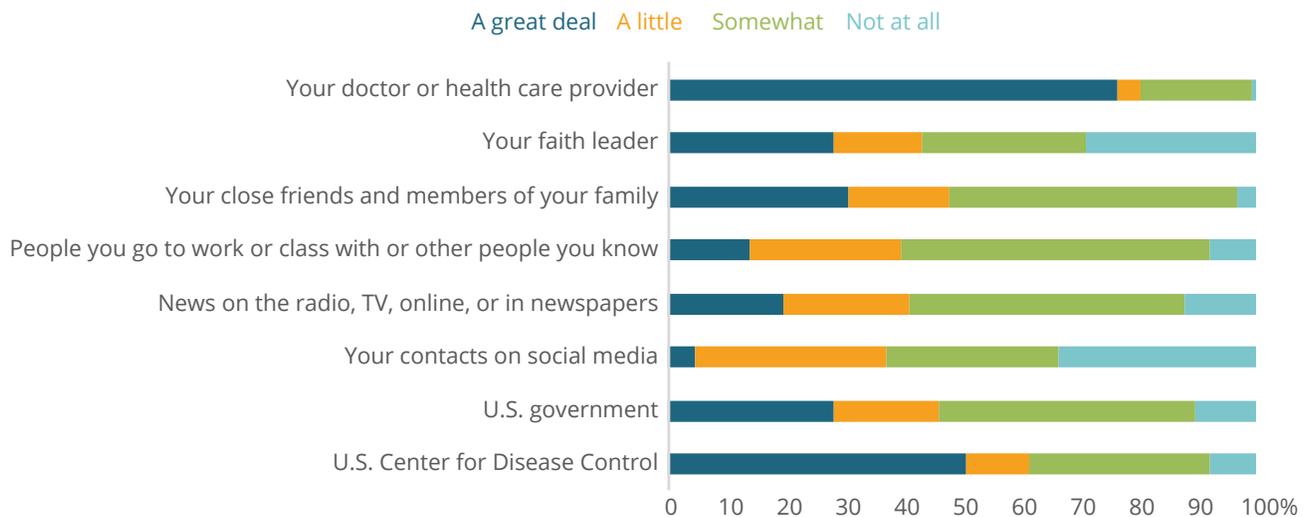


Trust, consumption of information, confidence

Trust in and consumption of information and confidence in information sources have been associated with vaccine and booster uptake in a variety of studies by the investigators on this team¹. In particular, trust in and consumption of information from official sources such as medical providers, the CDC, and the government, is associated with increased vaccine uptake. In contrast, trust in and consumption of information from unofficial sources, including social media contacts and faith leaders, is associated with decreased vaccine uptake. Overall, people were more likely to trust official information rather than unofficial information. In particular, 76.5% of the respondents to the Fall 2022 survey reported having a great deal of trust in their doctor or health care provider, while only 0.7% reported not having trust in their doctor or healthcare provider at all. In contrast, only 4.8% of respondents had a great deal of trust in their contacts on social media, while 33.6% did not trust this information source at all.

We also found that compared to individuals who got infected with COVID-19, respondents who have never tested positive for COVID were more likely to trust official information sources. 55% of people who have never had a positive COVID test reported having a great deal of trust in the U.S Center for Disease Control. More than 78% of these respondents have a great deal of trust in their doctor or health care provider.

How much do you trust each of these sources to provide correct information? (Fall 2022)



Information consumption by COVID-19 infection status

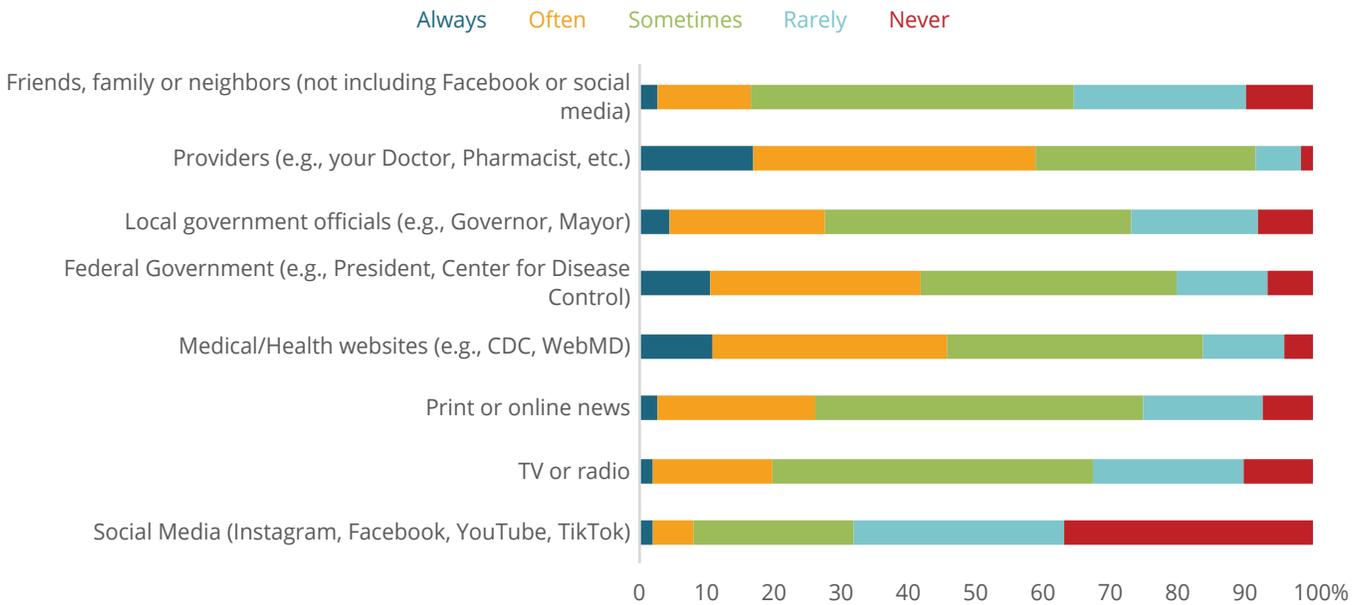
People were more likely to consume information from official sources. 16.9% of respondents always used information from healthcare providers (e.g., doctors, pharmacists), 10.6% always used information from Federal government officials, and 10.9% always relied on information from medical/health websites (e.g., CDC). Only 1.5% of individuals reported that they never used information from healthcare providers, whereas 36.7% never consumed information from social media (e.g., Instagram, Tiktok)

1 **Juarez R**, Kang ZK, Okihiro M, Garcia BK, Phankitnirundorn K, Maunakea AK. Dynamics of Trust and Consumption of COVID-19 Information Implicate a Mechanism for COVID-19 Vaccine and Booster Uptake. **Vaccines**. 2022; 10(9):1435.

Juarez R, Phankitnirundorn K, Okihiro M, Maunakea AK. [Opposing Role of Trust as a Modifier of COVID-19 Vaccine Uptake in an Indigenous Population](#). **Vaccines**. 2022 Jun 17;10(6). doi: 10.3390/vaccines10060968. PubMed PMID: 35746577

Juarez R, Phankitnirundorn K, Ramirez A, Peres R, Maunakea AK, Okihiro M. [Vaccine-Associated Shifts in SARS-CoV-2 Infectivity Among the Native Hawaiian and Other Pacific Islander Population in Hawaii](#). **Am J Public Health**. 2022 Sep 15;:e1-e4. doi: 10.2105/AJPH.2022.306973.

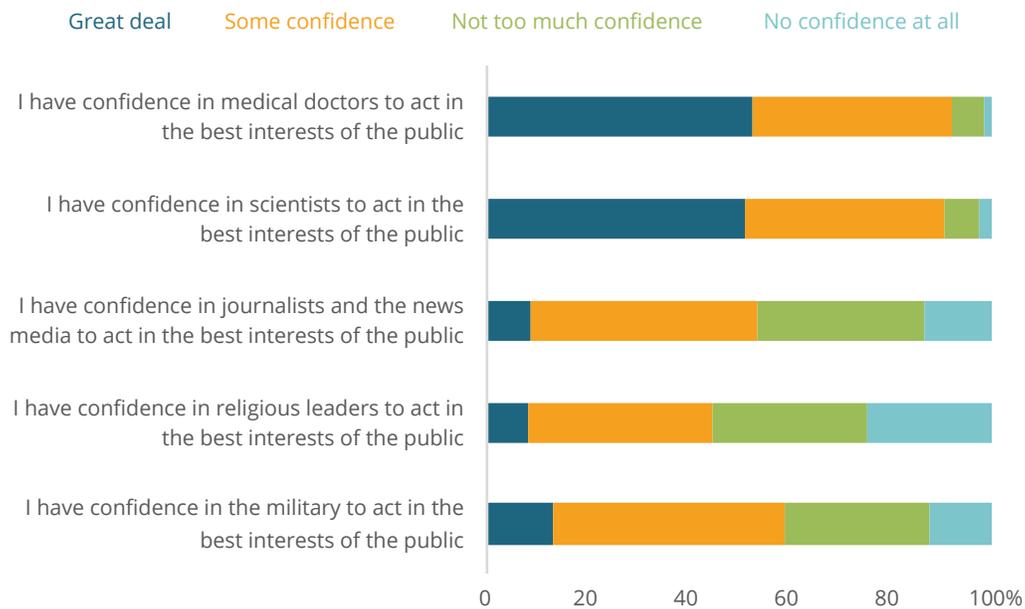
How often do you use or rely on the following sources to get information? (Fall 2022)



Confidence in information

Similar to the Spring 2022 survey, we asked individuals to rank their level of confidence in five information source categories: *medical doctors*, *scientists*, *journalists*, *religious leaders*, and the *military*. We found that the level of confidence greatly varies across sources in this follow-up survey. 52.8% of respondents had a great deal of confidence in medical doctors, and 51.1% had a great deal of confidence in scientists, whereas only 8.3% of individuals had a great deal of confidence in journalists and news media. and 8.2% had a great deal of confidence in religious leaders.

Your confidence about: (Overall, Fall 2022)



COVID-19 IMPACTS

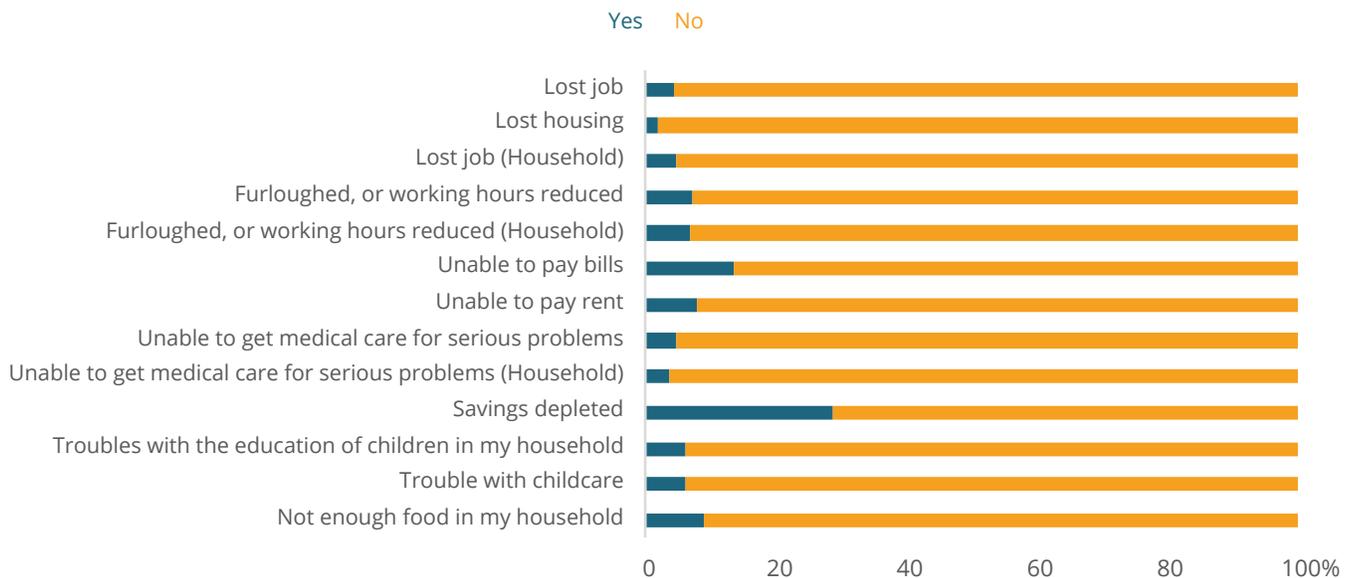
COVID-19 impact since May 2022

The impact of the COVID-19 pandemic continues to increase since May 2022: **28.6%** of the individuals reported having their savings depleted, **13.6%** were unable to pay bills, and **9%** did not have enough food in their household. **4.4%** of the individuals lost their jobs, and **7.2%** of the individuals were furloughed or reduced their working hours since May 2022.

The individuals were asked about the impact of COVID-19 on their household since May 2022, considering a range of impacts: job loss, housing loss, working hours reduction, ability to pay bills, ability to pay rent, saving depletion, trouble with children’s education, trouble with childcare, and food shortage.

28.6% of individuals reported having their savings depleted, followed by being unable to pay bills (13.6%) and not having enough food in their household (9%). Respondents also reported having employment issues. 7.2% of the individuals were furloughed, or reduced their working hours while 6.6% of them reported having someone in their family furloughed or reducing working hours. 4.4% of people reported losing their job because of COVID-19 since May 2022.

COVID-19 impact on households since May 2022

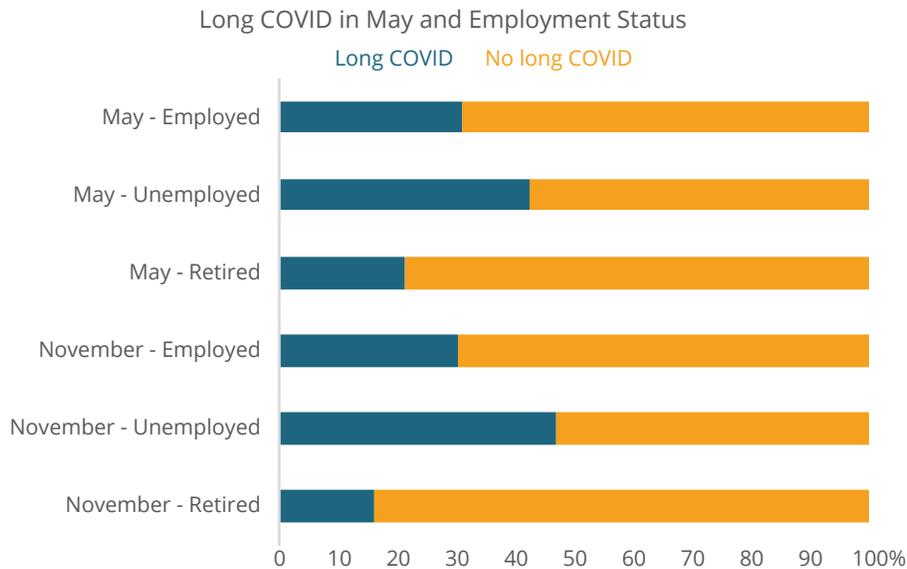


Long-COVID and Employment

Despite the rate of long-COVID being about 30%, unemployed individuals have a **47%** rate of long-COVID, a 5-point increase since May.

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 November 2022 an even higher proportion of individuals reported having both long-COVID symptoms and experiencing unemployment compared to May 2022 had reduced their workforce participation.

Unemployed individuals in November reported a 47% rate of long-COVID, an increase from 42% in May 2022. In contrast, the rate of long-COVID for employed individuals remained at about 30% for November and May 2022.

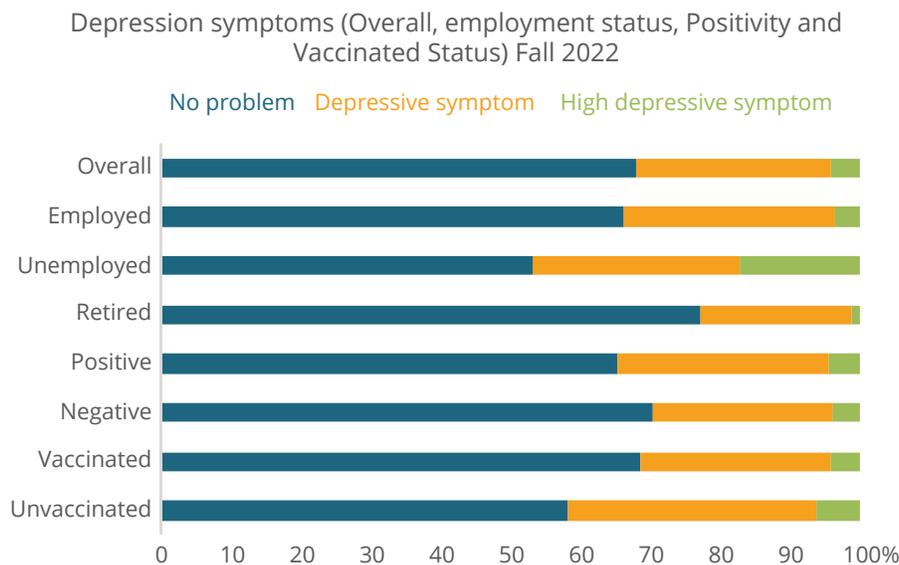


Depression and self-esteem

*Depression symptoms remain high but stable: Rates of depression symptoms remained stable since May, at about **1 in 3 adults** reporting depression symptoms. This rate was higher for unvaccinated individuals at **42.8%**, compared to **31.2%** among those vaccinated. **46.8%** of unemployed people reported having depression symptoms, compared to **33.7%** of employed people and **22.7%** for retirees.*

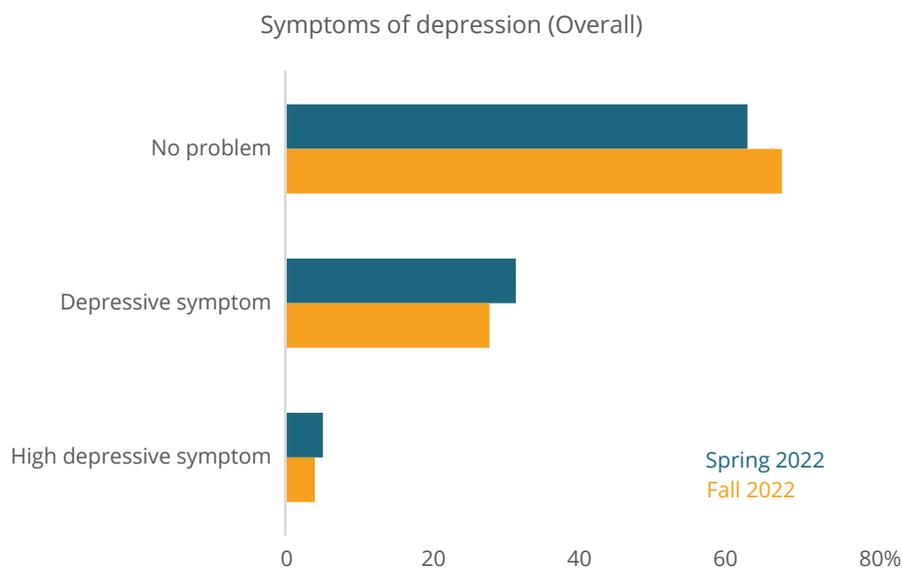
Symptoms of Depression

Similar to the survey in Spring 2022, we monitored depression using the 10-item Center for Epidemiological Studies-Depression (CES-D) scale. Respondents were asked to rate how often over the past week they experienced symptoms associated with depression, including restless sleep, poor appetite, and feeling lonely. The CES-D has a maximum total score of 30. A total score below 10 corresponds to normal; scores between 10 and 20 suggest that the individual is experiencing symptoms of depression, and scores above 20 correspond to highly depressive symptoms.



Similar to Spring 2022, about one out of three residents in Fall 2022 reported some symptoms of depression. We also see that the unvaccinated are more likely to experience some symptoms of depression (42.8%) than the vaccinated (31.2%). In contrast to the survey results from Spring 2022, however, we see differences between people who did and did not test positive for COVID in the Fall. People who tested positive are more likely to experience some symptoms of depression (34.7%) than those who tested non-positive (29.5%). Unemployed people are more likely to have symptoms of depression than employed and retired people. 46.8% of unemployed people reported some symptoms of depression while the rates are 33.7% for employed people and only 22.7% for retirees.

We also report the change in the rate of reported depression symptoms between Spring 2022 and Fall 2022 below. Compared to Spring 2022, the number of people who have depressive symptoms was slightly lower in the Fall. 27.8% of individuals reported having depressive symptoms and 4.1% reported having highly depressive symptoms; the rates of depressive symptoms and high depressive symptoms were 31.6%, and 5.2% respectively in the Spring. 68.1% of individuals reported having no symptoms of depression in Fall 2022.



Self-esteem

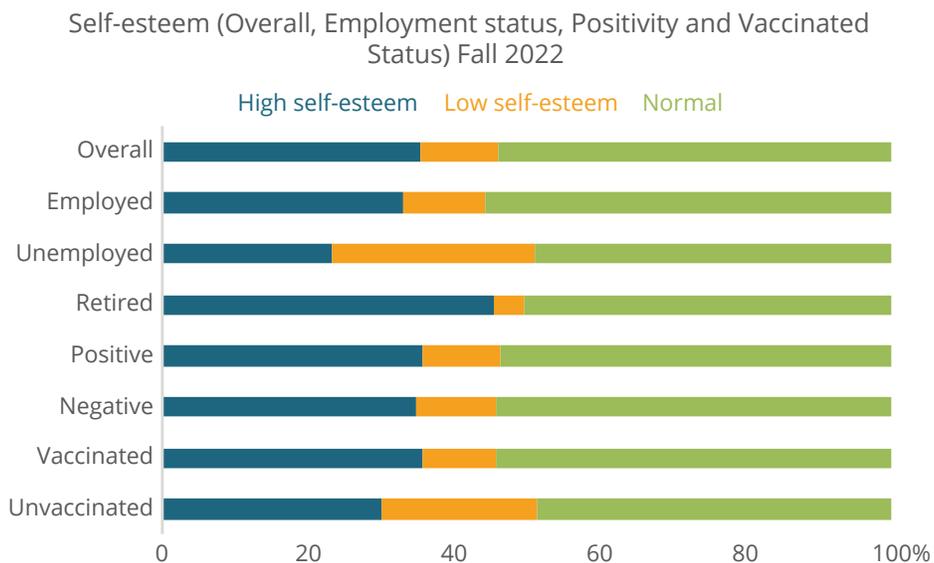
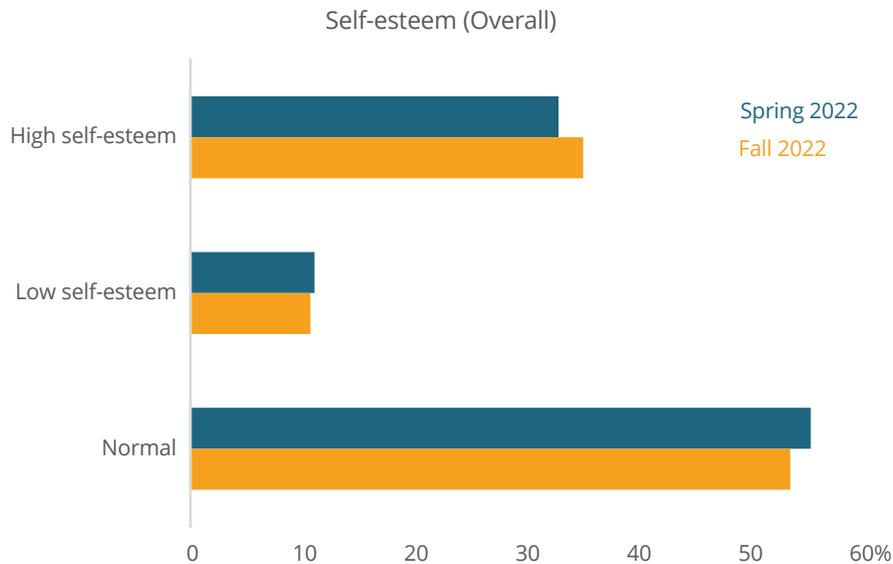
About 1 in 10 adults report low self-esteem, a similar rate as in the previous report in May.

We measured self-esteem using the Rosenberg Self-Esteem Scale, which is a 10-item scale used to evaluate both positive and negative feelings about oneself. We report basic descriptive statistics and comparisons with the Spring 2022 results in the figures below.

The Fall 2022 results mimic the Spring 2022 results in many ways. We see that about 11% of respondents have low self-esteem. However, we found that the number of high self-esteem people slightly increased; 35.3% of people reported having high-self esteem in Fall 2022, compared to 33.1% in Spring 2022. 53.9% of people reported having normal self-esteem in Fall 2022.

We also found no changes in self-esteem status between those who tested positive for COVID-19 and those who did not. We also see that the unvaccinated have significantly lower self-esteem (21.4%) than the vaccinated (10.2%).

With regard to employment status, both of the survey rounds show that unemployed people have lower self-esteem than employed people and retirees. 28% of employed people reported low self-esteem while the rates of low self-esteem are 11.6% for employed people and only 4.1% for retired individuals.



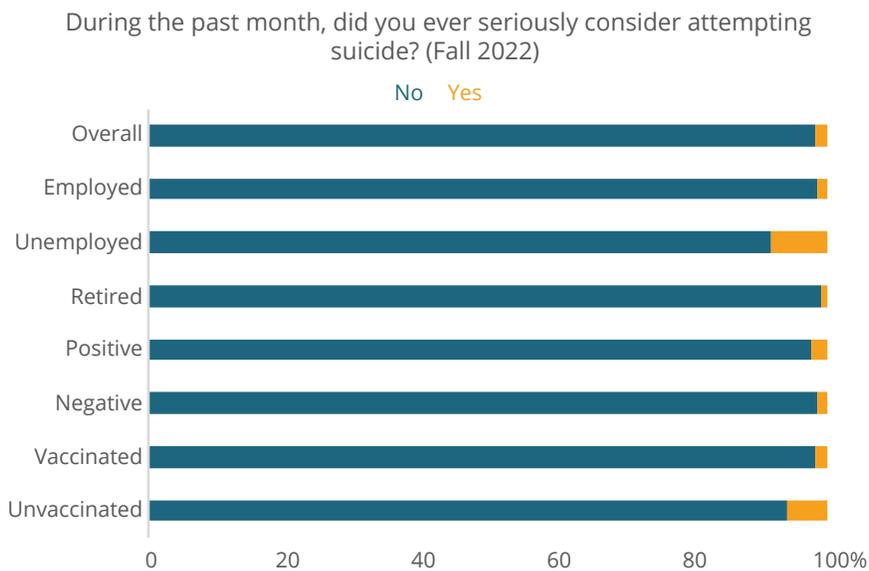
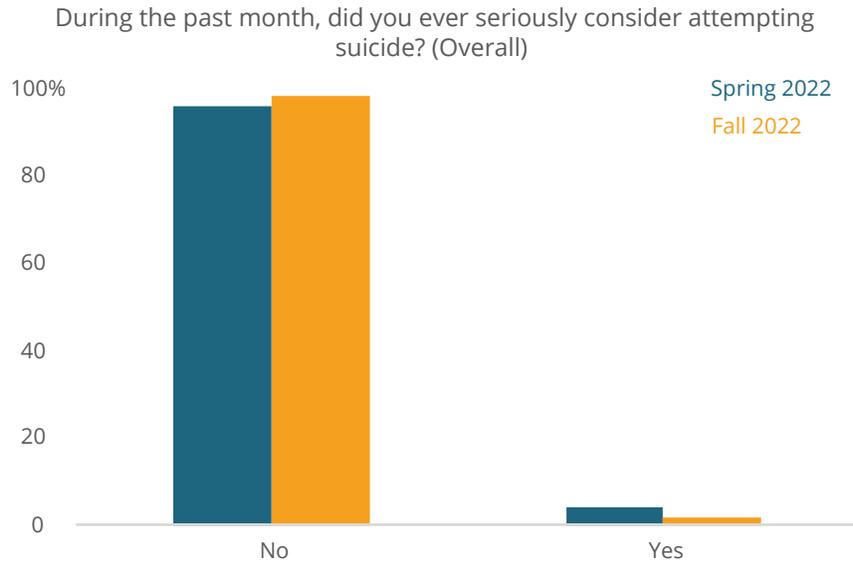
Suicidal ideation

Suicidal ideation decreased: There was a 2.5 percentage point reduction in the number of respondents reporting having suicidal ideation in the past month in Fall compared to Spring. Unvaccinated individuals had a higher rate at 5.7%, compared to the vaccinated rate of 1.5% in the Fall survey, while in the Spring there was little difference between these groups.

We surveyed respondents about whether they experienced suicidal ideation during the past month. Overall, 1.7% of survey respondents contemplated suicide during the past month, which is significantly lower than the 4.2% of respondents in Spring 2022.

We do not see any differences in the rate of suicidal ideation between those who tested positive for COVID-19 and those who did not test positive. However, more unvaccinated people (5.7%) reporting suicidal ideation than vaccinated people (1.5%). This is slightly different from the result in Spring 2022 where the rates of suicidal ideation are almost the same for vaccinated and unvaccinated people.

When broken down by employment status, 8.1% of unemployed people reported having suicidal ideation, which is significantly higher than employed and retired people; the rate of suicidal ideation is 1.4% for employed respondents and only 0.7% for retired respondents.



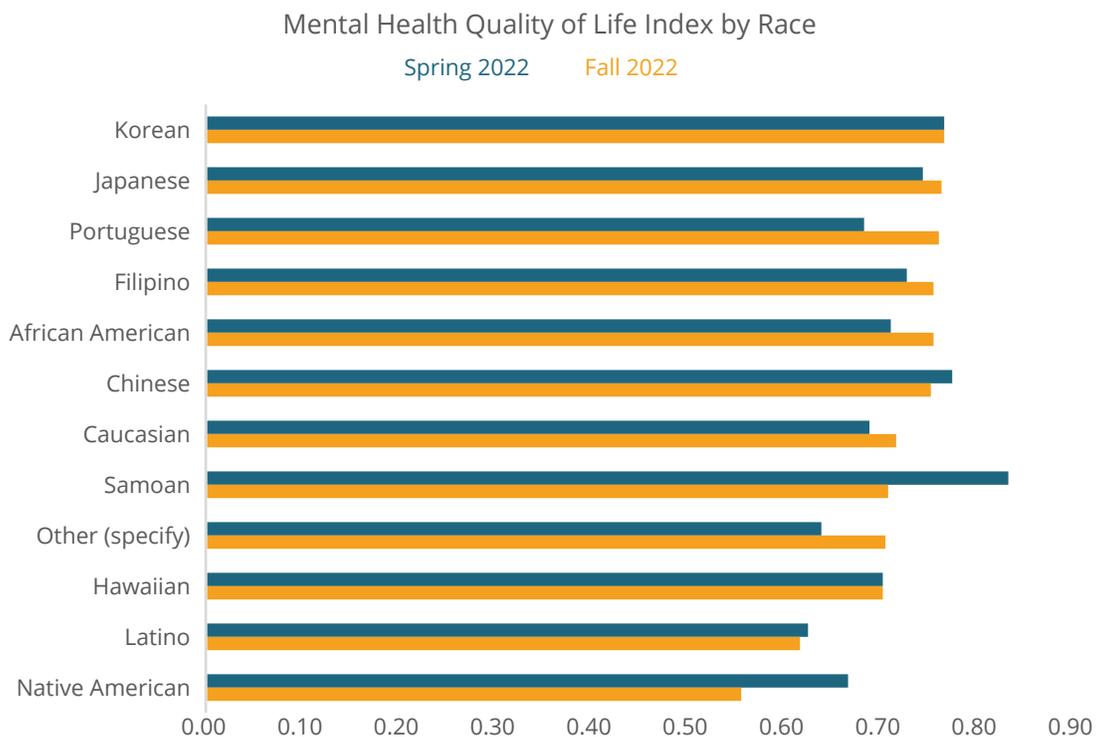
Mental health quality of life index by race

Race disparities were observed in mental health outcomes: Korean and Japanese respondents had the highest scores in mental health outcomes, while Native Hawaiian, Latino, and Native American respondents had the lowest mental health outcomes.

We created a mental health quality of life index (MHQoL) to assess the quality of life for respondents with mental health problems. Our MHQoL was designed based on two previously developed indices, MHQoL-7D and EQ-5D-5L. MHQoL-7D, developed by Krugten, et al. (2021), includes items that cover seven dimensions: self-image, independence, mood, relationships, daily activities, physical health and future. The EQ-5D-5L index was introduced by the EuroQoL Group

in 2009 and comprises five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Our MHQoL is calculated as the average score of three dimensions measured in the survey: depression symptoms, suicidal ideation, and self-esteem. Each dimension receives a score of 1 if the respondent reports no symptoms or no problem, and a score of zero if the respondents have any symptoms of mental health or low self-image. The MHQoL score can vary from zero (“worst psychological well-being”) to 1 (“best mental health state”). Higher scores indicate a better quality of life.

Descriptive statistics of MHQoL by race are displayed in the figure below. On average, MHQoL scores are higher in Fall 2022 than in Spring 2022, reflecting improvements in mental health outcomes since Spring 2022. However, mental health scores and changes in scores varied by race. Koreans and Japanese have the highest MHQoL scores (0.77 and 0.76 respectively) on average, while Hawaiian, Latino and Native American have the lowest MHQoL scores. Samoan people saw the largest increase in MHQoL score in Fall 2022.



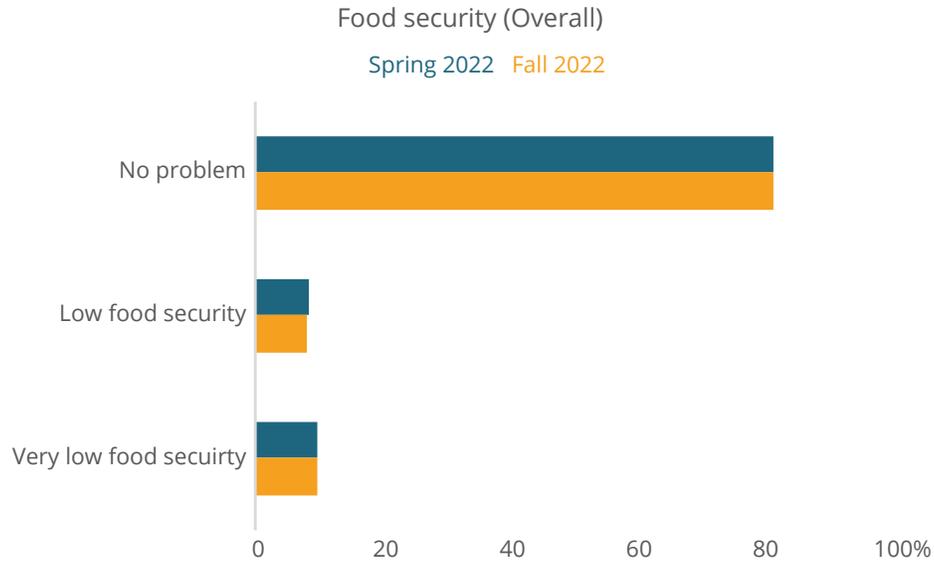
Food security

*Food insecurity remained high but stable. The percentage of respondents reporting low food security declined slightly to **8.2%** from 8.4% in May. Unemployed respondents were more likely to have low or very low food security compared to employed or retired respondents. Unvaccinated respondents were more likely to be food insecure than vaccinated respondents.*

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.

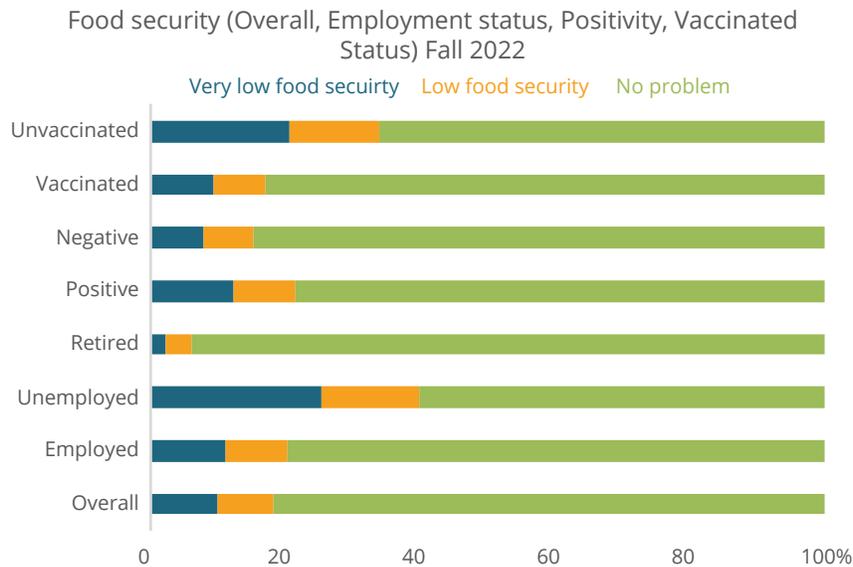
Descriptive statistics for food insecurity are reported below.

Similar to the survey in Spring 2022, we found that more than 80% of respondents had no issues with food security. In contrast, the number of people experiencing low food security declined slightly to 8.2%; 9.9% of adult respondents 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. We see a similar pattern by vaccination status; the unvaccinated were more likely to be food insecure. Compared to the survey in Spring 2022, more unvaccinated people suffered from very low food security; the rates of very low food security rose from 16.7% in Spring 2022 to 20.6% in Fall 2022.

Compared to employed people and retirees, unemployed people were more likely to have low food security and very low food security. 14.8% of unemployed respondents had low food security and 25.2% had very low food security.

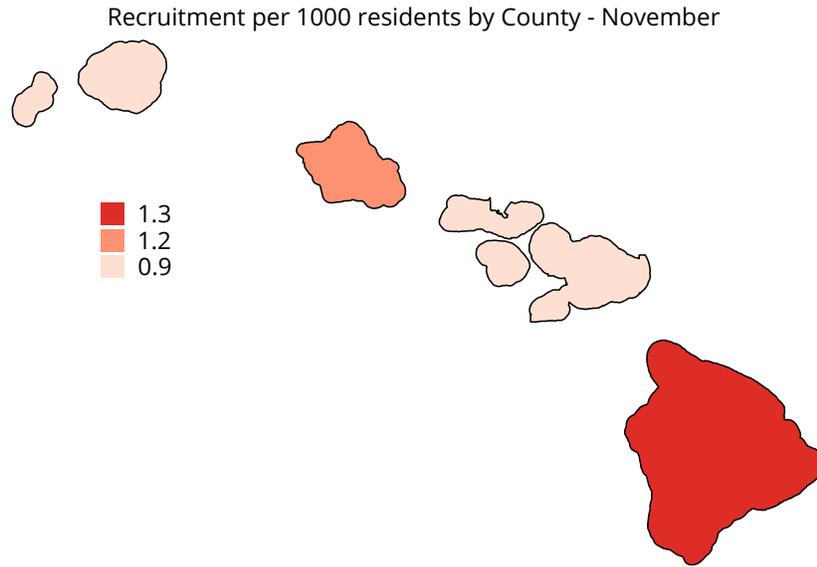


DESCRIPTION OF SURVEY RESPONDENTS AND METHODOLOGY

Adult individuals who were part of the original cohort recruited in May 2022 were asked to complete a follow-up questionnaire in Fall 2022. Of the over 2000 adults invited to participate, 1,627 completed the follow-up survey. The retention rate was very high at over 80%. We provide unweighted descriptive information on this sample below.

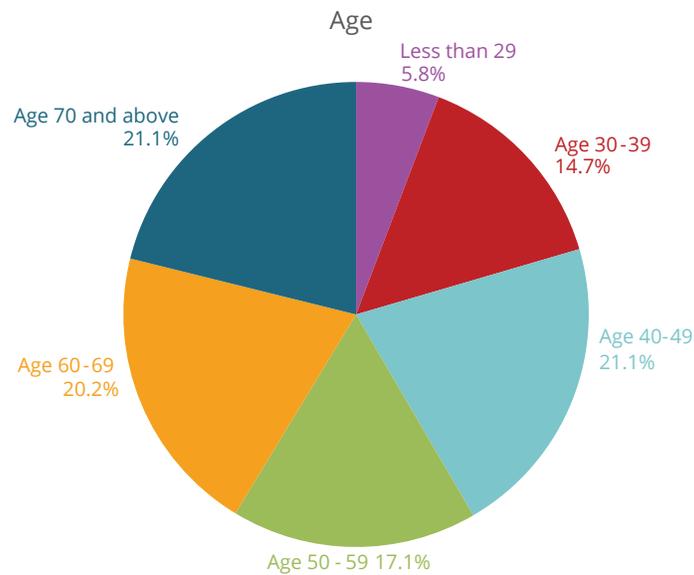
Geographical distribution

The map below depicts the geographical reach of the survey. The map depicts the number of people that we were able to survey per 1,000 adults. As can be seen, we were able to survey people from throughout the State of Hawai'i. We obtained the highest coverage for Hawai'i county (1.3 per 1,000 adults) and the lowest for Kaua'i and Maui counties (0.9 per 1,000 adults).



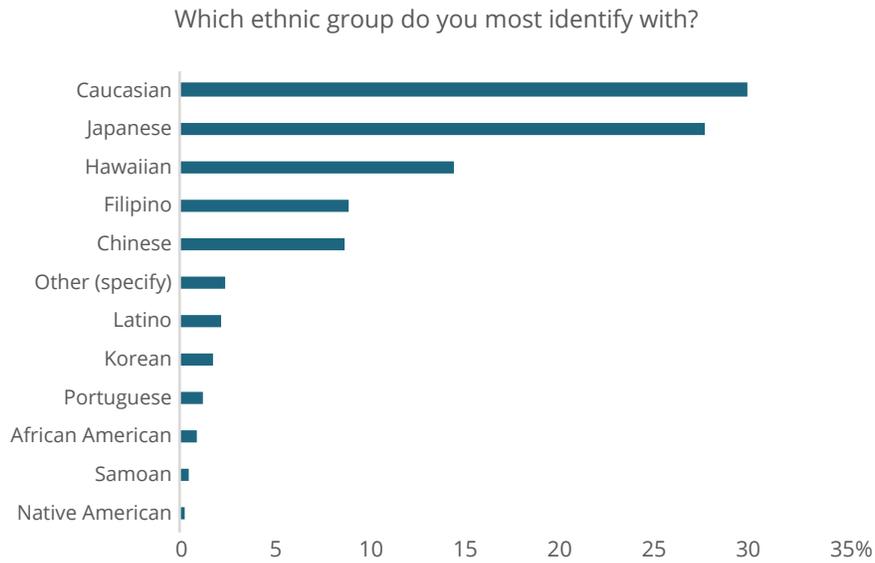
Age distribution

We depict the age distribution of the sample below. Notably, older populations, who are often difficult to recruit, are well represented, with over 41% of adults in our sample being 60 years or older.



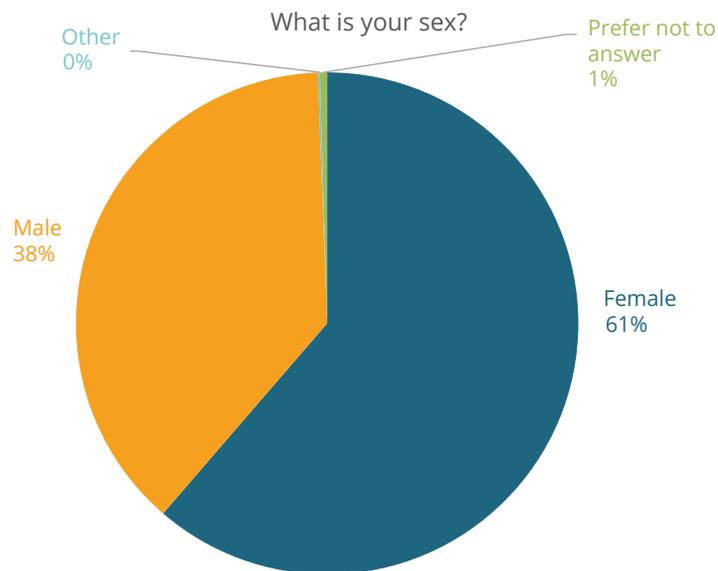
Race/Ethnicity distribution

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 30% of our sample is self-defined as Caucasian, followed by Japanese (27.9%) and Native Hawaiian (14.6%).



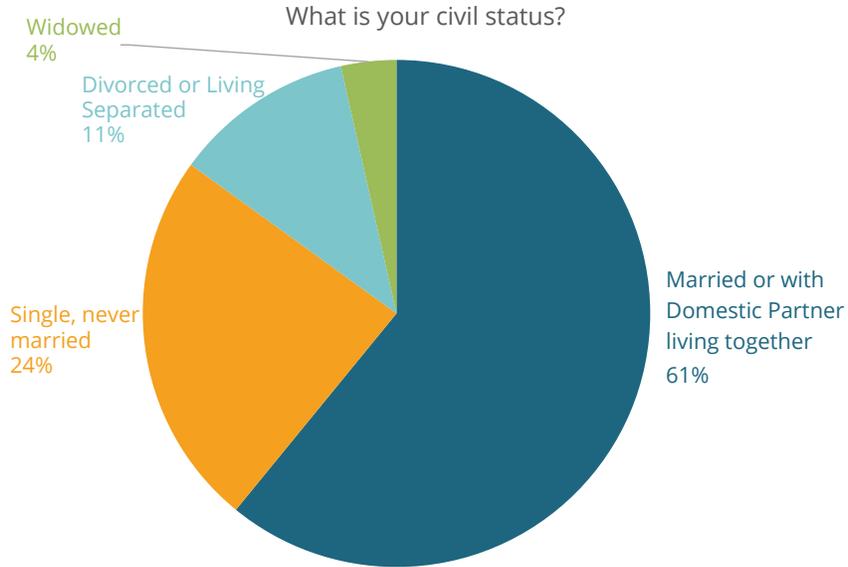
Gender distribution

Descriptive statistics on the gender of the sample respondents shows 61.3% of people identified as female and 38.1% as male. 0.6% of the sample selected other gender or preferred not to answer. The distribution is similar to the responses in May.



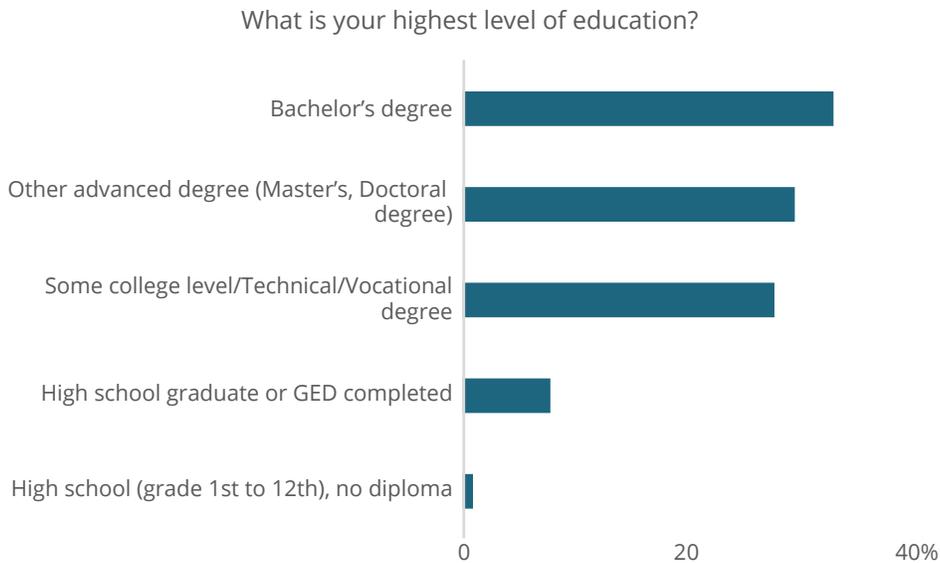
Civil status distribution

The participants are asked about their civil status. 60.9% of the respondents are married or living with a domestic partner. This is followed by people who are single, have never been married, and divorced or living separated, with 24.1% and 11.5% respectively. Only 3.5% of the individuals are widowed.



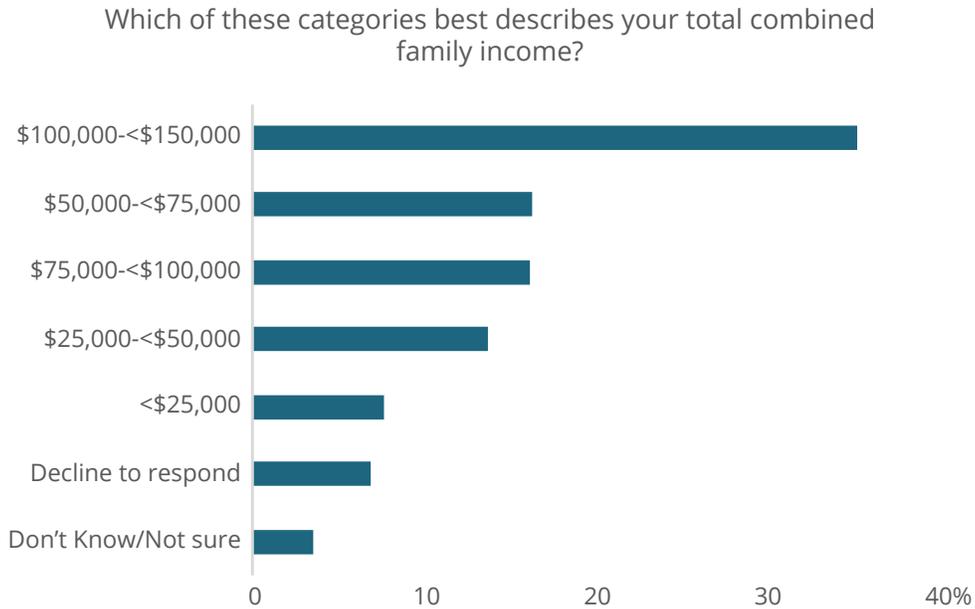
Education distribution

The figure below depicts the education profile of the survey respondents. 33.4% respondents had a bachelor's degree without a graduate degree. 29.9% completed an advanced degree (Master's, Doctoral degree). About 28% of the respondents have some vocational education or some other college level education. The distribution of education is relatively similar to the sample surveyed in May 2022.



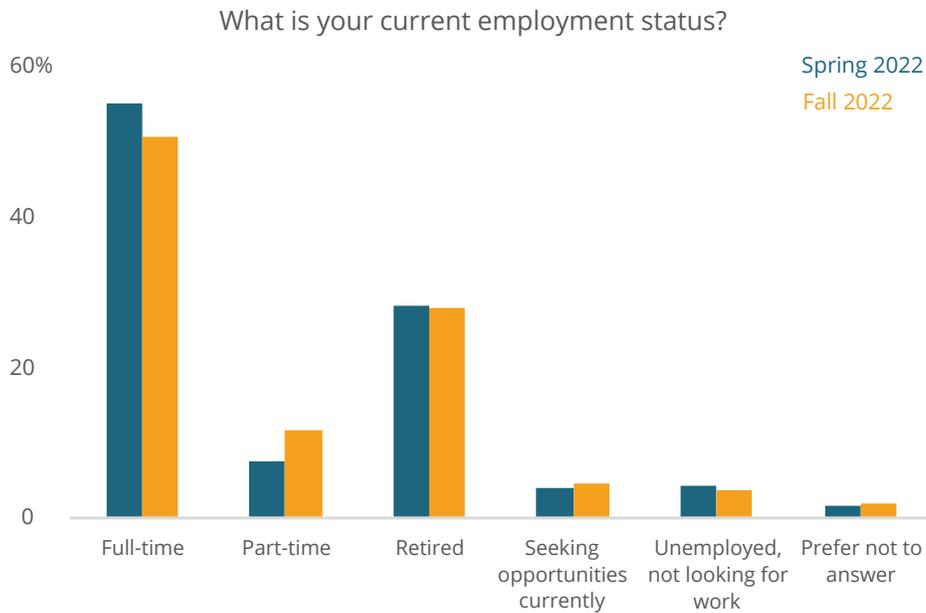
Household income distribution

The figure below shows the distribution of household income for respondents. We see that various earnings brackets were represented in the sample. 35.4% of individuals have annual household income between \$100,000 and \$150,000. This is followed by the household income bracket of \$75,000 to <\$100,000 (16.2%) and \$50,000 to <\$75,000 (16.4%).



Employment status

We depict the distribution of employment status in the figure below. Over 50.4% of the sample was employed full-time, while 27.7% were retired. The remainder were either employed part-time or unemployed.



Limitations

Data from this survey was collected from a convenient sample of adults who responded to our invitation in Spring 2022 and a follow-up invitation in Fall 2022. In total, 1627 individuals completed the survey in the Fall of 2022. 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. We are working on ways to expand this cohort in order to diversify it. Third, the data only provide a snapshot of the individual behavior changes over time from May to November 2022 and include a limited number of metrics. In reality, these limited metrics are not comprehensive of all the problems in the state, and their values can change over time. 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 would 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 and the effects of COVID-19 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.

Acknowledgments

We acknowledge the State of Hawai'i award number 41895, *Coronavirus State Fiscal Recovery Fund*, project title *Data Infrastructure and Analysis for Health and Housing Program and Policy Design - Response to Systemic Economic and Health Challenges Exacerbated by COVID-19* for financially supporting the collection of this information and the development of this report. In addition, data collection and analysis were supported by staff at the [Pacific Alliance Against COVID-19](#) (PAAC), funded under the National Institutes of Health RADx-UP Initiative (U54MD007601-34S2 and OT2HD108105-02). PAAC has been leading 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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