July 9, 2025

MEMO TO: WASSP-1(10) File

F R O M: Shane M. Sinenci, Chair
Water Authority, Social Services, and Parks Committee

SUBJECT: **TRANSMITTAL OF INFORMATIONAL DOCUMENT RELATING TO UPDATE ON MAUI WILDFIRE EXPOSURE COHORT STUDY** (WASSP-1(10))

The attached informational document pertains to Item 1(10) on the Committee's agenda.

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Attachment

UHERO

THE ECONOMIC RESEARCH ORGANIZATION
AT THE UNIVERSITY OF HAWAIʻI

UHERO PUBLIC HEALTH REPORT

From Crisis to Recovery: Health and Resilience Two Years After the Maui Wildfires

JUNE 18, 2025

UHERO Public Health Report
From Crisis to Recovery: Health and Resilience Two Years After the Maui Wildfires
Executive Summary

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Executive Summary

Nearly two years after the August 2023 wildfires, many people in Maui are still living with the emotional, physical, and social effects of the disaster. The flames are gone, but their impact remains. Launched in January 2024, the Maui Wildfire Exposure Study (MauiWES)—the largest post-disaster health cohort in Hawai'i's history—is now following 2,000 adults and children to understand how the community is healing and where more support is needed.

Now in its second year, MauiWES offers a deeper, data-driven view of both the progress made and the challenges that remain. This report highlights three core findings:

1. **Updated findings from the full adult cohort** of 1,800 participants, expanding on our previous report and providing a clearer picture of Maui's post-fire health landscape;
2. The **first comprehensive health snapshot of 200 children**, especially in mental health and respiratory function;
3. **Preliminary longitudinal results from over 400 adults** tracked from Year 1 to Year 2, showing both recovery trends and persistent health concerns.

I. Broader Insights from the Full Adult Cohort Collected Through January 2025

Data collected from the full cohort of 1,800 adults through January 2025 echoes last year's findings and reveals the long arc of recovery. Overall, 41% of adults report worse health compared to the previous year. Half show depressive symptoms, 26% report moderate-to-severe anxiety, and 4.2% have had suicidal thoughts in the past month. Meanwhile, 74% have elevated or hypertensive blood pressure, and over a quarter show reduced lung function.

While insurance coverage has improved significantly, access to care remains a persistent barrier. About one in three participants report difficulty scheduling appointments or getting prescriptions, especially for chronic and respiratory conditions.

The social recovery is equally uneven. About 41% of adults are still living in temporary housing, and 25% remain unemployed but actively looking for work. Despite these struggles, 61% report high levels of support from family and friends—demonstrating the continued strength of community bonds.

II. Child Health: A Call for Sustained Investment

Children in the MauiWES study show signs of physical healing, but their emotional well-being raises serious red flags. Over half (51%) of children ages 10–17 screen positive for depression, with 22% in the severe range. About 30% report anxiety symptoms, and nearly 45% still show signs of PTSD—4.3% at severe levels. One in four report low self-esteem, and many are experiencing functional challenges at school and home.

Cardiopulmonary health is also a growing concern. One in three children had elevated or high blood pressure, with Filipino youth most affected—15.4% falling into Stage 2 hypertension. Nearly 20% of children have impaired breathing capacity, especially among Asian and Filipino children. Girls show slightly more severe lung issues.

These findings point to the need for sustained investment in pediatric care, trauma-informed school services, clean indoor air, and culturally tailored mental health programs. Without early intervention, these risks could become lifelong health burdens.

III. Longitudinal Findings: Recovery in Progress

Among the 1,800 adults enrolled in MauiWES, one-year follow-up data is available for 424 participants. Within this group, we are beginning to see meaningful signs of recovery. Reports of worsened health dropped from 48% in Year 1 to 36% in Year 2. Suicidal thoughts declined by nearly half, and rates of severe depression and anxiety also fell significantly. These improvements suggest that emotional healing is underway for many.

At the same time, some challenges persist. PTSD remains widespread, affecting nearly one in three participants. Physical health indicators—such as lung function—have worsened for many, pointing to gaps in long-term care.

Access to health insurance has improved dramatically, with the uninsured rate cut by 4% thanks to outreach efforts and programs like Kaiser's Hawai'i Health Access Program. Still, many residents—especially in rural areas—struggle to get the chronic and respiratory care they need.

Social stressors remain heavy. Nearly half of participants are still in temporary housing, and food insecurity is a common concern. Yet community resilience shines through: most participants report strong support from family and neighbors—underscoring Maui's strength, solidarity, and determination to heal.

Looking Ahead

Maui is recovering—step by step, community by community. The data suggest that while the road to full recovery remains long, meaningful progress is underway. Strategies such as outreach-driven health insurance enrollment, trusted community partnerships, and culturally rooted social support have helped many residents regain stability. At the same time, long-term challenges like chronic physical health conditions and trauma recovery as well as permanent housing needs require renewed investment and attention.

MauiWES remains a vital tool in Maui's recovery—tracking residents' evolving needs and guiding targeted responses. With the launch of the Maui Health Registry, we are laying the groundwork for long-term monitoring, coordinated care, and efficient resource delivery for those affected. In the wildfire's immediate aftermath, participants were in survival mode—focused on food, shelter, and safety—so many emotional impacts were held in check. As stability improves, deeper psychological effects are surfacing. Ongoing longitudinal tracking is therefore critical to keep a pulse on these shifts, build on the trust we've earned, and ensure that locally grounded strategies continue to foster healing, resilience, and a healthier future for all.

Plain Language Summary

English: Nearly two years after the Maui wildfires, the community is showing encouraging signs of recovery—but important challenges remain. The Maui Wildfire Exposure Study (MauiWES), which includes 2,000 wildfire-affected residents, offers new data on both progress and continued need. Among adults, reports of worsened health and symptoms of depression have started to improve, a sign that emotional healing may be underway. At the same time, many residents still face serious barriers—1 in 3 report difficulty accessing medical care, and nearly half remain in temporary housing.

Most children in the study appear physically healthy, but early signs of mental health strain are emerging, emphasizing the need for ongoing care and attention. Encouragingly, community support remains strong: 3 in 5 participants report dependable support from family or neighbors, and more than half of those who lost jobs after the fires have returned to work.

These findings highlight a community in recovery—but one still facing the long-term impacts of trauma, displacement, and loss. Continued monitoring and sustained support are essential to ensure every resident has the opportunity to heal and rebuild.

Español: Casi dos años después de los incendios forestales en Maui, la comunidad muestra señales alentadoras de recuperación, aunque persisten desafíos importantes. El Estudio de Exposición a los Incendios de Maui (MauiWES), que incluye a 2,000 residentes afectados, ofrece nuevos datos sobre los avances logrados y las necesidades que aún existen. Entre los adultos, los informes de salud deteriorada y síntomas de depresión han comenzado a mejorar, lo que sugiere que el proceso de sanación emocional está en marcha. Al mismo tiempo, muchos residentes aún enfrentan serias barreras: 1 de cada 3 reporta dificultades para acceder a atención médica, y casi la mitad sigue viviendo en viviendas temporales.

La mayoría de los niños en el estudio parecen estar físicamente sanos, pero ya se observan señales tempranas de afectación en su salud mental, lo que resalta la importancia de brindarles atención continua. Afortunadamente, el apoyo comunitario sigue siendo fuerte: 3 de cada 5 participantes dicen contar con el respaldo constante de familiares o vecinos, y más de la mitad de quienes perdieron su empleo tras los incendios ya han regresado al trabajo.

Estos hallazgos reflejan una comunidad en proceso de recuperación, pero que aún enfrenta las secuelas a largo plazo del trauma, el desplazamiento y la pérdida. Es fundamental continuar con el monitoreo y mantener el apoyo para que todos los residentes tengan la oportunidad de sanar y reconstruir sus vidas.

Tagalog: Halos dalawang taon matapos ang mga wildfire sa Maui, may mga positibong palatandaan ng pagbangon ang komunidad—ngunit may mahahalagang hamon pa ring kinahaharap. Ang Maui Wildfire Exposure Study (MauiWES), na kinabibilangan ng 2,000 residente na naapektuhan ng sunog, ay nagbibigay ng bagong datos tungkol sa progreso at sa mga patuloy na pangangailangan. Sa mga matatanda, ang mga ulat ng lumalalang kalusugan at sintomas ng depresyon ay nagsisimula nang bumuti—isang senyales na nagsisimula na ang emosyonal na paghilom. Gayunpaman, marami pa ring residente ang may malubhang balakid—1 sa bawat 3 ang nagsasabing hirap silang makakuha ng medikal na serbisyo, at halos kalahati ay nananatili pa rin sa pansamantalang tirahan.

Karamihan sa mga bata sa pag-aaral ay mukhang pisikal na malusog, ngunit may lumalabas na maagang senyales ng hirap sa kalusugan ng pag-iisip, na nagpapakita ng pangangailangan ng patuloy na atensyon at pag-aalaga. Sa kabutihang-palad, nananatiling matatag ang suporta ng komunidad: 3 sa bawat 5 kalahok ang nagsasabing may maaasahang tulong mula sa pamilya o kapitbahay, at mahigit kalahati ng mga nawalan ng trabaho pagkatapos ng sunog ay nakabalik na sa trabaho.

Ipinapakita ng mga natuklasan na ito ang isang komunidad na nasa proseso ng pagbangon—ngunit patuloy pa ring hinaharap ang pangmatagalang epekto ng trauma, pagkawala ng tirahan, at pagdadalamhati. Mahalaga ang tuloy-tuloy na pagmamatyag at suporta upang matiyak na lahat ng residente ay may pagkakataong maghilom at muling makabangon.

Ilocano: Adu nga dua a tawen kalpasan ti wildfire iti Maui, adda dagiti makapapnek nga indikasiyon ti panagbangon ti komunidad—ngem adda pay dagiti dakdakkel a parikut nga masapul nga atipiren. Ti Maui Wildfire Exposure Study (MauiWES), a naglaon iti 2,000 a residente nga naapektaran ti uram, ket mangipapaay iti baro a datos maipanggep iti progreso ken dagiti kasapulan nga agtultuloy. Kadagiti natataengan, ti ad-adu a nagreklamo iti naurnos a salud ken depresion ket agtutubo ti pannakapnekda—indikasion a mabalin a rumang-ay ti emosional a panagpabannog. Ngem uray kasta, adu pay a residente ti agbirok kadagiti dakkel a parikut—1 kadagiti 3 ti agsao a narigat para kadakuada ti agala ti medikal a tulong, ken agkurang pay laeng ti agtutubo nga agnaed iti agdama a balay.

Kadagiti ubbing a kasali iti pagadalan, kadawyan kadakuada ket naurnos ti physical a salud, ngem adda dagiti umuna a pakita ti stress iti mental a saludda, a mangiparangarang ti kasapulan ti agtultuloy a panangtaripato ken panangipateg kadakuada. Nasayaat met a ti supporta ti komunidad ket agtultuloy: 3 kadagiti 5 a partisipante ti agsao a mabalin da nga asahan ti tulong manipud iti pamilya wenno kadagiti agkakapitbahay, ken bassit laeng ti nakalugan a nagawiden ti trabaho kalpasan ti uram ti saan a nakabalik manen.

Dagitoy a rikna ket mangipakita ti komunidad a makabirok ti dalan ti panagbangon—ngem agbirok pay laeng iti panagtultuloy a parikut kas ti trauma, pannakapukan ti pagtaengan, ken dakes a rikna. Kasapulan ti agtultuloy a panagkita ken suporta tapno amin a residente ket addaan ti gundaway a magilom ken agsubli ti napintas a panagbiag.

lea faka-Tonga: Kuo ua tau talu mei he afi lahopoto ʻi Maui, ʻoku ʻi ai ha ngaahi fakaʻilonga lelei ʻoku fakamahino ai ʻoku kamata ke langa hake hake ʻa e kāinga—ka ʻoku kei ʻi ai pe ngaahi palopalema mahuʻinga ʻoku toe kei fehangahangai mo ia. ʻOku ʻomai ʻe he Maui Wildfire Exposure Study (MauiWES), ʻa ia ʻoku kau ai ha niʻihi ʻe 2,000 naʻa nau pā kovi ʻi he afi, ha ngaahi fakamatala foʻou fekauʻaki mo e ngaahi ngaue lelei kuo lava mo e ngaahi fiemaʻu ʻoku kei ʻi ai. Ki he kakai lahi, ʻoku ʻi ai ha toe fakalelei ʻoku hoko ʻi he moʻui fakafaitoʻo mo e ongo fakaʻatamai, ʻo fakahā ʻoku kamata ke kei moʻui fakalelei ʻa e loto. Ka neongo ia, ʻoku kei ʻi ai ha ngaahi palopalema lahi—taha ʻi he toko tolu ʻoku faingataʻa ke maʻu ha tokoni fakafaitoʻo, pea ʻoku toe tokolahi ʻoku kei nofo pe ʻi he ngaahi fale fakataimi pē.

Ko e toʻutupu ʻoku kau ʻi he ako ko ʻeni ʻoku lahi ʻenau moʻui lelei fakasino, ka ʻoku kamata ke hā mai ha ngaahi fakaʻilonga kimui he moʻui fakakaukau, ʻo fakahaaʻi ʻoku fiemaʻu ke hokohoko atu ʻa e tokanga mo e tokoni. Ko e fakafiefia, ʻoku kei ʻi ai ha poupou ʻoku maʻu mei he kāinga—toko tolu ʻi he toko nima ʻoku pehē ʻoku nau maʻu ha tokoni pau mei he famili pe ngaahi kaungāʻaapi, pea ʻoku toe lahi ʻi he kakaí ne mole ʻa honau ngāue ʻo ʻosi kuo nau toe foki ki he ngāue.

ʻOku fakahā ʻe he ngaahi ola ko ʻeni ha kāinga ʻoku ne fai ʻene feinga ke langa hake—ka ʻoku kei fehangahangai pe mo e ngaahi palopalema tukulolo ʻo e veve, fakalele ʻi fale ʻikai tenge pe, mo e mole. ʻOku mahuʻinga ke hokohoko atu ʻa e vakai mo e tokoni tuʻuloa ke fakapapauʻi ʻe maʻu ʻe ia kotoa pē ha faingamālie ke moʻui lelei mo langa hake hake.

Tiếng Việt: Gần hai năm sau vụ cháy rừng ở Maui, cộng đồng đang cho thấy những dấu hiệu phục hồi đầy hy vọng — nhưng vẫn còn nhiều thách thức quan trọng. Nghiên cứu về Tác động Cháy rừng tại Maui (MauiWES), với sự tham gia của 2.000 người dân bị ảnh hưởng bởi cháy rừng, cung cấp dữ liệu mới về cả tiến triển lẫn những nhu cầu chưa được đáp ứng. Ở người trưởng thành, các báo cáo về sức khỏe suy giảm và triệu chứng trầm cảm đã bắt đầu cải thiện — một dấu hiệu cho thấy quá trình hồi phục tinh thần đang diễn ra. Tuy nhiên, nhiều người dân vẫn gặp khó khăn nghiêm trọng — cứ 3 người thì có 1 người gặp trở ngại trong việc tiếp cận chăm sóc y tế và gần một nửa vẫn đang sống trong các ngôi nhà tạm thời.

Phần lớn trẻ em trong nghiên cứu có sức khỏe thể chất tốt, nhưng đã xuất hiện những dấu hiệu sớm của căng thẳng tâm lý, nhấn mạnh nhu cầu phải tiếp tục chăm sóc và quan tâm. Điều đáng mừng là người dân nhận được nhiều sự hỗ trợ từ cộng đồng: 3 trong số 5 người tham gia cho biết họ nhận được sự hỗ trợ đáng tin cậy từ gia đình hoặc hàng xóm và hơn một nửa số người mất việc sau vụ cháy đã quay trở lại làm việc.

Những phát hiện nghiên cứu này cho thấy một cộng đồng đang trên đà phục hồi — nhưng vẫn phải đối mặt với những ảnh hưởng lâu dài của sang chấn, mất mát và di dời. Việc tiếp tục theo dõi và duy trì hỗ trợ là điều thiết yếu để đảm bảo rằng mọi người dân đều có cơ hội để phục hồi và xây dựng lại cuộc sống.

中文: 在毛伊岛野火发生近两年后，当地社区已经展现出令人鼓舞的恢复迹象——但仍面临许多重要挑战。毛伊岛野火暴露研究（MauiWES），涵盖了2,000名受灾居民，提供了关于复原进展和持续需求的新数据。在成年人群中，健康状况恶化和抑郁症状的报告已有所改善，这是情绪逐渐愈合的迹象。然而，许多居民仍面临严重障碍——每三人中就有一人表示难以获得医疗服务，近一半人仍住在临时住所中。

研究中的大多数儿童身体健康，但也出现了早期心理压力的迹象，突显出持续照护和关注的必要性。令人欣慰的是，社区支持依然强劲：五分之三的参与者表示可以依靠家人或邻居的支持，超过一半在火灾后失业的人已重返工作岗位。

这些发现反映了一个正在恢复的社区——但依然深受创伤、流离失所和失去亲人等长期影响的困扰。持续监测和长期支持对于确保每一位居民都有机会康复与重建至关重要。

Introduction

On the evening of August 8, 2023, fast-moving wildfires swept through West and Upcountry Maui, taking over 100 lives, destroying more than 2,300 homes, and displacing thousands of residents. Long after the flames were extinguished, the community still asked the same questions: *How is the smoke/ash affecting my health? Will the stress ever lift? What will happen to our children who have lived this trauma so young?*

Because no single clinic, agency, or hospital could answer those questions alone, the University of Hawai'i at Mānoa (CSS/UHERO, JABSOM) partnered with grassroots organizations—Roots Reborn, Maui Medic Healers Hui, Tagnawa for Maui, Hui No Ke Ola Pono, the Lahaina Comprehensive Health Center, and several more community organizations supporting survivors—to launch the Maui Wildfire Exposure Study (MauiWES). With generous support from the Hawai'i Community Foundation's Maui Strong Fund, Kaiser Permanente, the State of Hawai'i, and the National Institutes of Health, MauiWES set out to document not only the damage left behind but the pathways to recovery.

Over the past eighteen months the research-outreach teams have met survivors where they are—hotel parking lots, church halls, pop-up tents in Lahaina, Wailuku, Kihei and Kula—offering free health screenings, mental-health check-ins, and an opportunity to make their voices heard. By January 2025, more than 2,000 adults and children had enrolled, making MauiWES the most comprehensive post-disaster health study in state history. Each participant received immediate, personalized results; all participants will be followed annually so the community and its leaders can see what is getting better, what is getting worse, and what still needs attention.

This report distills the first two years of data into a community-friendly narrative. The pages that follow describe how the study was conducted, what it is finding, and—most importantly—how those findings can steer policy and aid toward the people and places that need them most.

Study Design and Methods

In the months following the 2023 wildfires, it became evident that Maui needed a systematic, community-anchored approach to track the health of fire survivors over time. That impulse gave birth to the Maui Wildfire Exposure Study (MauiWES)—a partnership between University of Hawai'i researchers led by Drs. Alika Maunakea and Ruben Juarez with local grassroots groups including Roots Reborn, Maui Medic Healers Hui, and Tagnawa for Maui. From the outset, the guiding principles were simple: go to where the people are, speak in the languages they trust, and give something back the very same day.

Community-based recruitment

Beginning in January 2024, the research-outreach team set up health screening events at accessible locations where survivors were living or gathering: the ballroom of the Royal Lahaina Resort (then a major shelter site), the J. Walter Cameron Center in Wailuku, the open-air pavilion at Kula Lodge, church halls, schools, the Lahaina Comprehensive Health Center, UH Maui College, and clinics across Maui. Bilingual community navigators welcomed residents in multiple languages—including English, Tagalog, Ilocano, and Spanish—provided clear explanations of the study in plain language, answered questions, and guided each individual through the informed consent process.

What participants did—and what they received?

Each participant's visit took approximately one hour. Participants first completed a comprehensive questionnaire, either in-person or online, covering wildfire exposure, housing, employment, food security, and mental health—using validated tools such as the CES-D (depression), GAD-7 (anxiety), Rosenberg Self-Esteem Scale, and the Multidimensional Scale of Perceived Social Support.

Following the questionnaire they then completed a basic health check: height, weight, automated blood pressure reading, pulse and oxygen saturation. A blood sample was tested on-site using the i-STAT system to measure electrolytes, lactate, kidney function, and blood sugar. Lung function was assessed using a spirometer and oscillometer, which measured both how much air they could exhale (forced vital capacity) and how quickly (forced expiratory volume in one second)—important indicators of possible smoke-related lung damage.

All adults were offered in-person consultations to review their physical and mental health results. Each received a printed summary, access to the MauiWes Health Portal, appropriate referrals, and a $100 incentive for participating.

Who enrolled?

By January 2025, MauiWES had welcomed 1,800 adults and 200 children. Women made up 61% of adult participants. The racial and ethnic mix was unusually diverse for a research cohort: 30% White, 20% Native Hawaiian or other Pacific Islander, 19% Filipino, 18% Hispanic/Latino, and 9% non-Filipino Asian, closely reflecting the racial composition of the affected regions pre-wildfire. Six in ten adults were between 35 and 64 years old—the very life stage where job loss, mortgage stress, and caring for both kids and elders collide. Financially, the cohort skewed lower-income: one-third lived below the federal poverty line, and another third hovered within 50 percent above it.

What data were collected?

Alongside survey responses and point-of-care tests, the team collected small samples of venous blood, saliva, urine, and cheek-swabs. These specimens are frozen at –80 °C in Honolulu, creating a biobank that future toxicology, transcriptomics, metabolomics, and epigenetic studies can draw upon—important, because the long-term biological effects of massive wildfire smoke exposure remain poorly understood.

A note on representativeness

Because MauiWES relies on voluntary participation at outreach events, the sample cannot perfectly represent every wildfire survivor. Residents who moved off-island, are homebound, or have low trust in formal institutions remain underrepresented.

That said, the study has made significant efforts to reach a broad cross-section of the community. By using multiple recruitment sites, multilingual navigators, and offering evening and weekend hours, MauiWES has successfully included many voices often left out of large health studies—particularly Hispanic/Latino, Filipino, and Native Hawaiian households.

Importantly, the study also includes individuals who were indirectly exposed to the wildfires, such as essential workers, volunteers, and residents affected by smoke, ash, or displacement—even if they did not lose a home. This approach helps ensure that the full scope of health and social impacts across Maui is better understood.

Benchmarks for "normal"

To understand how wildfire-affected residents are doing compared to before the disaster, MauiWES uses data from the UHERO Rapid Survey—a rolling online panel of Maui residents launched in May 2023, just three months before the fires. This local dataset serves as a baseline for key indicators such as mental health, insurance coverage, and food security. When Maui-specific numbers are limited, statewide UHERO data provides additional context.

By combining community-based outreach, on-site testing, validated surveys, and long-term follow-up with a public-facing dashboard, MauiWES delivers both real-time feedback to participants and the long-term data needed to guide recovery efforts and policy decisions across Maui. The study also helps identify emerging issues and gaps—highlighting areas that require further research to better support the health and well-being of wildfire-affected communities.

I. Updated Health and Social Impacts from Full Adult Cohort

This section expands upon our previous report, which included findings from 679 adults, to now reflect data from all 1,800 adult participants enrolled in the study. The new data largely confirms the earlier findings, reinforcing key patterns while providing a more complete and representative view of community health.

Among adults surveyed 6 to 18 months after the 2023 wildfires, over 40% reported that their health is worse than it was a year ago—reflecting both lingering physical and emotional impacts. This trend is closely tied to exposure. More than half (52%) of those exposed to wildfire ash, smoke, or debris at least weekly reported worsened health, compared to just 23% among those who were never exposed. Conversely, only 14% of the frequently exposed group reported improved health, while nearly one in four (23%) of those never exposed said their health had gotten better. These patterns underscore the lasting toll of environmental exposure and the importance of continued monitoring and care **(Figure 1)**.

Figure 1. Compared to one year ago, how would you rate your health in general now? By exposure to wildfire ash, debris, and smoke

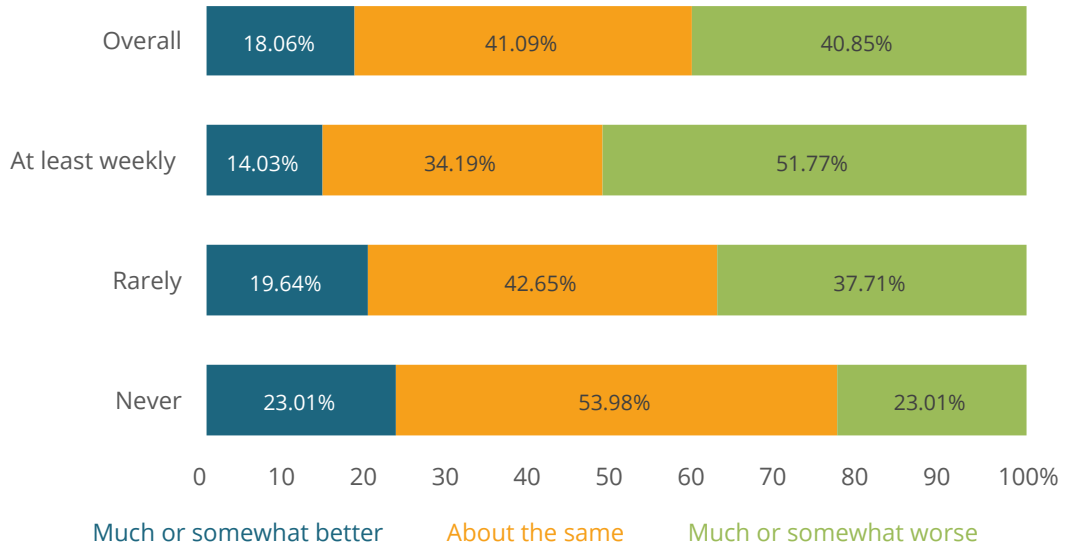


Figure 1. Self-Rated Health Compared to One Year Ago (Full Cohort)

- Worse: 41% | Same: 41% | Better: 18%
  Why it matters: Despite signs of resilience, nearly half of all adults still feel their overall health has declined since the fires. This finding mirrors the experience of both West and Upcountry Maui and reinforces the need for continued investment in whole-person recovery.

A. Mental Health Update

Depressive symptoms remain widespread in the community. Half (49.6%) of MauiWES participants screen positive for some level of depression, with 9.5% meeting the threshold for severe symptoms. These figures represent a substantial increase over pre-fire benchmarks: in UHERO's Maui sample, only 28.3% had depressive symptoms, and just 5.8% were in the severe range. Statewide pre-fire levels were even lower. Only half of MauiWES participants report no depressive symptoms at all, compared to nearly 69% in the broader population before the disaster. These results suggest that depression remains a major and persistent concern for many survivors **(Figure 2)**.

Anxiety has similarly intensified since the fires. Among MauiWES participants, 26% experience moderate to severe anxiety, with nearly 12% in the severe category. This is more than 10 times higher than the pre-fire UHERO Maui severe anxiety rate of 1.6%, and well above the 2.1% statewide rate. Only 42% now report minimal anxiety, compared to 74% before the fires on Maui. These elevated anxiety levels—still present up to 18 months after the disaster—point to the need for sustained support and trauma-informed mental health care **(Figure 3)**.

Self-esteem, a critical buffer against chronic stress and mental illness, has also declined post-disaster. In the MauiWES cohort, 21.5% of participants report low self-esteem—significantly higher than pre-fire levels of 15% in Maui and 13% statewide. Although most adults still report normal or high self-esteem, the drop highlights an underlying erosion of emotional stability and sense of self-worth among fire survivors, particularly as uncertainty around housing, employment, and health continues **(Figure 4)**.

Rates of suicidal thoughts have more than quadrupled since before the fires. In the past month, 4.2% of MauiWES adults reported seriously considering suicide. This is a sharp increase from the UHERO Maui baseline of 0.8% and the statewide rate of 1.2%. While small in absolute terms, the increase signals a critical mental health risk—especially in combination with high levels of depression, anxiety, and diminished self-esteem. These findings call for continued investment in suicide prevention strategies, peer support networks, and culturally responsive crisis services accessible across the island **(Figure 5)**.

Figure 2. Depression

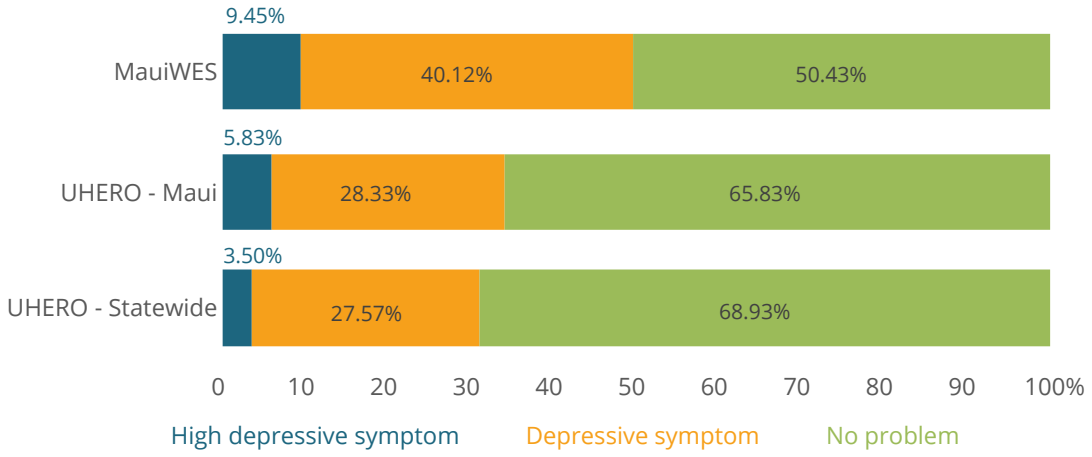


Figure 2. Adult Depression Prevalence (CES-D-20)

- Screen positive for depression: 50% | Baseline (pre-fire): 34.2%
  Why it matters: Depression remains the most common mental health condition post-fire, with current rates nearly double baseline levels. This highlights the ongoing need for trauma-informed counseling and culturally responsive behavioral health services across the island.

Figure 3. Anxiety Severity

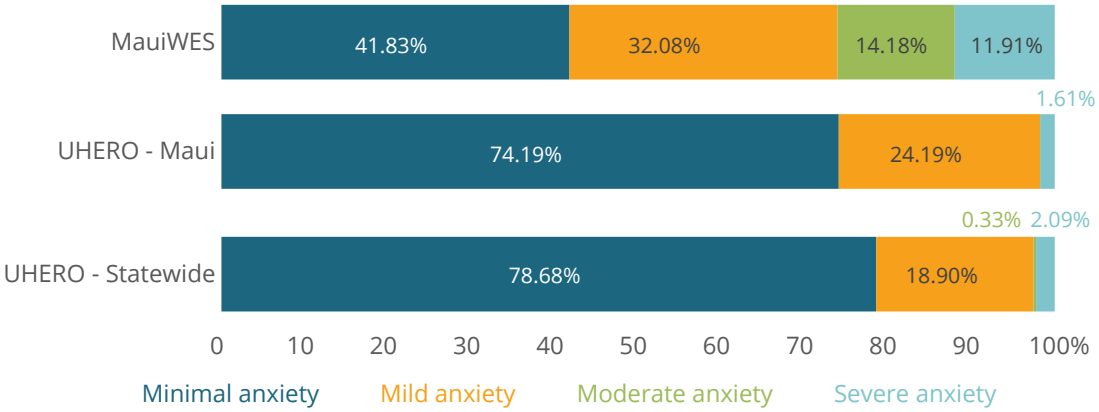


Figure 3. Adult Anxiety Prevalence (GAD-7)

- Moderate to severe anxiety: 26% | Baseline (pre-fire): 2%
  Why it matters: More than 1 in 4 adults experience clinically significant anxiety—over ten times higher than the typical rate on Maui before the wildfires. Left unaddressed, this level of chronic stress can affect both physical health and daily functioning.

Figure 4. Self-esteem

Figure 4. Low Self-Esteem Among Adults (Rosenberg Scale)

- Low self-esteem: 22% | Baseline (pre-fire): 15%
  Why it matters: Self-esteem is a vital indicator of emotional recovery and future well-being. The post-disaster drop signals that many continue to experience reduced confidence, identity disruption, and social withdrawal.

Figure 5. During the past month, did you ever seriously consider attempting suicide?

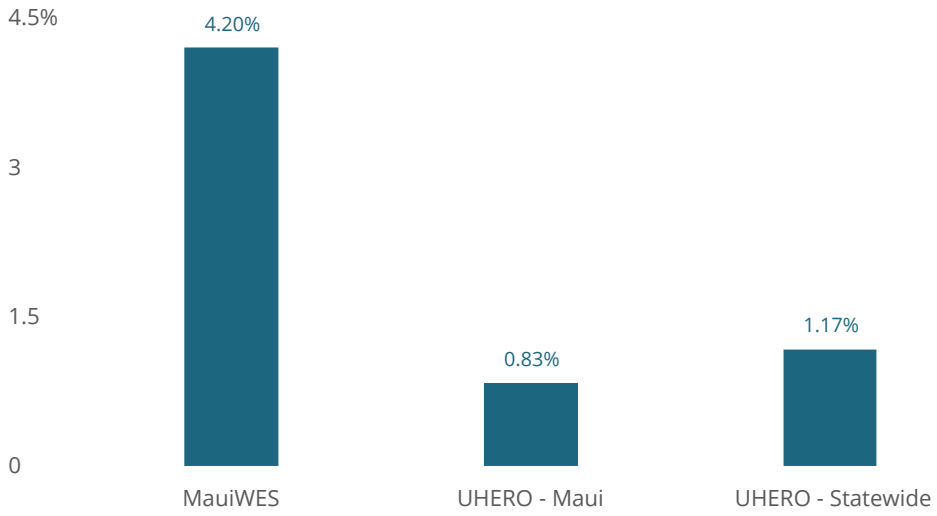


Figure 5. Suicidal Ideation in the Past Month

- Reported thoughts of self-harm: 4.2% | Baseline (pre-fire): 0.8%
  Why it matters: While this figure is a small proportion, it translates to dozens of residents considering suicide each month. This sustained mental health emergency underscores the importance of suicide prevention, peer support, and crisis response services.

B. Physical Health Update

More than a year after the wildfires, significant health impacts remain visible across the MauiWES cohort. Blood pressure readings present a concerning trend: nearly 45% of adults (43.4%) fall in the "Stage 1 hypertension" category, 21.1% meet the threshold for Stage 2 hypertension, and 9.4% are in Elevated—leaving just 26.1% with normal readings. These results suggest that early cardiovascular strain is widespread and may be exacerbated by prolonged stress, unstable housing, and disrupted routines **(Figure 6)**.

Respiratory health also shows signs of lasting impact. On spirometry testing, 83.1% of participants had normal forced vital capacity (FVC), but 15.4% showed mild to moderate restriction and 1.6% showed severe limitation **(Figure 7)**. Forced expiratory volume (FEV_1) results are more concerning:

22.3% show moderate obstruction and 5.3% have severe or very severe obstruction, leaving only 72.4% with normal lung function **(Figure 8)**. These findings point to a meaningful portion of the population experiencing diminished lung function—likely tied to prolonged wildfire smoke exposure and persistent environmental contaminants.

Despite a post-disaster push to expand insurance coverage, many survivors continue to face care barriers. Based on data collected 6 to 18 months after the fires, 32% of participants reported ongoing difficulties accessing medical care or prescriptions, with 22.2% attributing these challenges directly to wildfire-related disruptions **(Figure 9)**. At the same time, 12.5% of participants remained without health insurance **(Figure 10)**, with Hispanic/Latino residents disproportionately affected—38.6% remain uninsured **(Figure 11)**. These care gaps complicate the management of chronic conditions and may contribute to the worsening health metrics observed.

Housing stability and employment also intersect with physical health. While 46.8% of respondents are back in their original homes, 41.1% still reside in temporary housing and 12.1% have relocated permanently **(Figure 12)**. Just 71.5% of participants report feeling secure in their current housing—significantly lower than statewide or pre-fire baselines **(Figure 13)**. Employment status shows a fragile recovery: 56.2% are employed, but 25.1% remain actively seeking work, and another 8.5% are not working and not looking **(Figure 14)**. These stressors can exacerbate both physical and mental health challenges, particularly when combined with limited access to medical services.

Yet amidst these pressures, Maui's community bonds remain strong. About 62% of participants report high levels of perceived social support, while another 27.5% report moderate support **(Figure 15)**. This resilience—anchored in 'ohana, culture, and community networks—continues to serve as a buffer against the long-term health consequences of disaster. However, data suggest that resilience alone cannot close the gaps. Investments in long-term care access, chronic disease screening, and respiratory follow-up are critical to avoid deepening health disparities and to promote sustained recovery for Maui's fire-affected communities.

Figure 6. Blood Pressure Categories

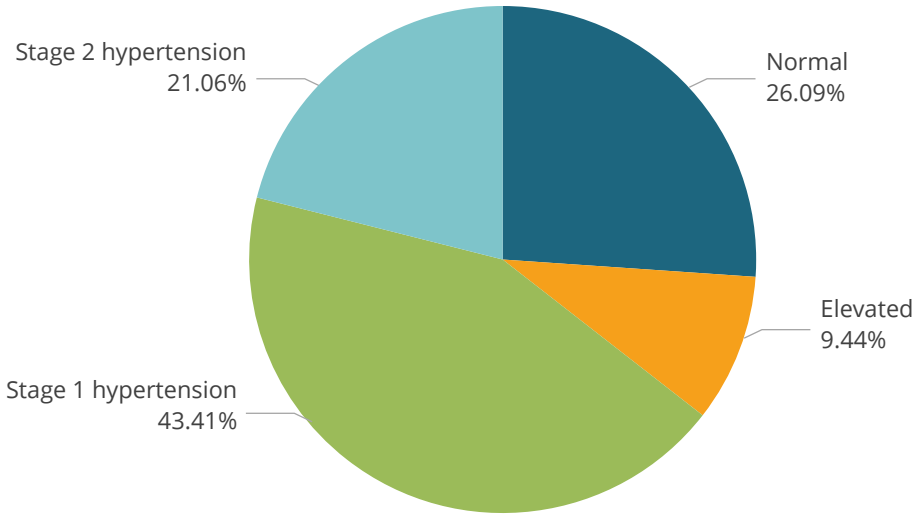


Figure 6. Blood Pressure Categories (ACC/AHA 2017 Guidelines)

- Normal: 26% | Elevated: 9.4% | Stage 1 Hypertension: 43.4% | Stage 2 Hypertension: 21.1%
  Why it matters: Three out of four adults (74%) now meet criteria for elevated or hypertensive blood pressure. This is a major cardiometabolic risk factor and demands long-term public health investment in diet, exercise, and chronic disease care.

Figure 7. Spirometer reading: Forced Vital Capacity

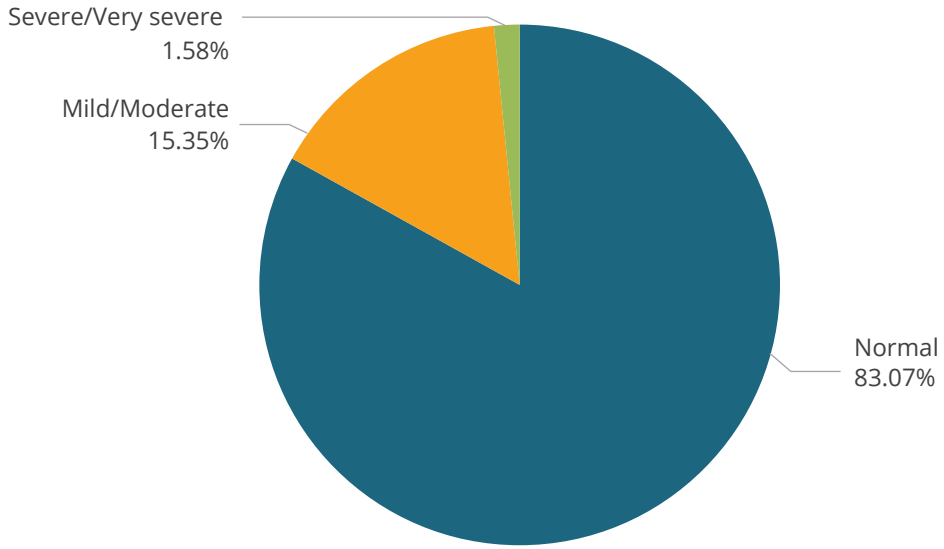


Figure 7. Forced Vital Capacity (FVC) Impairment

- Normal lung capacity: 83% | Impaired (below normal): 17%
  Why it matters: Reduced FVC can indicate long-term exposure to smoke, mold, or pollutants. One in four adults are affected, requiring expanded access to respiratory screening, treatment, and indoor air interventions.

Figure 8. Spirometer reading: Forced Expiratory Volume

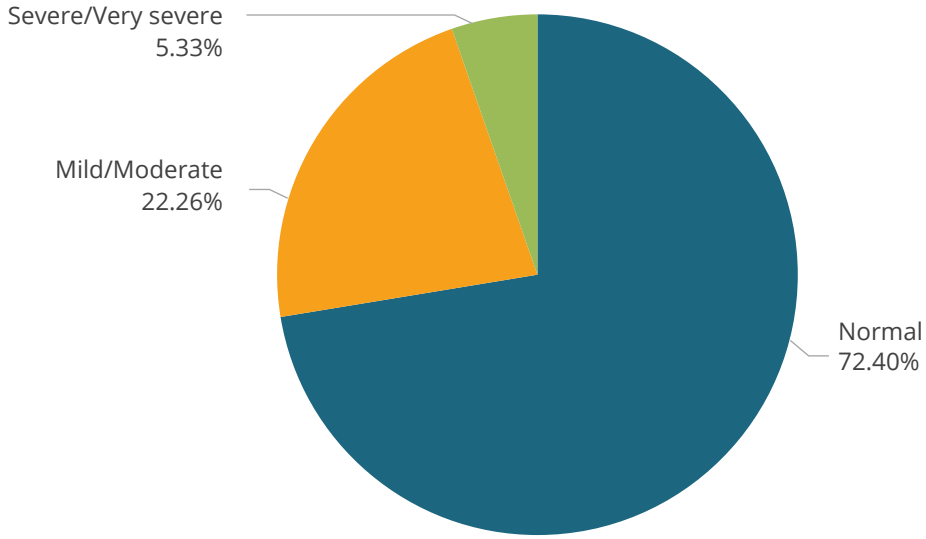


Figure 8. Forced Expiratory Volume in 1 Second (FEV_1) Impairment

- Normal: 72% | Mild/Moderate Obstruction: 22.3% | Severe Obstruction: 5.3%
  Why it matters: Persistent obstruction—affecting 1 in 4 adults—points to structural damage to the airways. Long-term exposure may have worsened asthma or COPD and demands greater access to pulmonology and preventive lung care.

Figure 9. Did you have any difficulties accessing medical care or medications?

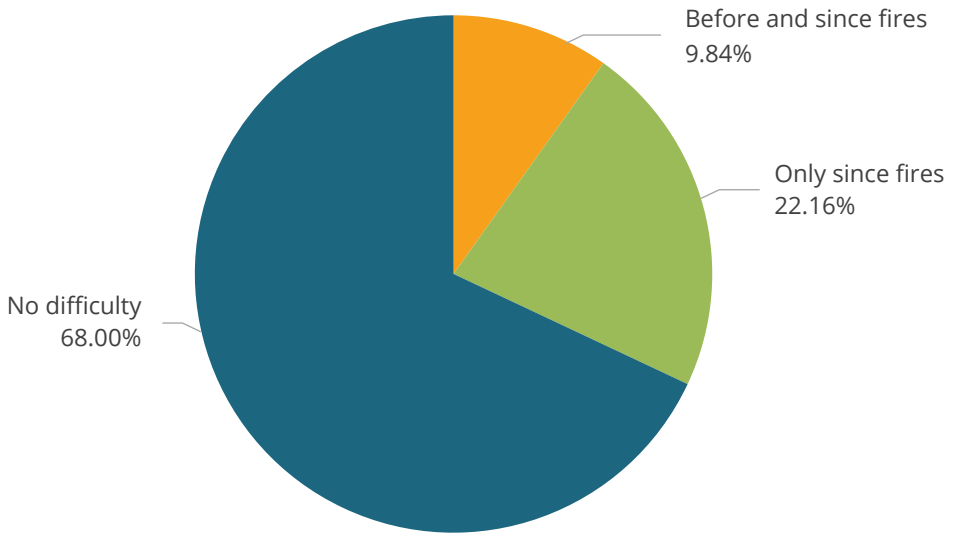


Figure 9. Difficulty Accessing Care or Medications

- No barriers: 68% | Report difficulty: 32%
  Why it matters: Even with expanded insurance coverage, 1 in 3 still struggle to get medical care or prescriptions. This reflects ongoing clinic shortages, transportation barriers, and service gaps, especially in West Maui.

Figure 10. Do you currently have health insurance?

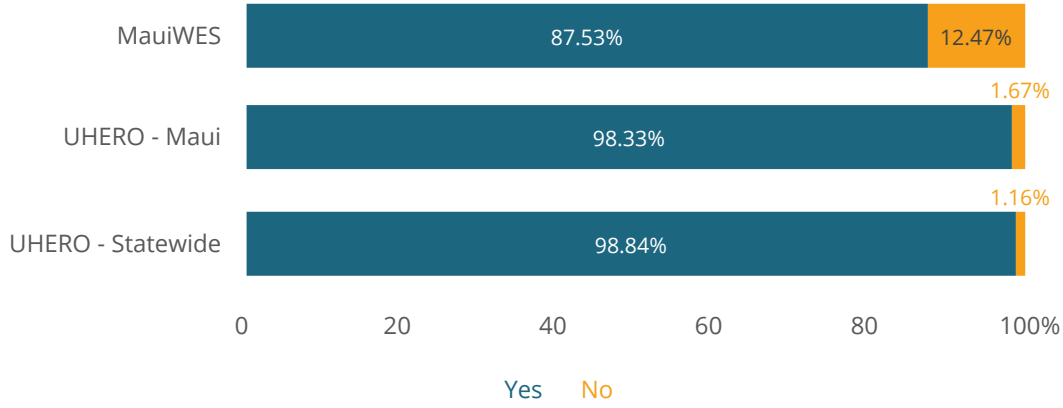


Figure 10. Current Insurance Coverage

- Insured: 87.5% | Uninsured: 12.5% | Baseline (pre-fire): 98.8% insured
  Why it matters: Community outreach programs have significantly improved coverage, cutting the uninsured rate nearly in half from earlier in the recovery. However, 1 in 10 adults remain without insurance, leaving them vulnerable to unmet health needs.

Figure 11. Do you currently have health insurance?

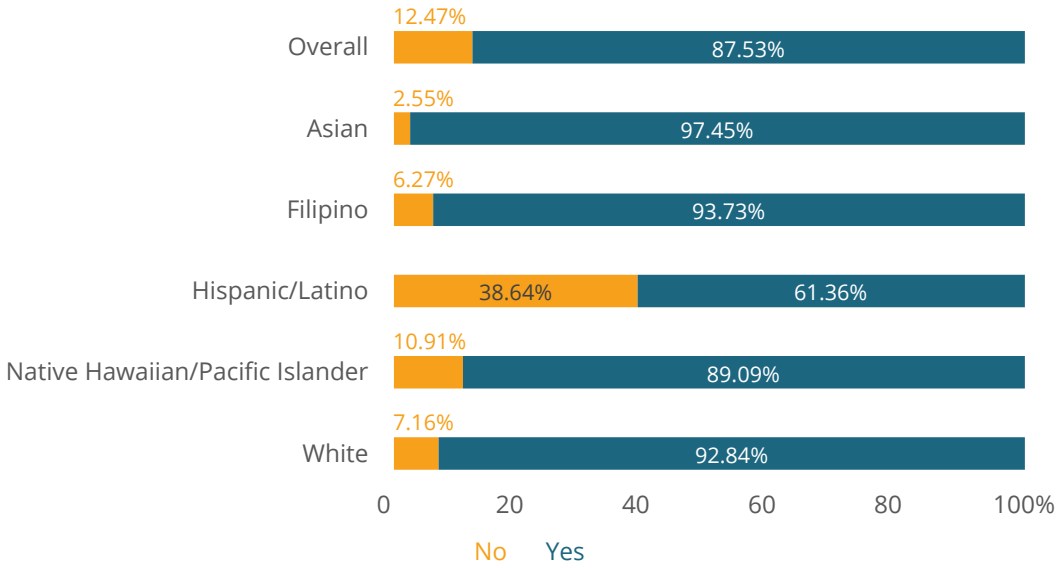


Figure 11. Uninsured Rate by Race/Ethnicity

- Hispanic/Latino: 38.6% | Native Hawaiian/Pacific Islander: 10.9% | White: 7.2% | Filipino: 6.3% | Asian: 2.5%
  Why it matters: Stark racial disparities persist. Nearly 40% of Hispanic/Latino participants remain uninsured—highlighting urgent need for linguistically and culturally appropriate enrollment efforts.

Figure 12. Are you currently living in your original home, temporary house, or a new permanent location?

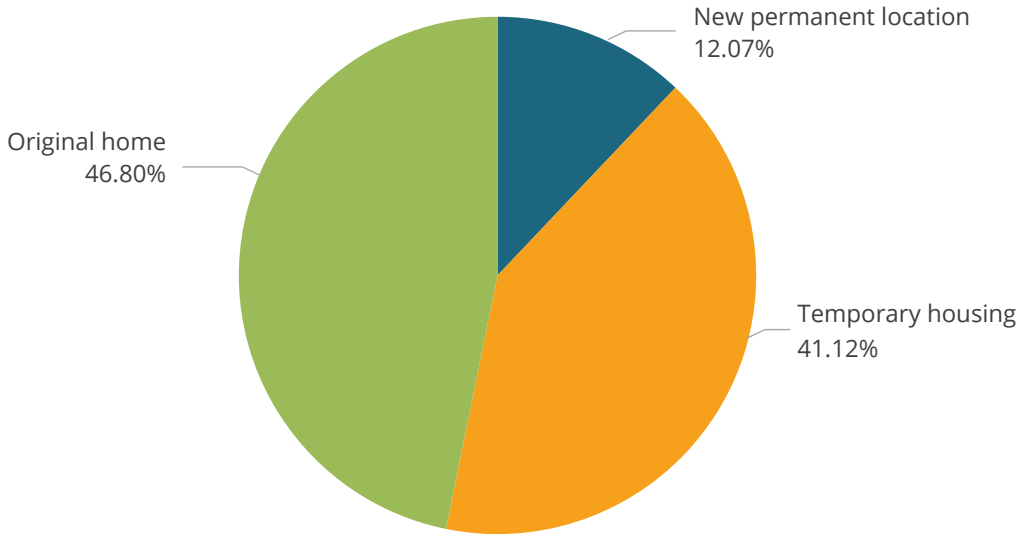


Figure 12. Current Housing Status

- Temporary Housing: 41% | Permanent Housing: 59%
  Why it matters: Two years post-fire, more than 4 in 10 adults still lack stable housing. The connection between housing and health makes this one of the most urgent recovery priorities for local and state leaders.

Figure 13. Do you feel secure in your current housing situation?

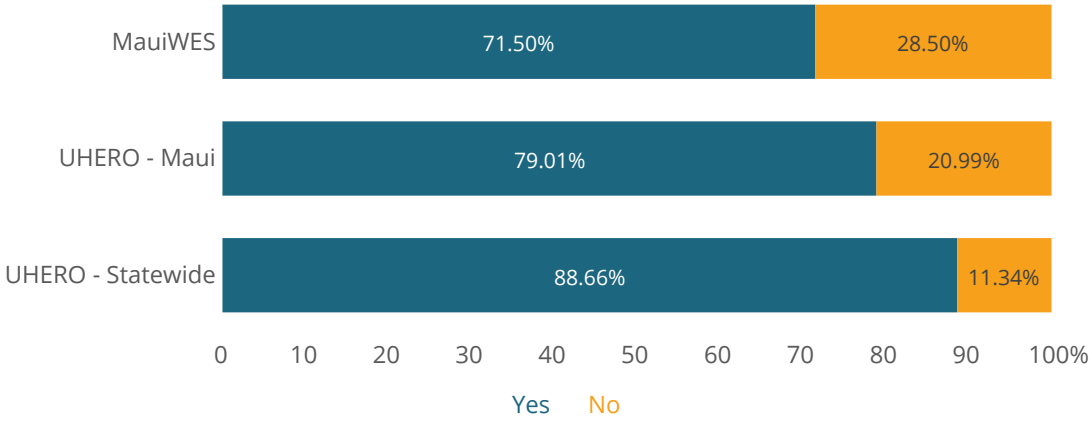


Figure 13. Perceived Housing Security

- Secure: 71.5% | Insecure: 28.5%
  Why it matters: Even among those in permanent housing, one-quarter worry about losing their current living situation. This psychological burden can undermine recovery and heightens the need for long-term rental and homeownership support.

Figure 14. What is your current employment status?

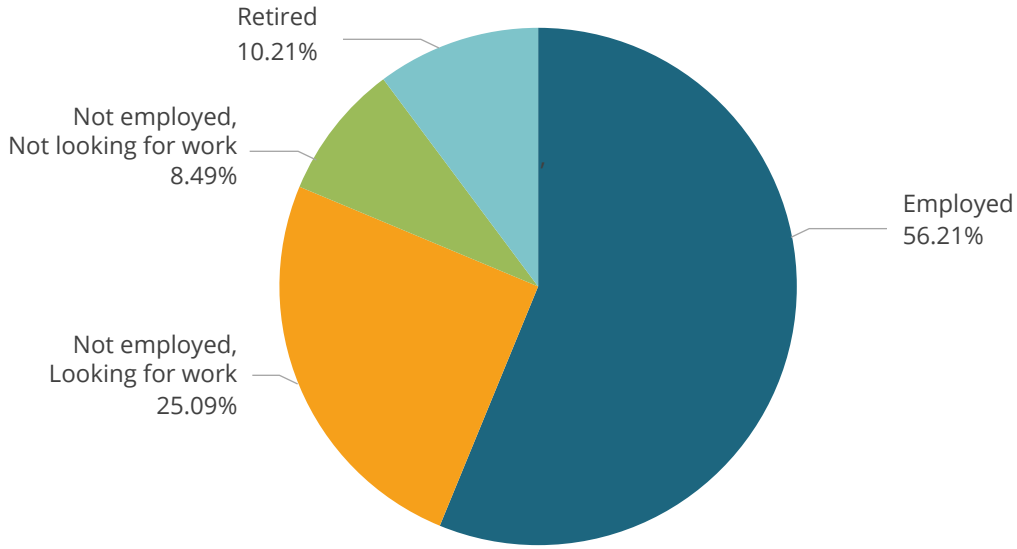


Figure 14. Employment Status

- Employed: 56% | Job-Seeking: 25% | Not in Labor Force (caregiving, retired, unable to work): 19%
  Why it matters: A quarter of participants are still looking for work—indicating major disruptions in the local labor market. Workforce development, retraining, and childcare access are key to economic recovery.

Figure 15. Multidimensional Scale of Perceived Social Support

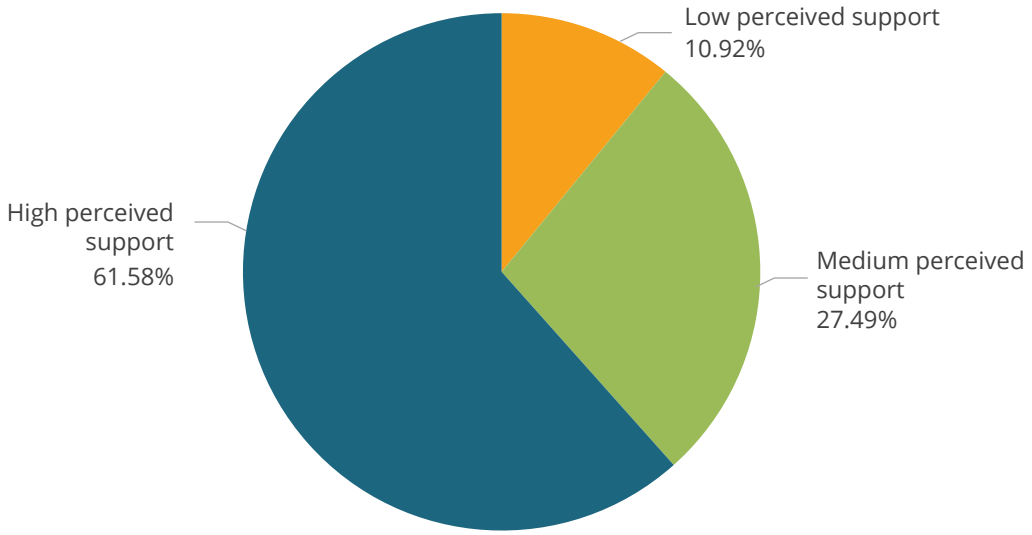


Figure 15. Perceived Social Support

- High: 61% | Medium: 28% | Low: 11%
  Why it matters: Most participants still feel supported by family, friends, or their community. But 1 in 8 report low support, suggesting they are at elevated risk for isolation and poor health outcomes. They should be prioritized in outreach and intervention strategies.

C. Summary

Eighteen months after the wildfires, the full MauiWES cohort paints a sobering picture: recovery remains uneven, and for many, health has worsened. Nearly half of adults (42%) report declining overall health, with the burden falling heaviest on those still exposed to ash, smoke, and debris. These impacts are not abstract—they show up in real symptoms, diagnoses, and unmet needs across Maui's fire-affected population.

Mental health challenges remain especially urgent. Depression now affects over half of all participants, with severe symptoms almost doubling from pre-fire levels. Anxiety is up tenfold compared to earlier benchmarks. Self-esteem has eroded, and rates of suicidal thoughts have quadrupled, pointing to deep psychological scars and a need for sustained, culturally grounded mental health care—beyond crisis response.

Physical health concerns mirror this trend. Most adults have hypertensive or elevated blood pressure. A quarter show signs of impaired lung function, including moderate to severe obstruction—often tied to prolonged smoke exposure. These are not short-term issues; they are warning signs of potential long-term chronic disease if left unaddressed.

Access to care remains a barrier. Despite coverage expansion efforts, 1 in 10 participants remains uninsured, and many, especially Hispanic/Latino residents, are disproportionately left out. Nearly a third report persistent difficulty accessing care or medications. These gaps undermine recovery—especially for those juggling chronic conditions, unstable housing, and job insecurity.

Yet amid these challenges, Maui's social fabric remains a strength. Over 60% of participants report strong community support, and these relationships provide critical resilience. But resilience alone cannot close systemic gaps in care, housing, and opportunity.

Synthesis: The fire's impact continues to ripple across health, housing, employment, and emotional well-being. The data underscore a clear need for long-term investment in trauma-informed mental health care, chronic disease management, and equitable access to services. Maui's communities are strong—but they need more than strength to recover fully. They need sustained support, accountability, and action.

II. Tracking the Health of Children Post-Wildfire

Between October 2024 and January 2025, MauiWES enrolled nearly 200 children ages 10 to 17 whose families were already participating in the adult study. Each child took part in brief, validated mental health surveys and underwent on-site health screenings, including blood pressure checks, lung function tests, and basic height and weight measurements. The sample reflects Maui's rich diversity: about 36.7% of participants identified as Native Hawaiian, Filipino (32.8%), Hispanic/Latino (22.7%), or White (34.3%), with the rest identifying as Other Asian or multi-ethnic. Around 54% self-identified as male. Among these fire-affected children, a clear pattern emerged: emotional and mental health challenges are more pronounced than physical issues, though early signs of physical health risks are also present. **Figures 16–28** summarize the key findings.

A. Mental Health Snapshot

Nearly two years after the fires, Maui's youth are still carrying a heavy emotional burden. We assessed every child (ages 10–17) with four gold-standard tools—the CES-D-20 for depression, SCARED-5 for anxiety, PCL-5 for PTSD, and Rosenberg Self-Esteem Scale. The pattern is clear: elevated scores remain the rule, not the exception.

Across the full child cohort, 22% of children report severe depressive symptoms, with another 28% showing mild to moderate levels. Only 49% show no or minimal symptoms **(Figure 16)**. Racial differences are notable. Severe depression affects 33% of Hispanic/Latino and 31.6% of Filipino children, compared to 25% of Asian, 21% of Native Hawaiian/Pacific Islander, and 20.7% of White youth. Native Hawaiian and Pacific Islander children, while slightly lower in severe depression, show the highest rates of mild to moderate symptoms (37%), signaling broader psychological strain **(Figure 16)**. By gender, 22.9% of girls experience severe depressive symptoms compared to 19.4% of boys. Girls are also more likely to report mild to moderate depression (31.1% vs. 25.8%). Boys are somewhat more likely to report no or minimal symptoms (54.8% vs. 46%) **(Figure 17)**.

PTSD remains widespread among children, with only 54.8% overall reporting little or no symptoms. Around 30% show mild PTSD symptoms, while 10.8% meet clinical thresholds for PTSD and 4.3% for severe PTSD **(Figure 18)**. Hispanic/Latino youth are most affected, with 23% meeting criteria for PTSD and 10.3% falling in the severe range. Hispanic/Latino children have the highest rate of severe PTSD (10.3%), followed by Asian children. Native Hawaiian/Pacific Islander children show high levels of mild symptoms (36%) but slightly lower rates of clinical PTSD **(Figure 18)**. By gender, girls show marginally higher rates of severe PTSD (4.7% vs. 3.2%) and slightly fewer report "little to no" symptoms compared to boys (57% vs. 55%). This highlights a need for sustained gender- and culture-specific trauma support **(Figure 19)**.

Nearly 30% of children screen positive for a probable anxiety disorder. Rates are especially high among Asian (37%), Filipino (36.9%), and Hispanic/Latino (33.3%) youth. Native Hawaiian/Pacific Islander children report the lowest anxiety burden (24%), although this still represents nearly 1 in 4 youth **(Figure 20)**.

Low self-esteem is prevalent across all groups. Nearly one-quarter (23%) of children report low self-worth. This rises to 35.3% among Asian, 31.3% among Filipino, and 30.2% among Hispanic/Latino children. Native Hawaiian/Pacific Islander and White children have the lowest—but still concerning—rates (21.2% and 22.7%, respectively) **(Figure 21)**. By gender, 25.9% of girls report low self-esteem versus 21.9% of boys, underscoring an emerging gender disparity in confidence and self-image **(Figure 22)**.

These findings reinforce that emotional recovery among children is uneven and deeply affected by race and gender. Filipino, Asian, and Hispanic/Latino children consistently show higher mental health burdens across depression, PTSD, anxiety, and self-esteem. Girls, in particular, report more internalizing symptoms—especially low self-esteem and moderate depression—pointing to a need for early, culturally rooted, and gender-responsive interventions in schools and youth programs.

Figure 16. Depression CES-D 20 Items by Race

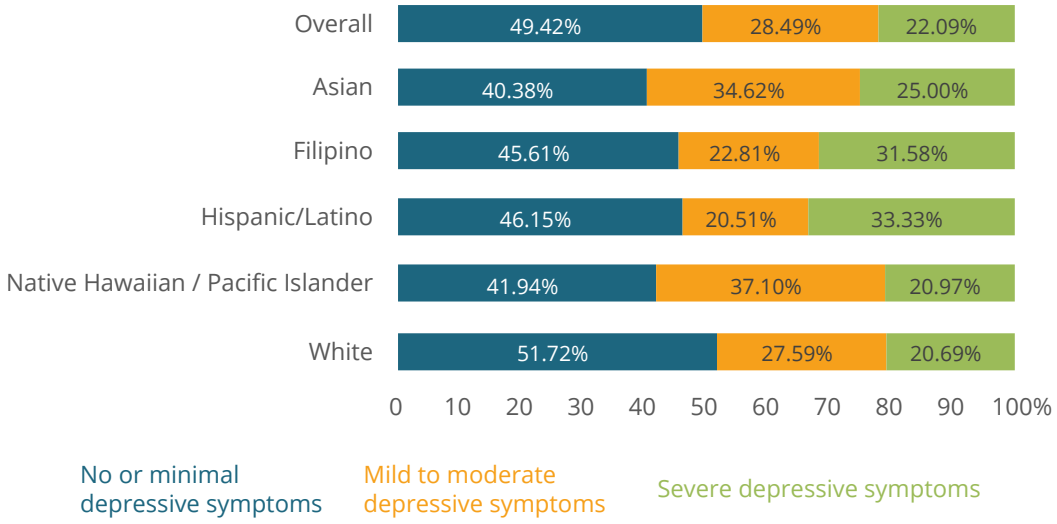


Figure 16. Child Depression Severity (CES-D-20)

- 49% of children show no or minimal symptoms, while 29% report mild to moderate symptoms, and 22% fall into the severe range.
  Why it matters: Over half of children screen positive for depression, highlighting a need for expanded youth mental health services.

Figure 17. Depression CES-D 20 Items by Gender

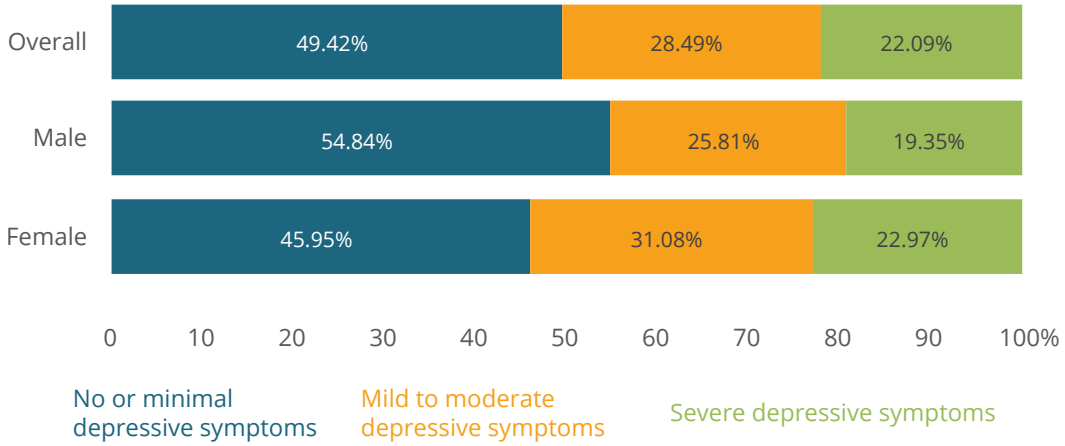


Figure 17. Child Depression by Gender (CES-D-20)

- Severe depression: 23% of females vs. 19% of males; Mild/moderate: 31% of females vs. 26% of males
  Why it matters: Female participants report higher levels of depressive symptoms—particularly in the mild-to-moderate range—indicating a need for gender-responsive mental health support.

Figure 18. PTSD by Race

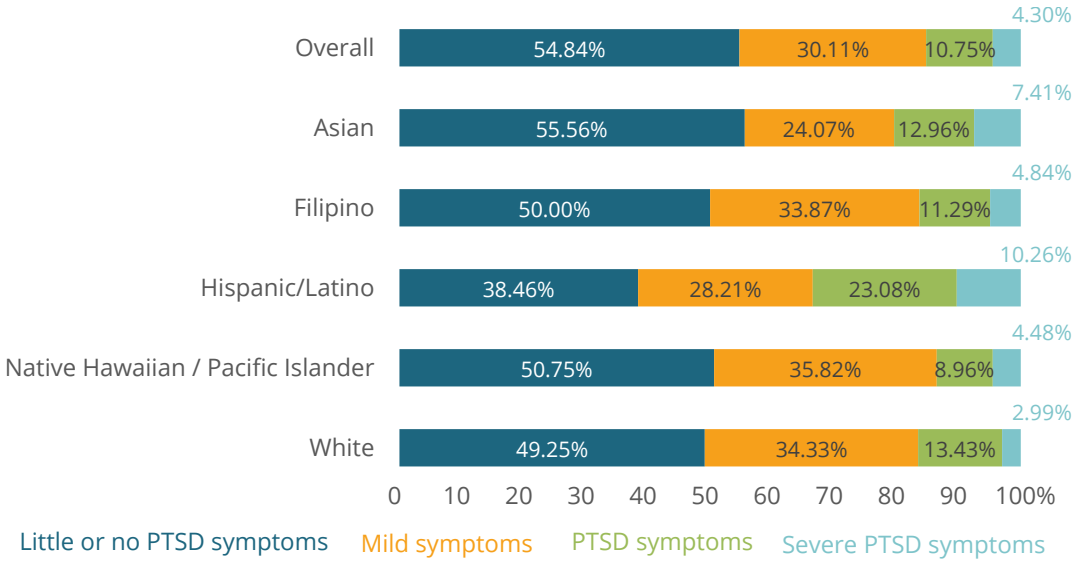


Figure 18. PTSD Symptom Levels (PCL-5)

- 55% report little or no symptoms, 30% report mild symptoms, while 11% meet criteria for PTSD and 4% are in the severe range.
  Why it matters: Nearly half of youth continue to experience trauma-related stress, warranting continued monitoring and care.

Figure 19. PTSD by Gender

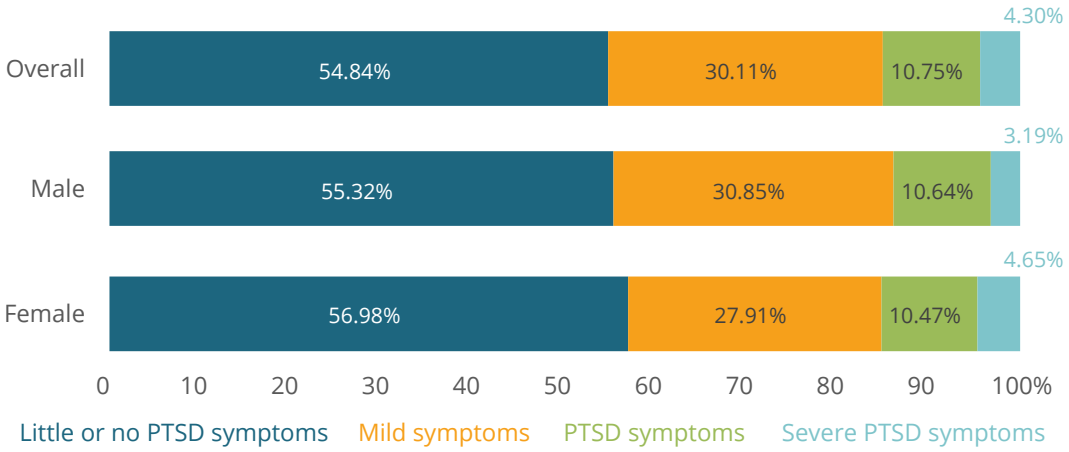


Figure 19. PTSD Symptom Levels by Gender (PCL-5)

- Severe PTSD: 4.7% of females vs. 3.2% of males;
  Mild symptoms: approximately 31% for males and 28% for females
  Why it matters: PTSD symptoms are widespread, with females showing slightly more severe responses. Tailored trauma care should consider gender differences in symptom presentation.

Figure 20. Screen for Child Anxiety Related Emotional Distress Disorders by Race

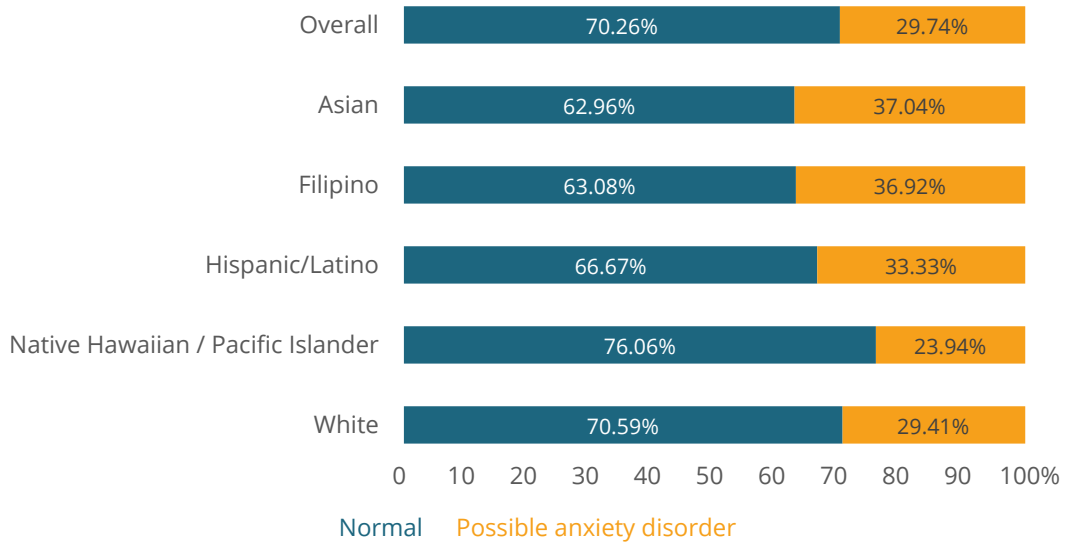


Figure 20. Anxiety Symptoms (SCARED-5)

- 30% of children screen positive for anxiety; 70% do not.
  Why it matters: Anxiety affects nearly one in three children, suggesting a need for ongoing emotional support in schools.

Figure 21. Low Self-esteem by Race

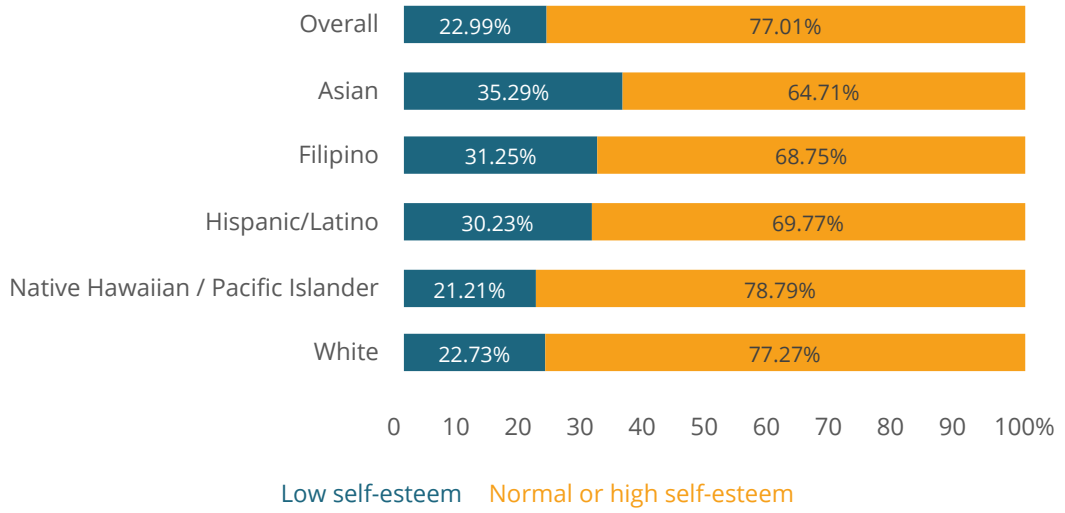


Figure 21. Self-Esteem (Rosenberg Scale)

- 23% of children report low self-esteem; 77% have normal to high levels.
  Why it matters: Low self-worth can hinder recovery and academic performance; early support may build resilience.

Figure 22. Low Self-esteem by Gender

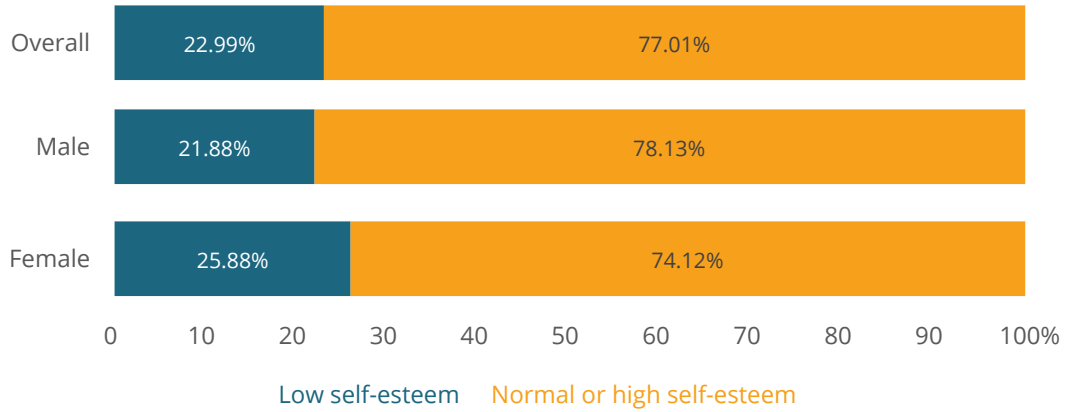


Figure 22. Child Self-Esteem by Gender (Rosenberg Scale)

- Low self-esteem: 26% of females vs. 22% of males
  Why it matters: Female participants exhibit lower self-esteem at higher rates than males, suggesting the need for interventions focused on identity, confidence, and resilience in young girls.

B. Physical Health Snapshot

Nearly two years after the wildfires, health screenings reveal an urgent warning: Maui's children are already showing early signs of heart and lung strain—signals that cannot be ignored. Among the 198 children assessed, nearly 40% now have elevated or hypertensive blood pressure **(Figure 23)**—well above what's expected in healthy youth. Filipino children are the most affected, with 15.4% in Stage 2 hypertension, followed by NH/PI (11.1%) and Hispanic/Latino (8.9%) children **(Figure 23)**. Boys are more likely to fall into the "elevated" or hypertension risk zones then girls **(Figure 24)**.

Lung function paints a similar picture. While 82% still have normal forced vital capacity (FVC), 18% show impaired lung capacity **(Figure 25)**. Severe FVC impairment affects 3.6% of girls and 2.2% of boys **(Figure 26)**. Asian children have the highest rate of severe FVC loss (6%), followed closely by Filipino children—highlighting a need for culturally specific clinical follow-up **(Figure 25)**.

Forced expiratory volume (FEV_1)—a key marker for airway obstruction—raises even greater concern. Fewer than 6 in 10 children (57%) can exhale normally **(Figure 27)**. Another 31% experience mild-to-moderate obstruction, and 13% now show signs of severe blockage. Again, disparities are clear: Asian children have both the lowest rate of normal lung function (50%) and the highest rate of severe obstruction (14%), while girls slightly surpass boys in severe impairment (13.3% vs. 11.8%) **(Figure 28)**.

These findings suggest the need for continued monitoring of cardiovascular and respiratory health in children exposed to wildfire conditions, particularly among certain demographic groups. Regular blood pressure checks, lung function testing, and access to clean indoor air environments may help identify early risks and support long-term health.

Figure 23. Blood Pressure by Race

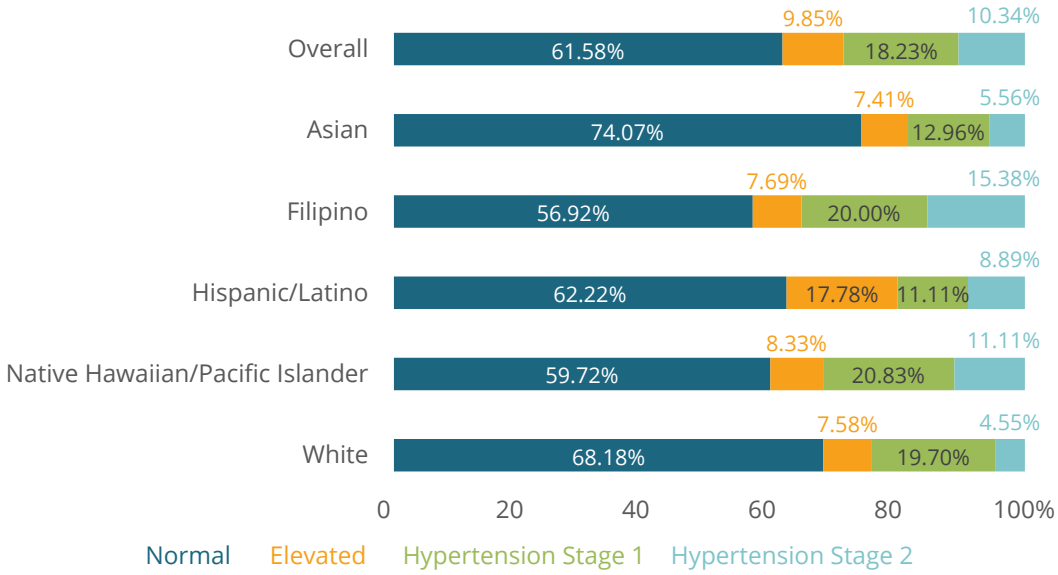


Figure 23. Child Blood Pressure Categories

- 61.6% normal, 9.9% elevated, 18.2% Stage 1 hypertension, 10.3% Stage 2.
  Why it matters: More than 40% of children has abnormal blood pressure, a risk factor for future cardiovascular disease.

- Filipino (15.4%), NH/PI (11.1%), Hispanic/Latino (8.9%), Asian (5.6%), and White (4.6%).
  Why it matters: Filipino, NH/PI, and Hispanic/Latino children are at highest risk, suggesting a need for targeted prevention.

Figure 24. Blood Pressure by Gender

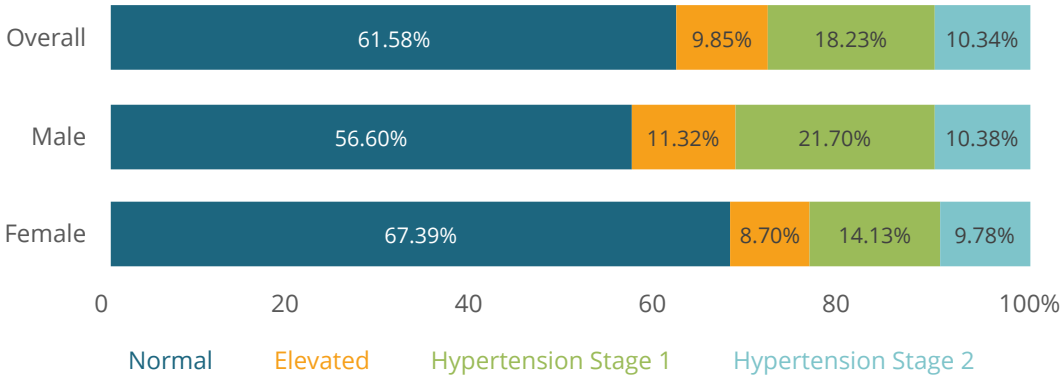


Figure 24. Blood Pressure by Gender

- Male: 56.6% normal, 11.3% elevated, 21.7% Stage 1, 10.4% Stage 2.
  Female: 67.4% normal, 8.7% elevated, 14.1% Stage 1, 9.8% Stage 2.
  Why it matters: Boys show higher early-risk levels; gender-specific health screenings are recommended.

Figure 25. Spirometer Reading: Forced Vital Capacity by Race

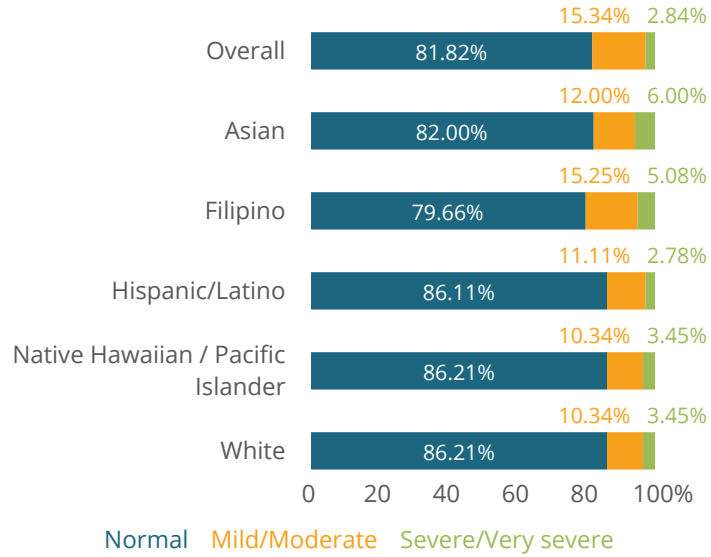


Figure 26. Spirometer Reading: Forced Vital Capacity by Gender

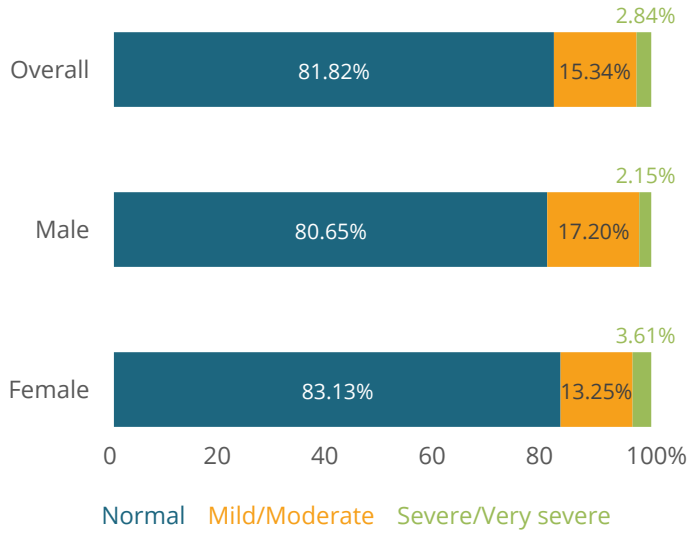


Figure 27. Spirometer Reading: Forced Expiratory Volume by Race

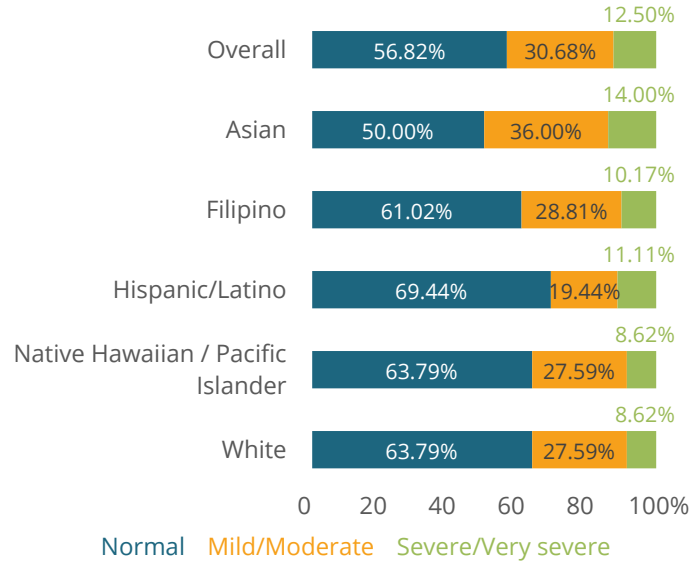


Figure 28. Spirometer Reading: Forced Expiratory Volume by Gender

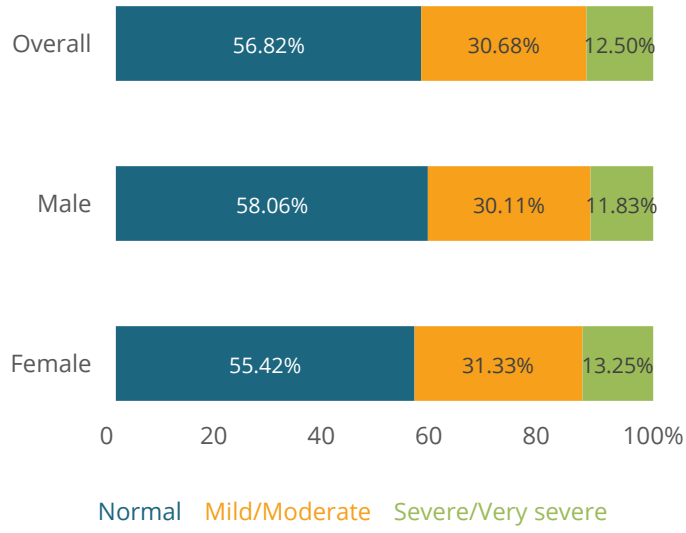


Figure 25. Forced Vital Capacity (FVC) by Race

- 82% normal, 15% mild/moderate loss, 3% severe. Severe impairment: Asian (6%), Filipino (5%), NH/PI and White (3.5%), Hispanic/ Latino (2.8%).
  Why it matters: Some groups show higher lung capacity loss, reinforcing the need for air quality interventions.

Figure 26. FVC by Gender

- Male: 80.7% normal, 17.2% mild/moderate, 2.2% severe.
  Female: 83.1% normal, 13.3% mild/moderate, 3.6% severe.
  Why it matters: Girls show higher rates of severe FVC loss, which could reflect differential environmental or physiological exposure.

Figure 27. Forced Expiratory Volume (FEV1) by Race

- 57% normal, 31% mild/moderate obstruction, 13% severe. Severe: Asian (14%), Filipino (10.2%), Hispanic/ Latino (11.1%).
  Why it matters: Reduced lung function is most common among Asian and Filipino children, signaling a need for targeted pulmonary care.

Figure 28. FEV_1 by Gender

- Boys: 58.1% normal, 30.1% mild/moderate, 11.8% severe.
  Girls: 55.4% normal, 31.3% mild/moderate, 13.3% severe.
  Why it matters: Girls show slightly higher rates of severe obstruction, reinforcing the need for regular lung screening for all children.

C. Summary

When we turned our attention to the full group of 198 children aged 10–17, a clear but unsettling picture emerged: while many young survivors appear outwardly well, large pockets of emotional and physiological risk remain, demanding sustained, child-centred recovery efforts. Nearly one in two children still meet the clinical threshold for depression (severe 22%; mild/moderate 29%) as shown in **Figure 16**, and almost 45 percent report at least mild PTSD symptoms **(Figure 18)**. Anxiety, too, remains elevated, affecting 30% of youth **(Figure 20)**, while 23% struggle with low self-esteem **(Figure 21)**. Girls and children identifying as Asian, Filipino, or Hispanic/Latino consistently carry the heaviest emotional burden, pointing to the need for culturally grounded, gender-sensitive mental-health supports in schools and community hubs.

Physical-health screens reveal parallel concerns. Nearly 40% of children now have elevated or hypertensive blood pressure **(Figure 23)**, with the highest rates among Filipino youth (Stage 2 15.4%) and boys (elevated/hypertensive combined 43.4%) as detailed in **Figures 23 and 24**. Lung tests echo that risk: while 82% retain normal FVC **(Figure 25)**, 18% show restrictive changes—most pronounced in Asian and Filipino children **(Figure 25)**—and 43% exhibit obstructive airflow on FEV_1 **(Figure 27)**, with girls slightly more prone to severe obstruction **(Figure 28)**.

Synthesis. The child cohort data underscore a dual reality: outward resilience coexists with hidden health challenges. Emotional scars—depression, anxiety, PTSD—persist in nearly half the group, while early cardiovascular and respiratory markers flag a risk that can calcify into lifelong illness if left unchecked. In response, Maui's recovery must extend beyond bricks-and-mortar to include:

- School-based mental-health teams staffed by trauma-informed counselors and cultural navigators, ensuring that girls and ethnically at-risk youth receive timely support.
- Routine pediatric screening for blood pressure and lung function, coupled with on-site inhaler stations and clean-air classroom initiatives to catch and reverse early cardiopulmonary damage.
- Community-led peer-support programs and family-strengthening activities that rebuild self-esteem.

By pairing these targeted interventions with the broader adult recovery strategy, Maui can protect its youngest survivors from carrying the disaster's toll into adulthood—and transform children's hidden vulnerabilities into sources of renewed strength.

III. From Crisis to Course Correction

Changes Over Time

Nineteen months after flames swept Lahaina and Kula, over 400 adults who first enrolled six-to-nine months post-fire returned for a second check-up as of May 2025. Comparing their Year-1 and Year-2 data gives us something rare in disaster research: a before-and-after look at the same people. The story that emerges is one of measured progress—but also of stubborn, slow-moving challenges. This section follows the same 424 adults at two moments in time: Year 1 (6–9 months after the fires) and Year 2 (18–21 months post-fire). Their trajectories reveal where recovery is gaining ground—and where it is stalling. Narrative findings below reference **Figures 29 – 42**.

A. How people feel overall

When the cohort first enrolled, nearly half felt physically worse than in the year before the fires. By the second visit the share reporting decline had fallen by twelve percentage points, and the "better" group more than doubled **(Figure 29)**.

Figure 29. Compared to one year ago, how would you rate your health in general now?

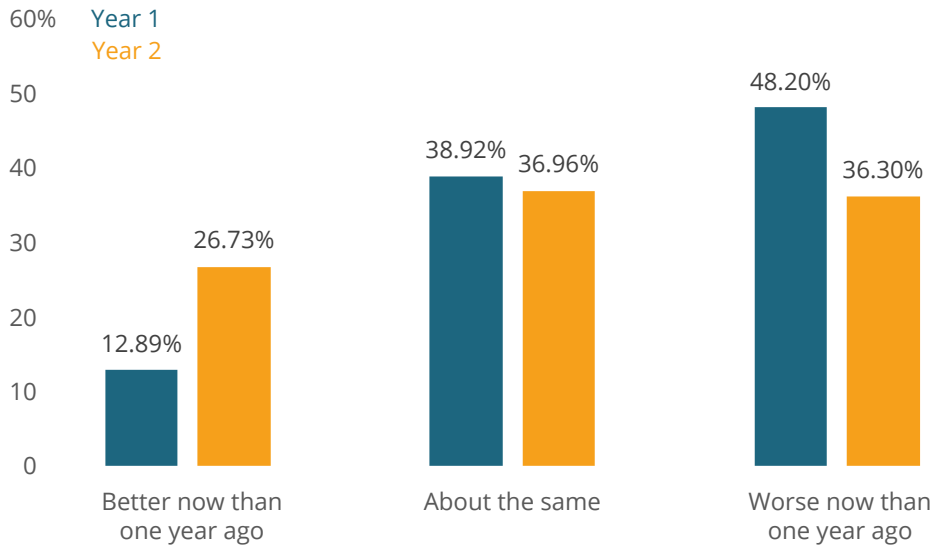


Figure 29. Self-Rated Health (Year 1 vs. Year 2)

- Participants reporting improved health more than doubled—from 13% to 27%, while those saying their health worsened dropped from 48% to 36%.
  Why it matters: These shifts show uneven but meaningful signs of recovery, even as many still struggle.

B. Mood, anxiety, and self-worth

Mental health challenges remain a major concern nearly two years after the wildfires. In the follow-up group, 53% of adults continue to experience some level of depressive symptoms, with 7.5% showing severe depression. Anxiety remains elevated: while severe anxiety declined slightly to 11%, 31% reported mild and 12% moderate anxiety, far above pre-fire levels. PTSD symptoms are also widespread—over 66% of participants reported at least mild trauma, including 8% with severe symptoms. Suicidal ideation dropped from 3.1% in Year 1 to 1.9% in Year 2 but remains more than double the baseline rate. Low self-esteem, another key indicator of emotional strain, affected 19% of participants, up from 15% pre-fire. These findings highlight the need for continued access to trauma-informed mental health services and community-based emotional support **(Figures 30-34)**.

Figure 30. Depression

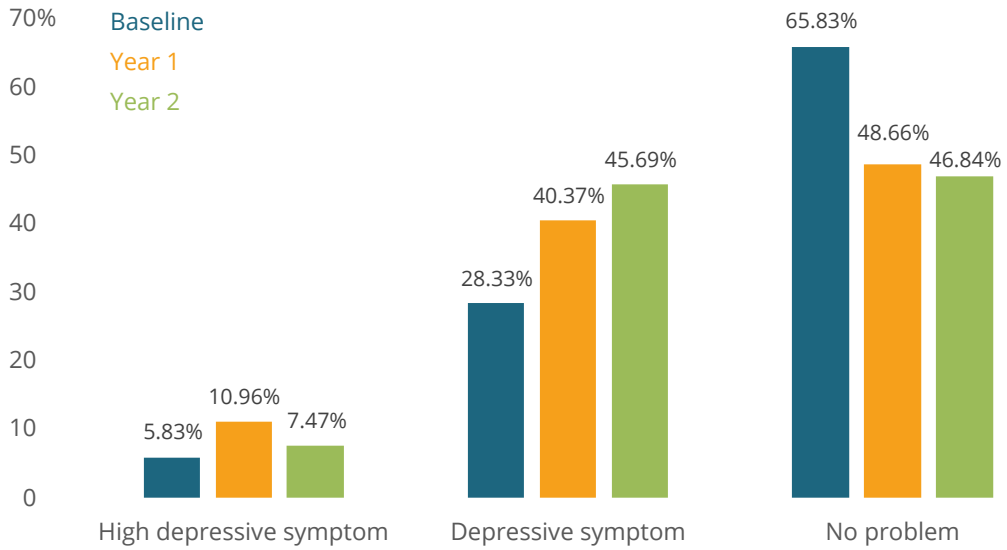


Figure 30. Depression Severity Over Time

- The percentage with severe depression dropped from 10.9% to 7.5%, but moderate depression rose from 40% to 46%.
  Why it matters: While the most intense cases are improving, many still carry a heavy emotional burden.

Figure 31. Anxiety

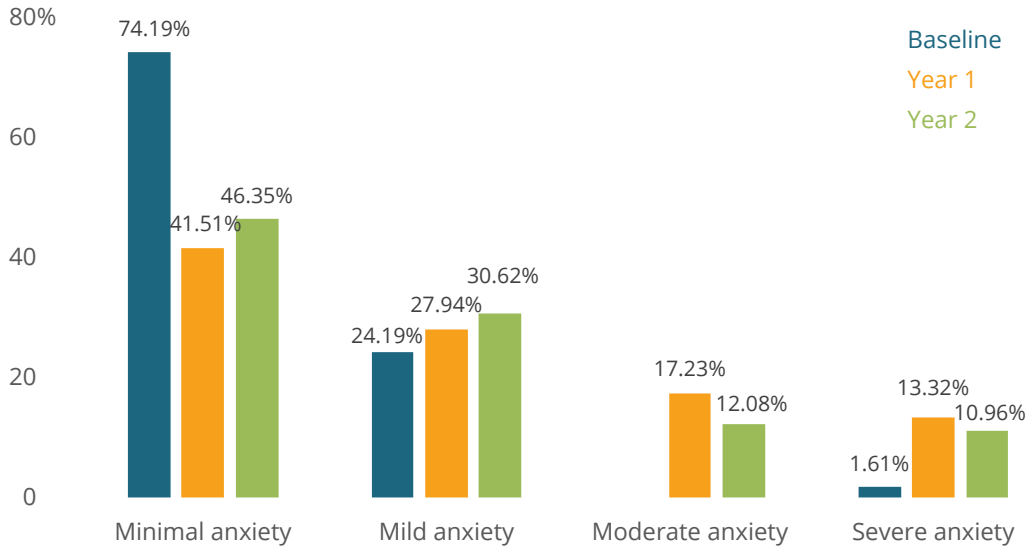


Figure 31. Anxiety Levels Over Time

- Severe anxiety declined slightly from 13.3% to 11%, yet remains nearly 10 times higher than pre-fire levels.
  Why it matters: Anxiety is still widespread and well above baseline, requiring continued mental health support.

Figure 32. Post-Traumatic Stress Disorder (PTSD)

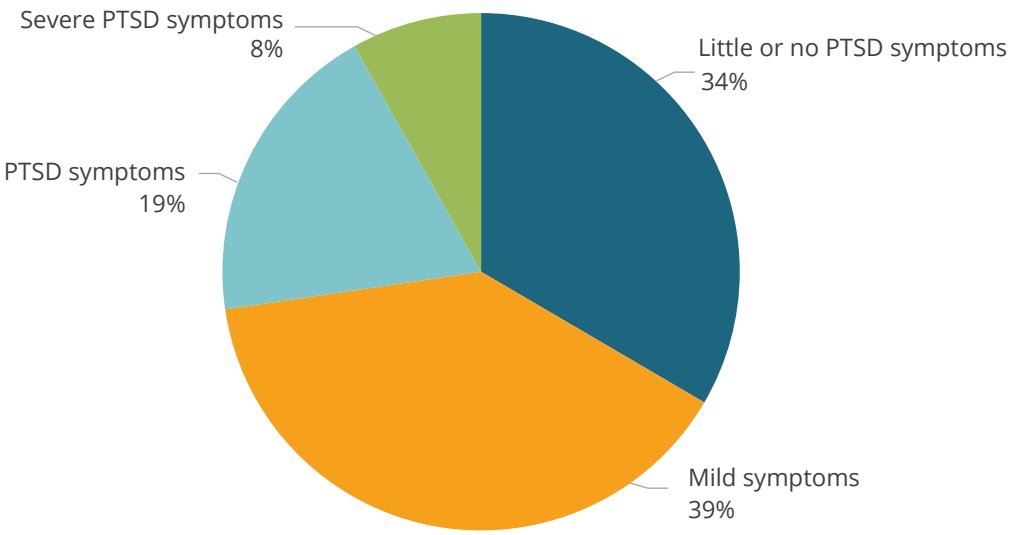


Figure 32. PTSD Symptoms (Year 2)

- Only 34% of participants reported little or no symptoms; 67% showed at least mild PTSD, including 19% with PTSD and 8% with severe symptoms.
  Why it matters: Two-thirds of residents are still carrying psychological trauma from the disaster.

Figure 33. Suicidal Ideation

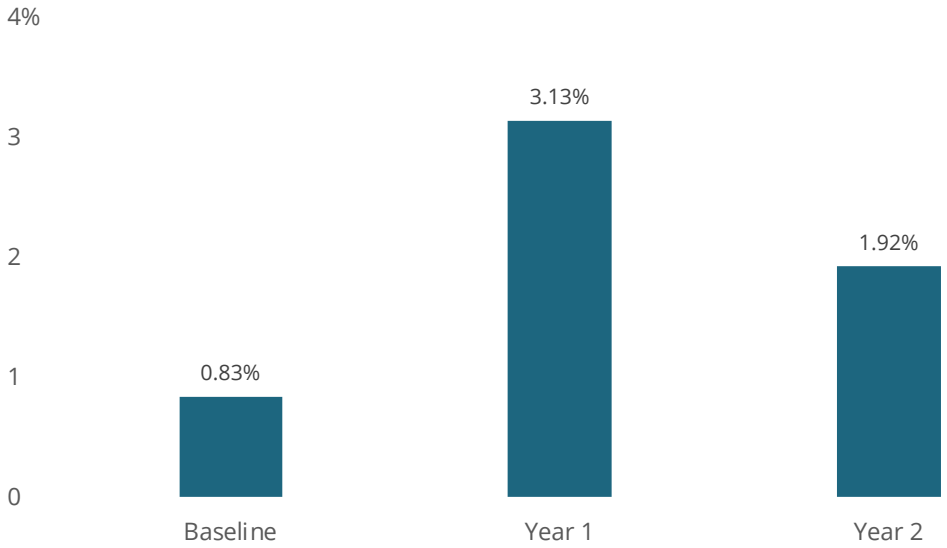


Figure 33. Suicidal Ideation (Baseline to Year 2)

- Rates spiked from 0.8% pre-fire to 3.1% in Year 1, then dropped to 1.9% in Year 2.
  Why it matters: Suicidal thoughts have decreased but remain more than double pre-fire levels, reinforcing the need for continued screening.

Figure 34. Low Self-Esteem

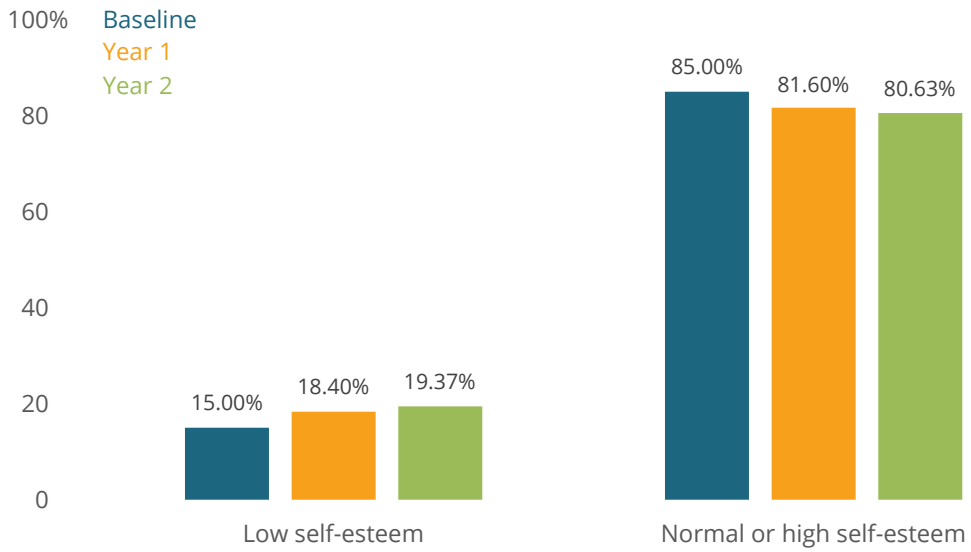


Figure 34. Low Self-Esteem Over Time

- The percentage of participants with low self-esteem rose from 15% pre-fire to 18.4% in Year 1, and 19.4% in Year 2.
  Why it matters: Ongoing displacement and uncertainty are eroding confidence and self-worth, particularly in younger and job-seeking groups.

C. Cardiopulmonary warning signs

Heart and lung health has been slightly improved. Both the early-stage (Stage 1) hypertension and Stage 2 hypertension slightly decreased (from 41.9% to 39.7%, and from 22.02% to 20.3%, respectively). The rate of normal blood pressure steadily increased- from 25.7% to 29.3% **(Figure 35)**. On the other hand, lung function is following a different concerning trend. The share of participants with normal forced vital capacity (FVC) fell by 9 percentage points, and those with normal FEV_1 (a key measure of airflow) dropped by 22 points. At the same time, the rate of severe airflow obstruction more than doubled, increasing from 6% to 14.6%. These silent but serious changes point to an elevated risk of future strokes, heart attacks, and chronic lung disease unless access to long-term clinical care expands significantly. **(Figures 36-37)**.

Figure 35. Blood Pressure

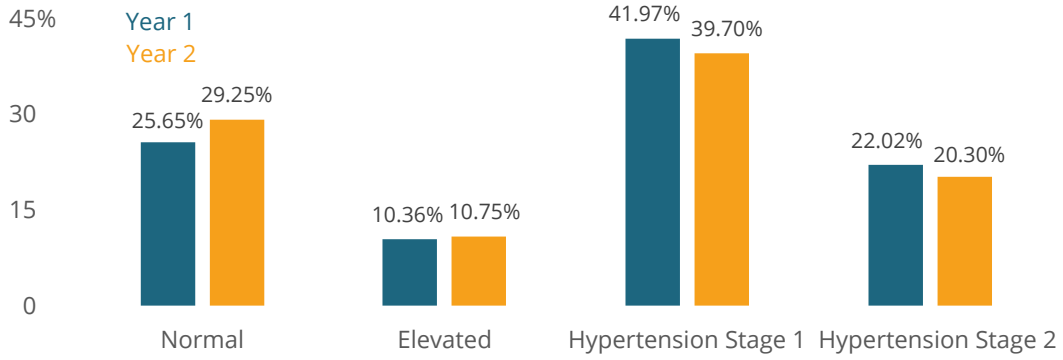


Figure 35. Blood Pressure Status

- Stage 2 hypertension increased from 24% to 33%, signaling more people entering a high-risk category for stroke and heart disease.
  Why it matters: Rising blood pressure is a warning sign that chronic health conditions are worsening without intervention.

Figure 36. Spirometer Reading; Forced Vital Capacity

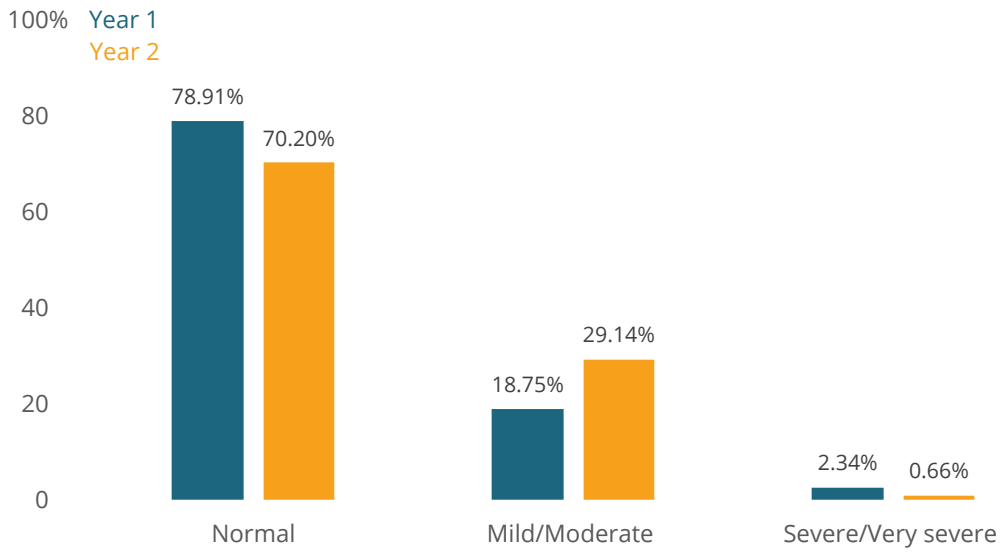


Figure 36. Forced Vital Capacity (FVC)

- The percentage of participants with normal lung volume dropped from 79% to 70%.
  Why it matters: This suggests long-term lung inflammation or restriction, likely tied to wildfire smoke exposure.

Figure 37. Spirometer Reading; Forced Expiratory Volume

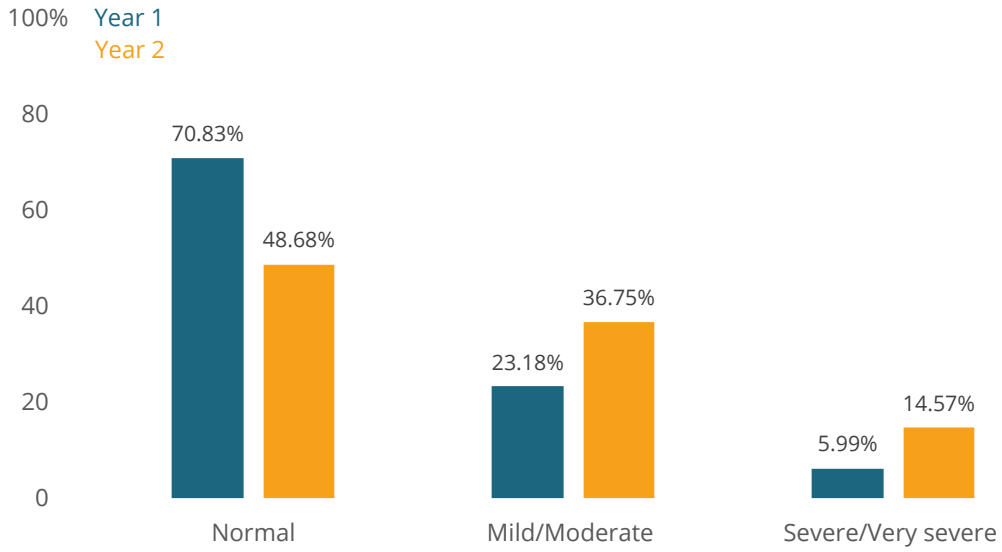


Figure 37. Forced Expiratory Volume (FEV_1)

- Normal FEV_1 scores dropped sharply from 71% to 49%, and severe obstruction rates doubled.
  Why it matters: Obstructed breathing is becoming more common, highlighting the need for respiratory care and inhalers.

D. Housing, food, and access to care

Housing instability remains one of the most persistent challenges nearly two years after the fires. In Year 2, 47.7% of participants reported living in temporary housing—an improvement from 55.4% in Year 1, but still far above the 3.7% pre-fire baseline. While the percentage of people who feel secure in their current housing increased from 68.1% in Year 1 to 75.8% in Year 2, this remains below the 79.0% reported before the fires. These numbers reflect slow but measurable progress, and highlight the continued need for stable, affordable housing to support long-term recovery **(Figures 38 and 39)**.

Food insecurity has increased over time. In Year 2, only 56.6% of participants said they had no food insecurity—down from 66.2% in Year 1 and 77.2% before the disaster. At the same time, those reporting low food security rose to 21.2%, and very low food security climbed to 22.2%—more than double the pre-fire rate of 10.5% **(Figure 40)**. This troubling trend suggests that many households are not only facing economic stress but are also struggling to meet basic nutritional needs, calling for expanded food assistance and community-based support programs.

Despite ongoing challenges, Maui's strong sense of community continues to be a source of resilience. In Year 2, 53.0% of participants reported high levels of perceived social support, slightly down from 60.4% in Year 1. Moderate support held steady at 32.3%, while those with low support rose to 14.7%. Although overall support remains relatively strong, the decline in high support is a reminder that continued displacement, stress, and isolation can wear down even the tightest-knit communities. Investing in relationship-based outreach, peer support, and cultural anchors will be critical to sustaining resilience **(Figure 42)**.

Overall, the paired data tell a nuanced and evolving story. While some of the most acute psychological distress—such as suicidal ideation and severe depression—has begun to ease, physical health problems and social stressors remain deeply entrenched. Reduced lung function, food insecurity, and housing instability continue to affect large segments of the population. These lingering issues are not isolated—they are interconnected, compounding stress and slowing the healing process. Recovery is clearly underway, but it is fragile. Long-term progress will depend not just on immediate relief, but on lasting structural support: permanent housing for displaced families, expanded access to affordable and nutritious food, and continued delivery of trauma-informed care through trusted, culturally grounded health systems. Without these pillars, the risk of long-term health deterioration and deepening inequality will remain. The MauiWES findings underscore the importance of sustained, community-led investment to ensure that recovery reaches every household—and that healing is not only possible, but permanent.

Figure 38. Are you currently living in temporary housing?

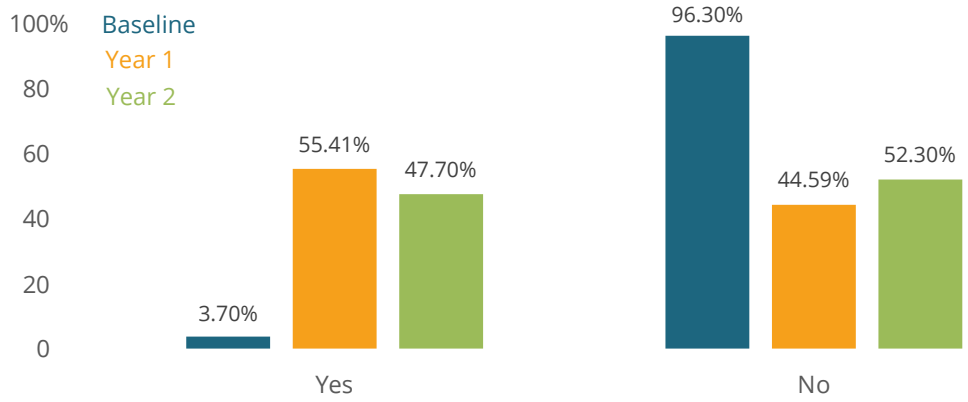


Figure 38. Living in Temporary Housing

- The share of participants in temporary housing fell slightly from 55% to 48%.
  Why it matters: Nearly half the community is still displaced, making housing recovery one of the most urgent needs.

Figure 39. Do you feel secure in your current housing situation?

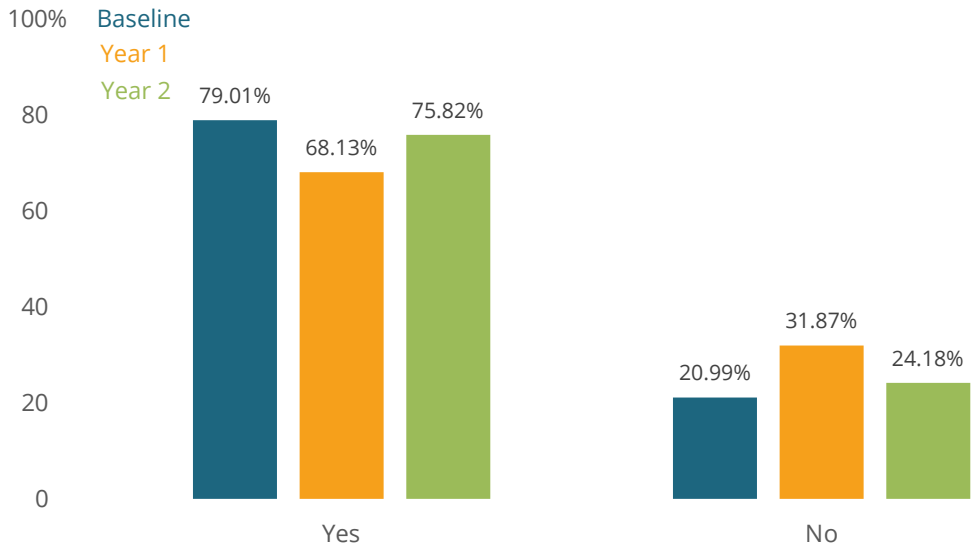


Figure 39. Housing Security

- Those who felt secure in their housing rose from 68% to 76%, still below the pre-fire rate of 79%.
  Why it matters: Housing uncertainty remains a key stressor for many families.

Figure 40. Food Insecurity

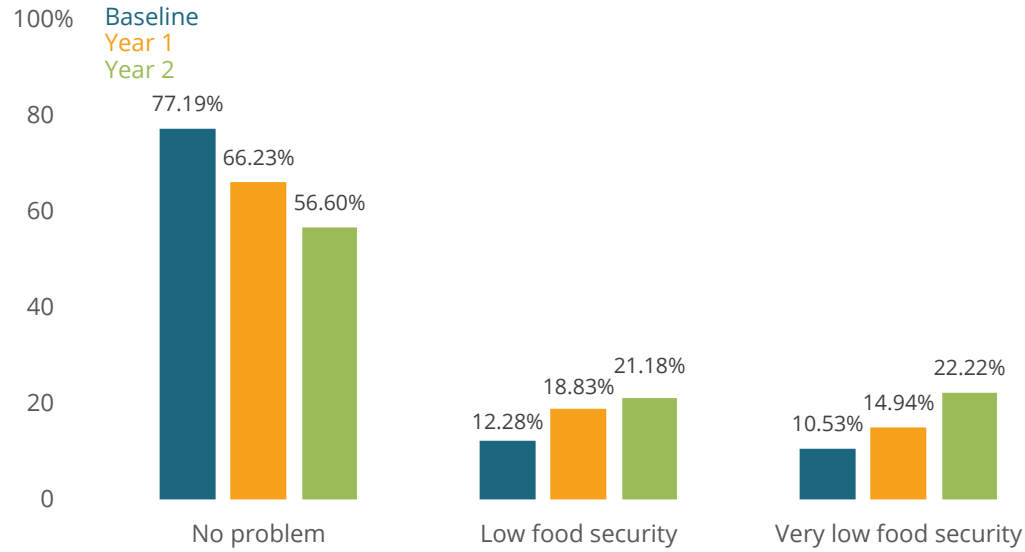


Figure 40. Food Security Trend

- Very low food security more than doubled, from 10.5% to 22.2%, and only 56.6% reported no food problems.
  Why it matters: More people are skipping meals or going hungry—indicating rising hardship and the need for continued food aid.

Figure 41. Do you currently have health insurance?

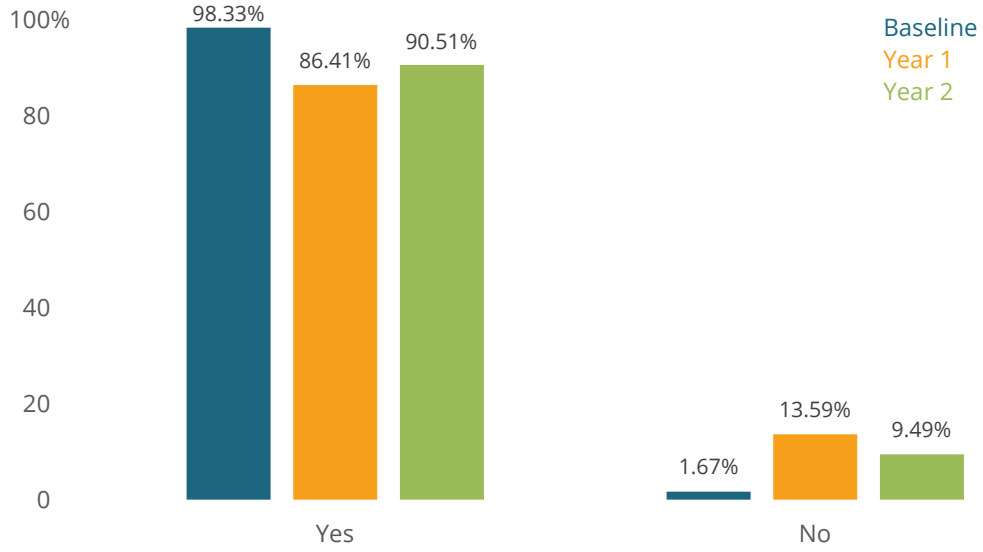


Figure 41. Insurance Coverage

- Insurance coverage increased from 86% to 91%, largely thanks to outreach programs and charitable support.
  Why it matters: Major progress has been made, but 1 in 10 adults remain uninsured.

Figure 42. Multidimensional Scale of Perceived Social Support

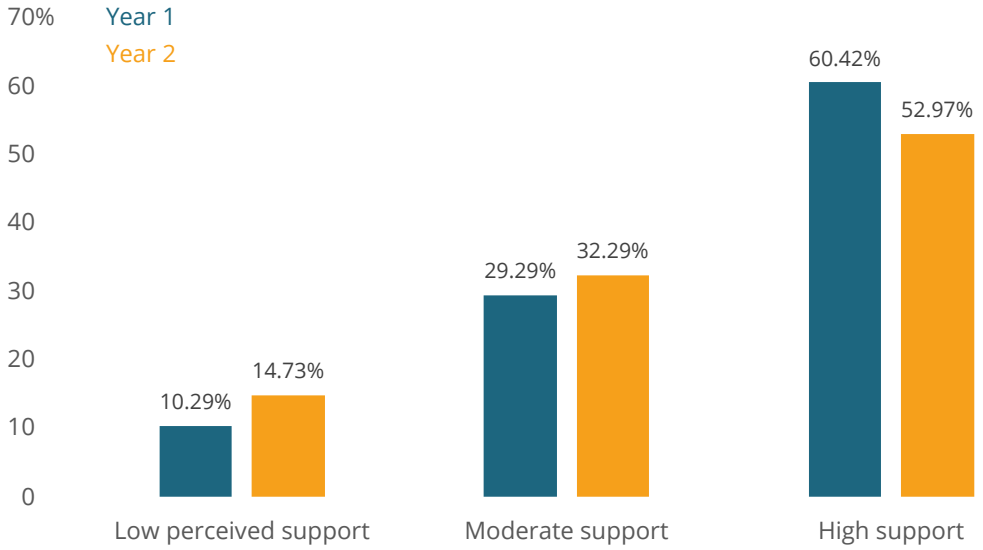


Figure 42. Social Support

- High levels of perceived social support declined from 60.4% to 53%, while reports of low support rose from 10.3% to 14.7%.
  Why it matters: 'Ohana and community networks remain strong, but fatigue is setting in—highlighting the need for formal peer support and caregiver relief.

E. Summary

The Year 2 data tell a story of progress mixed with persistent gaps. Housing has improved modestly—temporary housing rates dropped from 55% to 48%, and perceived housing security rose by 8 points—but half of participants are still without permanent homes, and overall housing stability remains below pre-fire levels. Insurance coverage has rebounded impressively to 90%, thanks to coordinated outreach and support programs.

Food insecurity has worsened significantly. Very low food security has doubled to 22%, indicating that nearly one in four adults are now skipping meals or going without food for entire days. This growing crisis threatens to undo health gains, particularly in blood pressure and mental health. At the same time, community support—the island's strongest protective factor—has started to decline. The share of residents reporting high social support fell from 60% to 53%, a drop closely linked to higher rates of depression and uncontrolled hypertension.

Together, these trends emphasize that recovery is not just about individual fixes—it demands a connected response. Lasting progress will require long-term, coordinated investments that integrate housing, food access, healthcare capacity, and peer support into a unified system. Only by addressing these needs together can Maui's recovery truly restore both stability and well-being.

Synthesis. These interconnected trends—housing half-fixed, insurance partly restored, food stress worsening, support networks fraying—underscore a simple truth: recovery requires coordinated investment across sectors, with health care at the center. A roof without access to affordable groceries or a health insurance card without nearby clinics or pharmacies leaves critical needs unmet. The data make clear that long-term recovery will depend on strengthening Maui's health infrastructure—expanding clinic capacity, supporting culturally rooted care, and ensuring mental and physical health services reach those most in need. Lasting progress will require a unified recovery system that weaves together permanent housing, food assistance, health access, and peer support to restore both well-being and stability.

IV. Description of Survey Respondents and Methodology

The MauiWES cohort mirrors the island's vibrant diversity while highlighting key groups most impacted by the fires. Age distribution skews toward working-age adults: 24% are 18–34 years old, 60% are 35–64 years old, and 16% are 65 and older **(Figure 43)**. This concentration of middle-aged residents—many juggling jobs, mortgage or rent payments, and caregiving—helps explain the high rates of depression and chronic-disease risk we observe.

Ethnically, 30% identify as White, 20% as Native Hawaiian or other Pacific Islander, 19% as Filipino, 18% as Hispanic/Latino, 9% as non-Filipino Asian, and 4% as multi-racial or other **(Figure 44)**. Notably, the study successfully reached nearly one-fifth Hispanic/Latino participants, a group often under-represented in health research, ensuring our findings speak to the full spectrum of Maui's communities.

Women make up 61% of participants and men 39% **(Figure 45)**, reflecting both men's higher workforce mobility post-disaster and women's central role in family health decisions and community engagement.

Regarding educational attainment of the participants, 14% of the group possesses less than a high-school diploma, 28% possess a high-school diploma, and 29% holds a bachelor's degree or higher. The remainder of the participants have completed some college or vocational training **(Figure 46)**. Education shapes health literacy and access to resources—factors that influence how families navigate insurance, medical care, and mental-health supports.

Economic measures reveal that 30% of the cohort lives below the federal poverty line, and another 30% falls within 100–200% of that threshold; only 40% enjoy incomes at above twice the poverty line **(Figure 47)**. Such financial strain is tightly linked to housing instability, food insecurity, and barriers to medical care, all of which influence the health outcomes presented earlier.

Finally, household composition varies widely: a quarter of participants report living in a household of two people, 18% live in the household of four people **(Figure 48)**. Approximately 57% of participants report no children under 18 at home, 32% have one or two children, and 11% have three or more **(Figure 49)**. Families raising multiple children face unique recovery hurdles—from remote schooling challenges to increased caregiving stress—underscoring the need for targeted support in childcare, education continuity, and youth mental-health programs.

Figure 43. Age

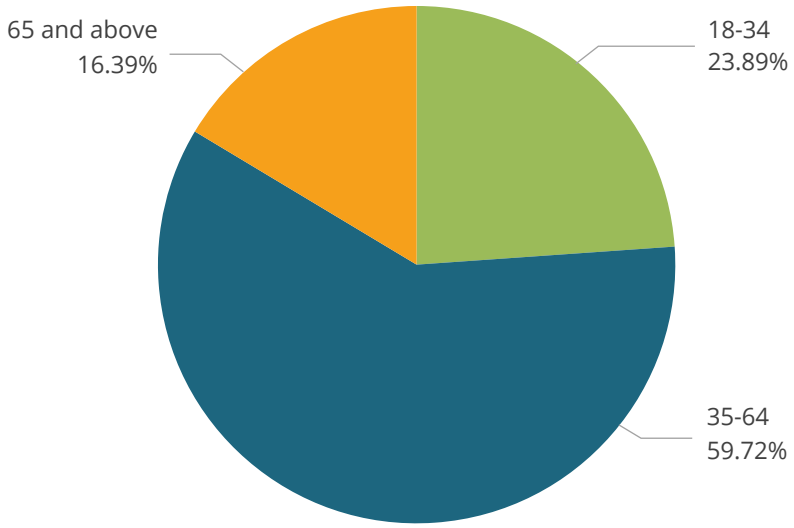


Figure 44. Race

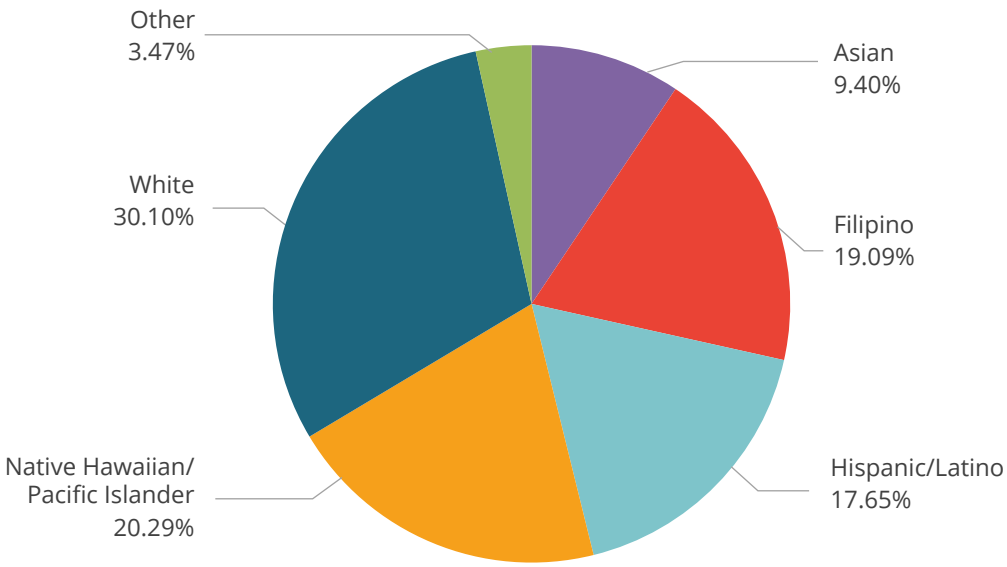


Figure 45. Gender

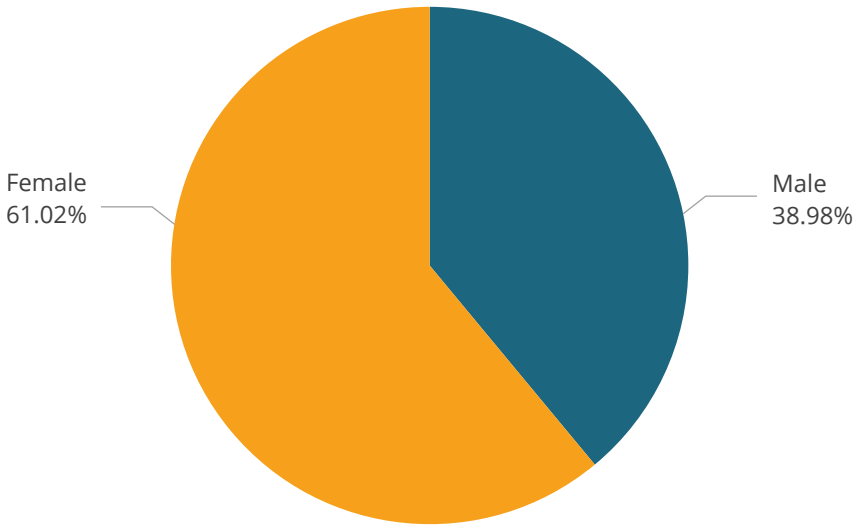


Figure 46. Education

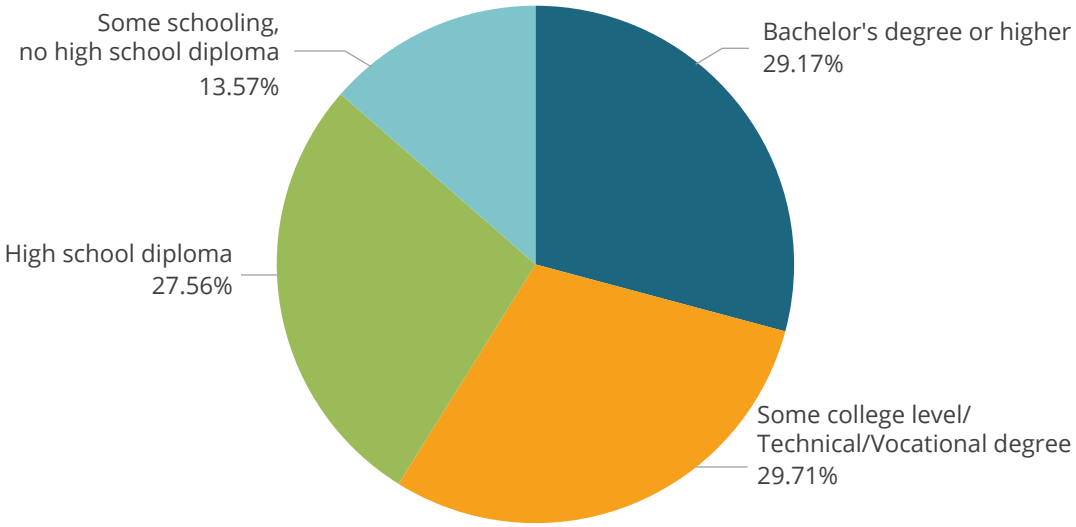


Figure 47. Relation to Poverty Line

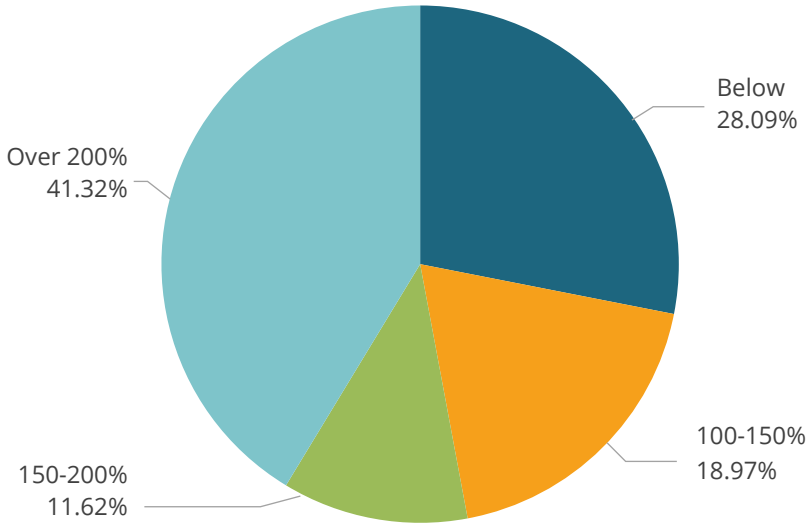


Figure 48. How many people are currently living in your household including yourself?

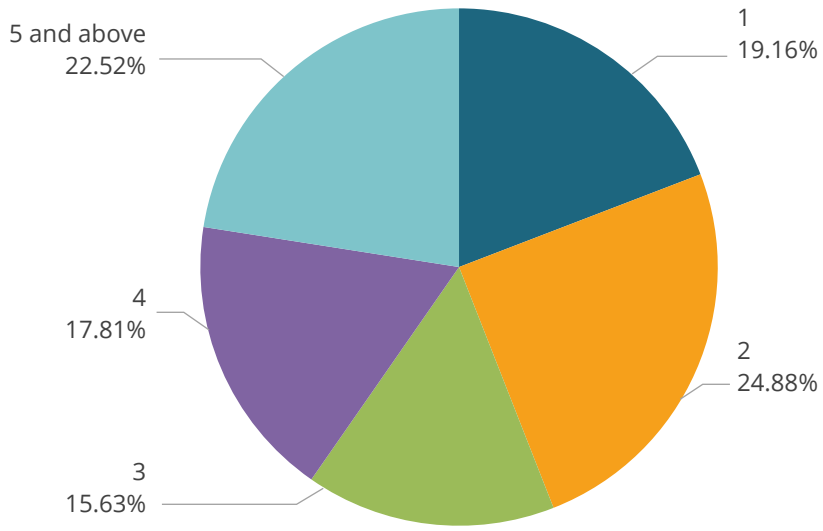
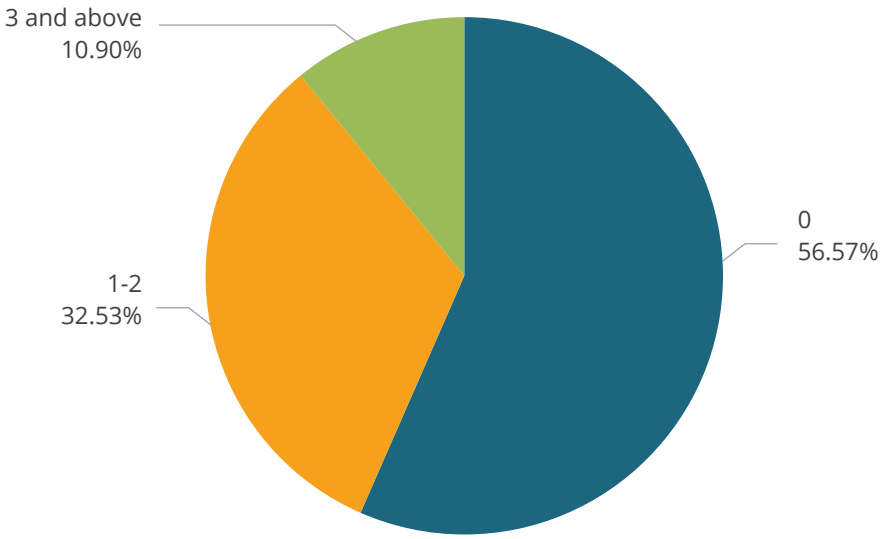


Figure 49. How many children (under 18 years old) are in your household?



Limitations

While the MauiWES offers one of the most comprehensive snapshots of post-wildfire health in Hawai'i, several limitations must guide how these findings are interpreted and applied:

1. **Convenience sampling**. Participation depended on residents attending pop-up events, which may over-represent those with time, transportation, or trust in formal research efforts. Homebound individuals, those still off-island, or residents in deeply isolated areas are likely under-captured, limiting the generalizability of results to every fire-affected Maui resident.

2. **Self-report bias**. Survey instruments—covering mental health, exposure frequency, housing status, and food security—rely on participants' recollection and willingness to share sensitive information. Recall errors and social-desirability bias may lead to under-reporting of stigmatized experiences, such as suicidal ideation or financial hardship.

3. **Cross-sectional comparisons**. Although the returning adult cohort (n = 424) provides rare longitudinal data, most analyses compare separate snapshots (Year 1 vs Year 2; full cohort vs pre-fire UHERO benchmarks). Cohort attrition—participants lost to follow-up—could skew year-over-year trends if those who moved or declined re-enrollment differ systematically in health or exposure.

4. **Benchmark differences**. UHERO Rapid Survey participants, used as pre-fire comparison groups, differ demographically—often higher in education or income—than our convenience cohort. These structural differences can exaggerate or mask true wildfire effects, requiring cautious interpretation when stating "× times higher than baseline."

5. **Confounding environmental factors**. Smoke exposure varied by location and season, and subsequent events (vog from Kīlauea, supply-chain disruptions) may also influence respiratory and mental-health outcomes. Isolating wildfire-specific impacts remains challenging without continuous environmental monitoring.

6. **Measurement limitations**. Point-of-care devices (i-STAT, EasyOne Air) deliver rapid, community-friendly results but have greater margins of error than laboratory-grade equipment. Similarly, single blood-pressure or spirometry readings provide screening-level data; confirmatory clinical testing is needed to diagnose chronic conditions.

We included all EasyOne Air scores, regardless of quality, which may introduce measurement error and reduce the reliability of lung function estimates; however, the dashboard provides the most recent available values, with some metrics broken down by quality score. Despite these constraints, MauiWES's blended approach—community-rooted recruitment, rapid field diagnostics, validated questionnaires, and a growing biobank—provides unparalleled, actionable insights. As the study and its public dashboard evolve, these limitations will inform more nuanced analyses and guide targeted strategies to accelerate Maui's journey from crisis to sustained recovery.

Conclusions

Two years after the fires, the Maui Wildfire Exposure Study offers a grounded picture of recovery—one defined by resilience, but tempered by enduring risk. On the positive side, more residents are reporting better self-rated health, insurance coverage has improved, and strong social ties continue to anchor the community. Yet alongside these gains, the data reveal pressing challenges: elevated rates of depression, anxiety, PTSD, hypertension, and impaired lung function remain widespread. Food insecurity and unstable housing continue to affect thousands, and one in three adults still struggles to access timely medical care.

Equally concerning, children are showing early signs of emotional distress and cardiopulmonary strain—signals that could deepen into chronic conditions without early intervention. These trends cannot be addressed in isolation. They require long-term investments, not just in infrastructure, but in human well-being.

This comprehensive dataset affirms a critical truth: disaster recovery is not a short-term fix but a multi-year journey requiring coordinated, community-led action.

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It is important to note that the opinions and findings presented in this report are solely those of the authors and do not necessarily reflect the views of our funders, our community partners and Scientific and Community advisory boards.

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