HARC
HEALTH ASSESSMENT AND RESEARCH FOR COMMUNITIES

2023

Special Report

ENVIRONMENTAL HEALTH IN THE COACHELLA VALLEY

THIS REPORT WAS MADE POSSIBLE BY A GRANT FROM THE WINDWARD FUND

WINDWARD Fund

Table of Contents

Acknowledgements 3
Executive Summary 4
Introduction 4
Results 5
Demographics 5
Environment Perceptions 5
Regional and Demographic Comparisons 6
Air Quality Comparisons 7
Environmental Concerns and Opinions of Residents 7
Conclusion 8
Introduction 10
About HARC 10
The Coachella Valley Community Health Survey 10
This Report on Environmental Justice 11
Coachella Valley Geography 12
Methods 13
Data Collection 13
Data Weighting 13
Understanding the Data 14
Community Interviews 14
Results 16
Demographics 17
Age 17
Gender 17
Race/Ethnicity 18
Income and Poverty 19
Educational Attainment 20
Environment Perceptions 21
Perceptions of Air Quality In The Neighborhood 21
Willingness to Change Lifestyle 22
Outdoor Activities Inhibited by Poor Air Quality 23
Regional and Demographic Comparisons 24

Air Quality 24
Outdoor Activities Inhibited by Poor Air Quality 32
Willingness to Change Lifestyle 40
Air Quality Comparisons 47
General Health 47
Racism 48
Major Diseases 48
Safe Place to Walk, Bike, or Hike in Neighborhood 50
Food Insecurity 50
Healthcare Access 51
COVID-19 52
Environmental Opinions and Concerns of Residents 54
Environmental Health Concerns 54
Access to Outdoor Recreation 57
Climate Change 59
Observed Changes Over Time 61
Conclusion 63
Appendix 65
English-Language Interview Guide 65
Spanish-Language Interview Guide 68

Acknowledgements

This special report was made possible by the Windward Fund, with a grant from the Environmental Justice Data Fund. The Winward Fund "seeks to build a more impactful environmental movement by connecting people across diverse geographies, sectors, and communities, enabling them to share expertise and resources, and providing a vehicle for effective, community-based, grassroots grant making that elevates the voices of those most impacted by environmental degradation." This grant made possible the survey data analyses, the collection and analyses of interview data, and the collaboration of the Community Advisory Board (Advisory Board).

HARC staff who contributed to the report are as follows, listed in alphabetical order by last name: Jenna LeComte-Hinely (data analysis), Chris Morin (data analysis, report writing, and Advisory Board coordination), Cassaundra Leier (supervision and support), Bernardo Lino (conducting interviews, report writing, report translation, and Advisory Board coordination), and Daniel Polk (conducting interviews, report writing, report translation, and Advisory Board coordination). We are grateful to HARC's administrative staff, Theresa Sama and Nicole Smith, for their administrative management. We are also grateful to HARC interns Xitlaly Lopez (report translation) and Rebecca Steiner (report writing).

HARC staff contacted our existing community partners to identify and invite individuals interested in serving on the Advisory Board. We sought individuals with diverse experience, including those from academia, healthcare, government, social justice advocacy, and conservation. This experience included those from organizations such as the University of California, Riverside (UCR), Palm Desert Campus; UCR Department of Environmental Sciences; UCR School of Medicine; Planned Parenthood; South Coast Air Quality Management District; the Office of Congressman Dr. Raul Ruiz; Alianza Coachella Valley; the Cactus-to-Clouds Institute; and COFEM (Consejo de Federaciones Mexicanas).

We are also grateful to the following who helped us recruit several Advisory Board members: Alfonso Gonzales Toribio, Professor of Ethnic Studies and Director of the UCR Latino and Latin American Studies Research Center; Jenifer Lopez-Valdez, Outdoor Education Manager, The Wildlands Conservancy; and Sam Ying, Professor of Environmental Sciences and faculty advisor for the UCR Latinxs & the Environment initiative.

We are grateful for the time and invaluable input offered by the 13 members of the Advisory Board, listed below in alphabetical order by last name:

Colin Barrows
Arlene Farol
Sienna Thomas
Simmi Tomar
Shayra Hernandez
Sendy Hernández Orellana Barrows
Simon Moore
Desiree Morales
Ernesto Ocegueda
Gabriela Ortiz
Aydee Palomino
Conchita Pozar
Alyssa Valdez

We also thank Alexis Galarza of the Desert Recreation District for his and his team's help in providing a space for the two focus groups.

We are also grateful for all the Coachella Valley community members who took the 2022 Community Health Survey and who participated in the interviews and focus groups.

Executive Summary

Introduction

The data collected across the Coachella Valley in HARC's triannual Community Health Survey allows HARC to closely examine population characteristics. For this report, the focus is on environmental perceptions such as those regarding neighborhood air quality, inability to engage in outdoor activities due to poor air quality, and willingness to change lifestyles for the sake of the environment.

This report includes the environmental survey questions (neighborhood air quality, limiting outdoor activities, and willingness to change) newly added in the 2022 survey, along with detailed advanced analyses such as how responses to these questions may statistically vary based on region (Eastern compared to Western Coachella Valley), demographics (gender, age, poverty status, etc.), and other characteristics such as general health status, food insecurity, and healthcare access.

These questions are compared against regional and demographic information. Other comparisons based on other characteristics, such as general health status, food insecurity, and healthcare access, are provided if the findings are statistically significant (described further in the methods section).

In addition to the survey data, this report also draws on qualitative findings from a series of interviews and focus groups. To help recruit interviewees and focus group participants, as well as to provide feedback on this report, a Community Advisory Board was convened. With the Advisory Board's help, 24 participants were recruited to offer their views on local environmental pollution, outdoor activity, and environmental health.

Methods

HARC conducted address-based mailing using paper surveys for the Community Health Survey. With this method, residents received an envelope in the mail which included a letter (in English and Spanish) that described the survey, an English-language survey, a Spanish-language survey, a prepaid pre-addressed envelope, and a $2 bill "pre-incentive" that was theirs to keep regardless of their participation. Data collection spanned from April 2022 to August 2022, with 2,447 adults completing the survey.

Once data collection was complete, the data was weighted by a statistician to the five-year (2016-2020) Census population estimates of the Coachella Valley (nine incorporated cities in the Coachella Valley combined with the 12 census-designated places) to most accurately represent the entire population living here. Weighting the data is essential to ensure that the 2,447 surveyed adults represent the approximately 350,000+ adults living in the Coachella Valley. As such, the weighted percentages and population estimates presented in the report represent estimates that are weighted from the 2,477 respondents to the 350,000+ adults of the region.

This special report also included a series of community interviews to explore topics such as outdoor recreation, infrastructure/amenity needs, and climate change and to hear environmental perceptions through local residents' own words. Two focus groups were also conducted, using the same questions as the interviews. In total, 24 residents participated in the

interviews or focus groups. Each participant was provided with a $25 Visa card as compensation. Six interviews were conducted in English, and the other interviews and focus groups were conducted in Spanish.

Opinions were sought from communities most impacted by environmental burdens, and thus, participants were recruited primarily from the Eastern Coachella Valley. In total, 19 participants were Eastern Coachella Valley residents, and five were Western Coachella Valley residents. These Western Coachella Valley residents participated because of their relevant lived experience. These were a Palm Springs resident active in environmental justice advocacy, a Palm Desert resident who was raised in the Eastern Coachella Valley, a La Quinta resident who is active in Eastern Coachella Valley environmental education efforts, an Indio resident also active in Eastern Coachella Valley environmental education, and an Indio resident raised in the Eastern Coachella Valley.

Results

Results include detailed analyses of the environmental questions and summaries from the interviews. These three survey questions are compared to resident demographics/characteristics. Analyzing survey responses by demographics allowed us to determine how people of different backgrounds have different perceptions of these environmental topics. Additionally, after the examination of these core demographics, analyses were performed on statistically significant findings for other health-related information on residents living in the Coachella Valley. Lastly, interviews were also conducted with residents living in the Eastern Coachella Valley to better understand environmental perceptions. Findings from these interviews are included throughout the results of the report.

Demographics

For context, adult demographics for the entire Coachella Valley are provided in this section. The average age for Coachella Valley adults is 56 years. The Coachella Valley is fairly evenly split between those assigned male and female. Further, half of Coachella Valley adults (49.5%) have attended at least some college. About one in five Coachella Valley adults (19.4%) are living at or below the federal poverty line (FPL).

Slightly less than half (44.5%) of Coachella Valley adults identify as Hispanic only, and slightly more (47.2%) identify as non-Hispanic White.

While the demographics suggest that the valley is evenly split between White and Hispanic residents, settlement is defined by de-facto racial segregation, where, for example, the wealthiest city (Indian Wells) has a Hispanic population of 5.4%, whereas a historically working-class city (Coachella) has a Hispanic population of 97.3%.[1] Racial divisions are also evident in the labor force, where Hispanic immigrants are employed in low-paying farm labor, and other Hispanic residents work in the region's low-wage hospitality and services industries.

Environment Perceptions

More than three-quarters (78.5%) of adults reported that the air quality in their neighborhood is good, very good, or excellent. Conversely, slightly less than a quarter (21.5%) of adults reported that the air quality in their neighborhood is poor or fair.

[1] American Community Survey – Five Year Estimates. (2015-2019).

About half (47.4%) of respondents reported that poor air quality does indeed stop them from doing outdoor activities in their neighborhood.

The majority (91.4%) of adults reported that they are somewhat, very, or extremely willing to change their lifestyle to reduce harm to the environment. A smaller percentage of 8.6% of adults reported that they were not at all or not so willing to change their lifestyle.

Regional and Demographic Comparisons

Air Quality

In many cases, perceptions of air quality, being inhibited from outdoor activities due to poor air quality, and willingness to change lifestyle vary significantly by certain demographics. For instance, perceptions of air quality significantly differ based on regional location, with 39.4% of Eastern Coachella Valley residents reporting poor or fair air quality compared to 18.9% of Western Coachella Valley residents.

Hispanic adults (29.8%) tend to report significantly higher percentages of poor or fair air quality compared to non-Hispanic, White adults (13.9%). Perceptions of poor air quality also vary by sex, with a significantly higher proportion of females (26.4%) perceiving air quality to be poor or fair compared to males (17.3%). Perceptions of air quality significantly differ based on age group, with younger ages tending to perceive lower quality air in their neighborhood compared to older age groups (60s and older). Specifically, a significantly higher proportion of adults ages 18-29 (40.0%) perceive air quality to be poor or fair compared to those in their 60s (14.8%), 70s (12.9%), and 80s (6.8%).

Perceptions of air quality significantly differ based on poverty level classifications. Specifically, a significantly higher proportion of those living at 0-100% of the federal poverty line (FPL) (31.2%), 101-200% of FPL (26.9%), and 201-250% of FPL (32.5%) perceive air quality to be poor or fair compared to those living at more than 300% of the federal poverty level (12.8%).

Air quality perceptions do not vary significantly based on educational attainment.

Outdoor Activities Inhibited by Poor Air Quality

Outdoor activities being inhibited by poor air quality significantly vary by demographic factors such as region and age group. For instance, a significantly higher percentage of respondents in the Eastern Coachella Valley reported poor air quality has stopped them from doing outdoor activities (64.0%), compared to residents in the Western Coachella Valley (44.9%). In regard to age, a significantly larger proportion of adults in their 40's (56.3%) and 50's (48.9%) reported that air quality impacts their outdoor activities in comparison to adults who are in their 80's (30.4%). Air quality's impact on outdoor activity did not vary significantly by race/ethnicity, gender, poverty, or education.

Willingness to Change Lifestyle

Willingness to change lifestyle to reduce damage to the environment does significantly vary based on geographic region. More than 90% of Eastern Coachella Valley and Western Coachella Valley residents are willing to make changes to reduce damage to the environment.

Willingness to change lifestyle to reduce harm to the environment varies significantly based on race by ethnicity. Specifically, a significantly greater proportion of Hispanic adults (94.6%) report that they are somewhat, very, or extremely willing to change their lifestyle when compared to non-Hispanic, White adults (89.0%) and non-Hispanic, other races (74.4%). A significantly greater proportion of females (95.5%) report that they are somewhat, very, or extremely willing to change their lifestyle to reduce harm to the environment than males (87.8%). Willingness to change lifestyle to reduce harm to the environment varies significantly by age group. Specifically, a significantly smaller proportion of those 80 years and older (78.7%) report that they are willing to make changes when compared to those in their 30s (96.7%), 50s (92.9%), and 60s (91.1%).

Willingness to change lifestyle to reduce damage to the environment does not significantly vary based on poverty level or educational attainment.

Air Quality Comparisons

Perceptions of air quality vary significantly by a variety of adult characteristics. For instance, higher percentages of respondents living with fair (41.2%) or poor (35.8%) general health reported having poor or fair air quality compared to those with excellent (19.1%), very good (13.3%), or good (20.7%) general health. A significantly smaller proportion of respondents (17.0%) who feel like they have a safe place to walk, bike, or hike in their neighborhood perceive air quality to be low compared to those who do not feel like they have a safe place to do these things (48.8%). A significantly smaller proportion of respondents who responded to having health insurance coverage perceive air quality to be low (19.2%) compared to those who did not have health insurance coverage (43.2%).

Experiences with racism were also related to poor air quality perceptions. That is, a higher percentage of adults who reported having experienced racism (32.4%) reported poor or fair air quality compared to those who did not report having experienced racism (17.5%).

The effects of COVID-19 were also somewhat correlated with poor air quality perceptions. A significantly higher proportion of respondents (30.3%) who reported experiencing financial difficulties due to COVID-19 in paying their rent/mortgage perceive air quality to be low, compared to those who did not experience these financial difficulties (19.9%). Further, a significantly higher proportion of respondents (31.5%) who reported experiencing financial difficulties due to COVID-19 in paying for basic necessities such as bills, tuition, groceries, etc., perceive air quality to be low, compared to those who did not experience these financial difficulties (18.9%). Lastly, a significantly higher proportion of respondents (33.5%) who reported experiencing other financial challenges due to COVID-19 perceive air quality to be low, compared to those who did not experience any other financial challenges (19.5%).

Environmental Concerns and Opinions of Residents

The interviews, in addition to exploring several of the topics addressed in the survey, also focused on topics beyond the scope of the survey data. As detailed in the interview results sections above, interviewees were asked about air quality, if air quality impedes outdoor activity, and what could be done to change one's local environment. As detailed below, interviewees were also asked about environmental health concerns, access to outdoor recreation, climate change, and observed changes in the environment over time.

Interview respondents, when asked about their environmental health concerns, mentioned conditions exacerbated by air quality as well as other concerns. As illustrated below, these included asthma, allergies, potable water, pesticides, child nosebleeds, and exposure to heat*t*

Another concern was the health impacts of pesticide exposure. The Eastern Coachella Valley has a large patchwork of agricultural fields, vineyards, and orchards.

Interviewees were also asked how to make outdoor recreation more accessible to underserved communities. This would include recreation such as hiking, camping, or taking walks. As illustrated below, many residents mentioned barriers to accessing outdoor spaces, such as a lack of adequate parks, long distances to outdoor recreation areas, a lack of adequate transportation, the high cost of entrance fees, a lack of awareness, and a lack of free time from work.

Interviewees were also asked about their opinions regarding climate change. Most expressed concerns about climate change's local impacts, such as temperature fluctuations, loss of habitat, drought, floods, unpredictable weather, or higher temperatures.

Interviewees were also asked about changes they have observed in their environment and what changes they would like to see. Many interviewees have lived in their community for a decade or longer, some for their whole lives. Observed environmental changes over time included higher temperatures, more development/gentrification, more flying insects, the shrinking of the Salton Sea, population increase, more trash along the road, more brush fires, and more children getting sick.

Interviewees were asked about what future changes they would like to see in their community, and what an "ideal environment" would look like. The vast majority described an "ideal" environment as one that simply includes basic conditions and services, such as clean air, potable water, more parks and green spaces, affordable trash service, a revived Salton Sea, and community centers. Residents articulated a basic desire to live in a healthy environment—a fundamental right.

Conclusion

This report shows that air quality and air quality's hindrance on outdoor activity vary by geography and demographics. Higher percentages of Hispanic residents report poor or fair air quality than do White residents. The same is true for female residents (compared to male residents) and younger residents (compared to older residents). Those living below the federal poverty level also report poorer air quality than those well above the federal poverty level. Further, higher percentages of residents in the Eastern Coachella Valley report poor or fair air quality compared to those in the Western Coachella Valley.

Fewer differences were statistically significant for air quality's hindrance on outdoor activity; however, similar patterns emerge. Younger residents are more likely to report that air quality prevents outdoor activity than older residents. The same is true for those living below the federal poverty level, whose outdoor activity is more likely to be impeded by air quality than for those well above the federal poverty level. Additionally, more residents in the Eastern Coachella Valley reported that poor air quality had impeded them from doing outdoor activities compared to those in the Western Coachella Valley.

In regard to those who reported poor or fair air quality, similar patterns appeared. Poorer air quality was reported by residents who have worse general health, residents who do not have a safe place to recreate outdoors in their neighborhood, residents with no health insurance, and residents who report experiencing racism.

There are similar though less dramatic differences among people's willingness to change lifestyle to minimize their harm to the environment, given that such willingness was high across all groups. Higher percentages of Hispanic residents expressed willingness to change their lifestyle for the environment than did White residents, although both groups reported high percentages. This greater willingness to change lifestyle for the environment was also found among female residents, younger residents, and residents of the Eastern Coachella Valley.

While survey results showed a clear pattern of disproportionate impacts of poor air quality on underprivileged social groups, the interview results detailed these differences. Interviewees stressed that air pollution (from the Salton Sea, vehicles, dirt roads, agricultural burning, pesticides, etc.) is a major concern in the Eastern Coachella Valley because of health impacts (e.g., allergies and asthma). Interviewees stressed the importance of accessing the outdoors, such as walking in one's neighborhood or visiting nearby parks. Interviewees also expressed concern about climate change, such as rising temperatures and weather fluctuations. The interviews also touched on other environmental concerns, such as drinking water contamination, dumping, trash in the streets, swarms of insects, and pesticides.

These results document local environmental disparities. Environmental burdens disproportionately affect the Eastern Coachella Valley as well as all valley residents who are younger, female, Hispanic, and living in poverty, among other social characteristics. The Coachella Valley epitomizes the concerns of environmental justice.

These geographic and demographic disparities are further dramatized when one considers the extraordinary concentration of wealth and privilege found in pockets of the Western Coachella Valley, in neighborhoods of Palm Springs and Palm Desert, for example, or in the cities of Rancho Mirage and Indian Wells. The west end of the valley is home to multi-million-dollar homes, fountains and artificial lakes, gated country clubs, and luxury resorts, and the east end is home to poorly maintained trailer parks, contaminated wells, dirt roads, and expansive orchards and open fields. At the same time, working-class and non-White communities are found across the region, not only on the eastern side of the valley but also on the western side (such as in cities of Cathedral City and Desert Hot Springs, which are both majority Hispanic). Thus, although concentrated in the east, Hispanic, low-income communities across the region are disproportionately exposed to and impacted by poor air quality. Understanding environmental justice in the Coachella Valley thus calls for examining the issue not by a simple dichotomy but a dual axis, as environmental disadvantage is correlated with both geographical and social differences.

Introduction

About HARC

HARC, Inc., is a 501(c)(3) nonprofit organization that specializes in research and evaluation services. HARC was founded to help tell the story of the Coachella Valley through a quantitative lens, as the only data available to our region was at the county level. To collect local health data, HARC began administering a triannual community health survey. Having a local research firm enables health leaders and service providers to identify health disparities, inequities, unhealthy behaviors, and trends.

HARC has since expanded to not only continue its triannual survey, but also to provide other research and evaluation services. These services include needs assessments, program evaluations, analyses of existing data, and much more. HARC provides customized analytical consulting services, tailored to the needs of its clients to help them answer important questions regarding those they serve. Doing so enables our clients to evaluate the great work that they do and to make the Inland Empire a healthier, and ultimately, happier place to live.

The Coachella Valley Community Health Survey

The Coachella Valley is a unique community located within Riverside County in Inland Southern California. HARC was founded in 2006 to provide objective, reliable data pertaining to this portion of the County. Since then, every three years, HARC conducts a massive random sample survey of the Coachella Valley. Randomly sampling the community is an extraordinary effort to undertake; however, this random sampling method enables HARC to reliably estimate the characteristics of our community.

The data acquired from this survey are used by nonprofit health and human services agencies, hospitals, federally qualified health centers, institutions of higher education, K-12 educational administrations, governmental agencies, and media organizations, among others. These organizations use the data to better understand the people who live in our region and also to apply for funding, prioritize health needs, develop programs to address those needs, create presentations/lectures, write articles, design and conduct trainings, and make/change policy.

Most notable among these uses is how the data have strengthened local nonprofits' requests for funding. Dozens of nonprofits have used this data over the last decade to make compelling requests for funding and have successfully generated millions of dollars each survey cycle. These funds have provided support for critically important programs and services, such as mental health counseling for children, pregnancy prevention education for teens, medical care for uninsured adults, meal delivery for homebound seniors, and HIV testing for all.

HARC is hopeful that the findings from the present report will aid local organizations and community members in better understanding people's experience with the environment, and how this may differ based on certain groups.

This Report on Environmental Justice

The data collected across the Coachella Valley allows HARC to examine certain characteristics of the population more closely. For this report, the focus is on environmental perceptions such as those regarding neighborhood air quality, willingness to change lifestyles for the sake of the environment, and inability to engage in outdoor activities due to poor air quality.

HARC included these new questions on our 2022 triennial population survey due to common concern about environmental justice, especially given that the Eastern portion of the valley has been negatively affected by the Salton Sea. Air quality has long been a matter of concern in the, given historically high levels of pollution such as ozone.[2] Air pollution is blown into the valley from the Los Angeles basin, combining with pollution from local sources such as trucks, power generation, agricultural burning, and fugitive dust from roads and construction.[3] Air quality is expected to worsen, especially in the Eastern Coachella Valley, as the Salton Sea shrinks, exposing emissive dust from growing expanses of dried lakebed.[4] Further, the areas surrounding the Salton Sea (Mecca, Thermal, Oasis, and North Shore), rely on agricultural labor. These farmworkers are faced with long hours outdoors and physically intense labor, which may further aggravate potential exposure to harmful pollutants. Altogether, the surrounding communities of the Salton Sea are facing an environmental justice crisis.

This report includes the newly added environmental survey questions (neighborhood air quality, willingness to change, and limiting outdoor activities) along with detailed advanced analyses such as how responses to these questions may statistically vary based on region (Eastern compared to Western Coachella Valley) demographics (gender, age, poverty status), and other characteristic such as general health status, food insecurity, and healthcare access.

This report also includes results from a series of interviews (and two focus groups) conducted with 25 residents, mostly from the Eastern Coachella Valley. Interviews revolved around environmental justice concerns, including air quality and access to outdoor recreation. These interviews included topics addressed in the survey, such as air quality, as well as other topics, such as climate change and outdoor recreation access. This report includes a summary of the most common themes discussed and quotations from participants.

---

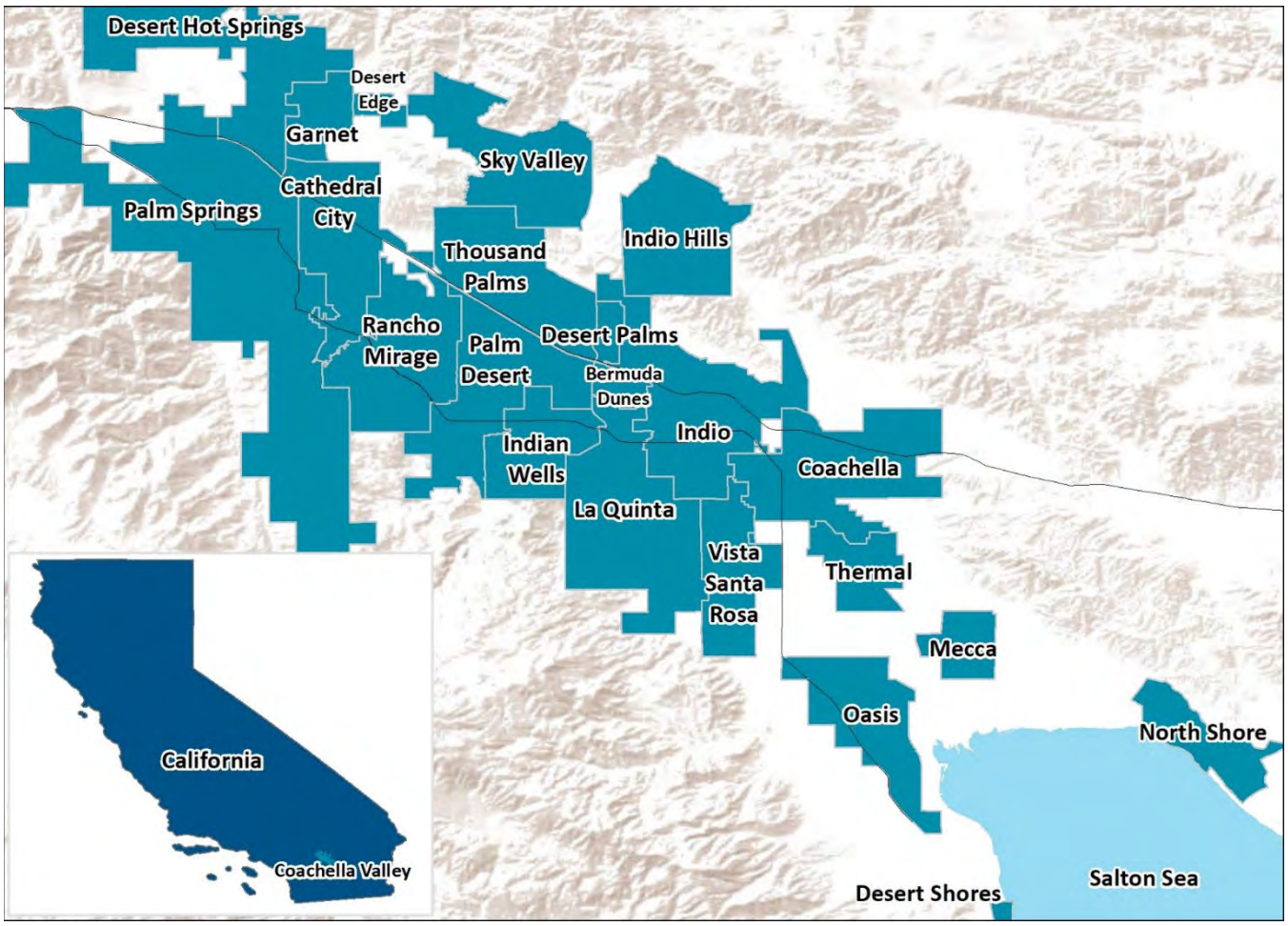
[2] Wilson, J. (12 April 2019). "Palm Springs: One of the smoggiest spots in the US?" *The Desert Sun*. https://www.desertsun.com/story/news/environment/2019/04/12/smog-palm-springs-coachella-valley-worst-air-quality-rating/3431771002/

[3] Eastern Coachella Valley (ECV) Community – AB 617. (2022). South Coast Air Quality Management District. https://scaqmd-online.maps.arcgis.com/apps/MapJournal/index.html?appid=78391247396f4a91b16285f0297d6e83

[4] University of California, Riverside Salton Sea Task Force. (2021). Crisis at the Salton Sea: The Vital Role of Science. Environmental Dynamics and GeoEcology (EDGE) Institute, University of California, Riverside. https://www.saltonseataskforce.ucr.edu/__files/ugd/0d73bf_f8133ee80a30473ca565ecab181e31a1.pdf

Coachella Valley Geography

This report focuses on the health status of the Coachella Valley in eastern Riverside County, California. Federally-recognized tribal areas within the Coachella Valley include the reservations of the Agua Caliente Band of Cahuilla Indians, the Augustine Band of Cahuilla Indians, the Twenty-Nine Palms Band of Mission Indians, and the Torres-Martinez Desert Cahuilla Indians. The Coachella Valley is made up of nine cities (Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, and Rancho Mirage) as well as several unincorporated areas (such as Bermuda Dunes, Mecca, North Shore, Oasis, Thermal, and Thousand Palms, among others).



Methods

Data Collection

Many of the questions in this survey were modeled after the well-respected Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS) and the California Health Interview Survey (CHIS). The questions assessed topics such as access to and utilization of healthcare, health status indicators, health insurance coverage, and health-related behaviors.

To improve the efficiency of collecting data in a timely manner, HARC conducted address-based mailing using paper surveys. This method has been utilized by the California Health Interview Survey[5] in recent years with much success and also by HARC in partnership with Riverside University Health System – Public Health. With this method, residents received an envelope in the mail which included a letter that described the survey, the actual survey, a prepaid pre-addressed envelope, and a $2 bill "pre-incentive" that was theirs to keep regardless of their participation. Utilization of this method means that this survey does not include people who live in group home settings (such as nursing homes, assisted living facilities, jails, or prisons, etc.) or those who are homeless. The use of a paper survey also necessitated that the survey participant be literate. Data collection spanned from April 2022 to August 2022 with 2,447 adults completing the survey.

Data Weighting

Once data collection was complete, the data was weighted by a statistician to the five-year (2016 - 2020) Census population estimates of the Coachella Valley (nine incorporated cities in the Coachella Valley combined with the 12 census-designated places) to most accurately represent the entire population living here. Specifically, data was weighted to five variables: race and ethnicity, education, gender, age, and geographic location (city/census-designated place). Missing data were imputed using a hot-deck method; for more detail on the weighting methodology, please contact HARC.

Weighting the data is essential to ensure that the 2,447 surveyed adults represent the approximately 350,000+ adults living in the Coachella Valley. As such, the weighted percentages and population estimates presented in the report represent estimates that are weighted from the 2,477 respondents to the 350,000+ adults of the region.

[5] California Health Interview Survey. (n.d.) UCLA Center for Health Policy Research. https://healthpolicy.ucla.edu/chis/design/Pages/methodology.aspx

Understanding the Data

As mentioned earlier, figures/tables may include estimates such as "percentages," "frequencies," "counts," etc. These all refer to weighted estimates and percentages. Furthermore, the survey results contain data for and are weighted for only the **adult population** of Coachella Valley.

In many areas of the report, highlighting differences between certain groups (e.g., Western Coachella Valley and Eastern Coachella Valley) is accomplished through identifying **statistically significant results**. If results are statistically significant during analyses, they are noted as being "significant" in the narratives of the report. These results mean that the analyses provided evidence of a true difference between the comparisons being made; that is, differences found are likely to be real differences. For brevity, detailed statistics regarding these statistical tests are omitted but can be provided upon request.

It is worth noting that a statistically significant difference is not necessarily a meaningful difference. Whether a difference is "meaningful" is a judgement call, not a statistical test; and must be based on knowledge and experience of the topic, the context, and the region. Many significant differences are meaningful—such as those that highlight disparities by gender, ethnicity, or income, whereas other differences detected may not be meaningful. This is something that must be decided subjectively.

This report is based on weighted data analyzed by a variety of categories, and thus, there are times when the data may become unreliable (**statistically unstable estimates**). These statistically unstable estimates are based on the ratio of the standard error of the estimate to the estimate itself. When this ratio exceeds 30%[6], the estimate is deemed unreliable and should not be interpreted. When this occurs in the report, the unstable estimate in the figure/table is identified in **red** and is not evaluated in the narratives. Readers should interpret these red numbers with great caution.

Lastly, it is important to note that the data presented in this report are *perceptions* of local adults. For brevity, the narratives may refer to poor air quality ratings, effects of poor air quality, etc., however, these data always refer to perceptions by residents, and not necessarily objective air quality measurements.

Community Interviews

This special report also included a series of community interviews to explore topics such as outdoor recreation, infrastructure/amenity needs, and climate change and to hear environmental perceptions through local residents' own words. Two focus groups were also conducted, using the same questions as for the interviews. In total 24 residents participated in the interviews or focus groups. For simplicity, all interview and focus group participants are referred to as "interviewees" in the report.

The Community Advisory Board assisted in the recruitment of community members as well as the development of interview questions. The interview questions included two of the three environmental questions from the survey: perception of neighborhood air quality and impact of

[6] California Health Interview Survey (n.d.). UCLA Center for Health Policy Research. https://healthpolicy.ucla.edu/chis/faq/Pages/default.aspx#e4

air quality on outdoor activity. However, the third environmental question from the survey (willingness to change lifestyle for the environment) was not included in the interviews. Interviews focused on underserved communities rather than the general population (as with the survey). It was decided that the interviews should avoid implying that underserved communities might have a disproportionate burden to bear (willingness to change lifestyle) to reduce harm to the environment. The opposite is true: wealthy individuals use far more resources (such as fossil fuels) than low-income individuals. Instead, interviewees were asked what could be done generally to make positive changes to their environment (inviting responses about individual or collective changes).

For the list of interview questions, see the Appendix.

Opinions were sought from communities most impacted by environmental burdens, and thus, participants were recruited primarily from the Eastern Coachella Valley. In total, 19 participants were Eastern Coachella Valley residents, and five were Western Coachella Valley residents. These Western Coachella Valley residents participated because of their relevant lived experience. These were a Palm Springs resident active in environmental justice advocacy, a Palm Desert resident who was raised in the Eastern Coachella Valley, a La Quinta resident who is active in Eastern Coachella Valley environmental education efforts, an Indio resident also active in Eastern Coachella Valley environmental education, and an Indio resident raised in the Eastern Coachella Valley.

The interviews took place either over the phone or by Zoom video call, and the two focus groups took place in person (at the Mecca Community Center). The interviews and focus groups each lasted about 30 minutes to one hour. Each participant was provided with a $25 Visa card as compensation. Six interviews were conducted in English, and the other interviews and focus groups were conducted in Spanish. These conversations were audio recorded and transcribed. The transcriptions were then analyzed (using the software MAXQDA), for which common themes/responses were grouped together to identify the most prevalent and pressing concerns.

Results

Results that follow include detailed analyses on environmental questions. Specifically, the analyses pertain to the following questions:

- Air Quality: “How would you rate the air quality in your neighborhood?”
- Willingness to Change Lifestyle: “How willing are you to change your lifestyle to reduce the damage you cause to the environment?”
- Outdoor Activities Inhibited by Poor Air Quality: “Does poor air quality ever stop you from doing outdoor activities in your neighborhood?”

These three questions are compared to other resident demographics/characteristics such as regional geography, race crossed with ethnicity, sex, age group, poverty status, and educational attainment. Altogether, differences in responses to these three questions are assessed in terms of these core demographics. Analyzing community perception by various demographics allowed us to determine how people of different backgrounds have different perceptions of these environmental topics.

Additionally, after the examination of these core demographics, analyses are performed on statistically significant findings for other health-related information on residents living in the Coachella Valley. Specifically, we examine how perceptions of air quality vary based on general health status; experiences of racism; major diseases; having a safe place to walk, bike, or hike; food insecurity; healthcare access; and COVID-19 financial impact.

Lastly, this special report also included a series of community interviews on topics such as outdoor recreation, infrastructure needs, health concerns, and climate change. These interviews helped to explore some of the main topics within this report in greater detail, understanding the environmental perceptions of local residents in their own words. When relevant, these findings are provided throughout the results section.

Demographics

Age

There are approximately 336,000 adults ages 18 and older living in the Coachella Valley. The average age for Coachella Valley adults is 56 years.

Table 1. Age Groups

Age Group	Weighted Percent	Population Estimate
18 to 29	7.4%	24,283
30s	13.0%	42,843
40s	13.7%	44,912
50s	21.3%	69,950
60s	20.1%	66,100
70s	16.3%	53,603
80s and up	8.3%	27,317
Total	**100.0%**	**329,008**

Gender

To measure gender/gender identity, HARC utilizes the recommended two-question approach designed by the Williams Institute.[7] The first question asks what sex the individual was assigned at birth, on their original birth certificate. As illustrated in the table below, the Coachella Valley is fairly evenly split between those assigned male and female, with a slight over-representation of males. The second question asks how individuals currently identify themselves.

As illustrated in the table below, more than 1,317 local adults identify as transgender or another gender identification. For 0.9% of local adults (3,130 people), the sex they were assigned at birth does not match their gender identity now. It may be that they were assigned the sex of male at birth and now identify as female, vice versa, or that they now identify as transgender or another gender identity.

Table 2. Sex and Gender

Sex and Gender	Weighted Percent	Population Estimate
Sex Assigned at Birth		
Male	53.3%	178,903
Female	46.7%	156,945
Total	**100.0%**	**335,848**
Current Gender Identification		
Male	52.8%	176,879
Female	46.8%	156,707
Transgender	0.3%	1,061
Do not identify as female, male, or transgender	0.1%	256
Total	**100.0%**	**334,903**

[7] The GenIUSS Group. (2014). Best Practices for Asking Questions to Identify Transgender and Other Gender Minority Respondents on Population-Based Surveys. J.L. Herman (Ed.). Los Angeles, CA: The Williams Institute.

Race/Ethnicity

Participants were asked to report their race and ethnicity in two questions, via the protocol utilized by the U.S. Census Bureau. To assess race, participants were asked, "Which one of these groups would you say best represents your race? For the purposes of this survey, Hispanic is not a race." As illustrated in the table below, most Coachella Valley adults identify their race as "White/Caucasian," but there is also a substantial proportion who identify as "other." Those selecting "other" were invited to specify (write in) their racial identity. Many participants wrote in a racial identity that is Hispanic (e.g., "Mexican," "Latino," "Hispanic," etc.).

Table 3. Race

Race	Weighted Percent	Population Estimate
White/Caucasian	76.4%	234,309
Black/African American	2.9%	8,797
Asian/Asian American	3.8%	11,792
American Indian/Alaska Native	1.6%	4,838
Other	15.3%	46,987
Total	**100.0%**	**306,724**

To assess ethnicity, participants were asked, "Are you of Hispanic, Latino, or Spanish origin?" As illustrated in the table below, slightly less than half of local adults (45.4%) identify as Hispanic/Latino. Of these, most local Hispanic/Latino adults identify as Mexican, Mexican American, or Chicano.

Table 4. Ethnicity

Ethnicity	Weighted Percent	Population Estimate
Not of Hispanic, Latino, or Spanish Origin	54.6%	175,800
Hispanic, Latino, or Spanish origin: Mexican, Mexican American, Chicano	36.0%	116,135
Hispanic, Latino, or Spanish origin: Cuban	0.6%	1,942
Hispanic, Latino, or Spanish origin: Puerto Rican	0.3%	847
Hispanic, Latino, or Spanish origin: Other	8.5%	27,505
Total	**100.0%**	**322,228**

Race can also be crossed with ethnicity to provide clarity on the number of adults identifying as Hispanic (e.g., when asked about race, respondents may choose "other" since Hispanic is not an option). When doing so, slightly less than half (44.5%) identify as Hispanic only.

Table 5. Race by Ethnicity

Race	Weighted Percent	Population Estimate
Hispanic	44.5%	151,042
NH (Non-Hispanic), Asian	3.0%	10,326
NH (Non-Hispanic), Black	2.3%	7,694
NH (Non-Hispanic), Other	3.0%	10,326
NH (Non-Hispanic), White	47.2%	160,151
Total	**100.0%**	**339,538**

While the demographics suggests that the valley is evenly split between White and Hispanic residents, settlement is defined by de-facto racial segregation, where, for example, the wealthiest city (Indian Wells) has a Hispanic population of 5.4%, whereas a historically working-class city

(Coachella) has a Hispanic population of 97.3%.[8] Racial divisions are also evident in the labor force, where Hispanic immigrants are employed in low-paying farm labor and other Hispanic residents work in the region's low-wage hospitality and services industries.

Income and Poverty

The Coachella Valley is characterized by extreme wealth and extreme poverty in close proximity. For example, the median household income in the city of Indian Wells is $112,680.[9] Just 30 miles away is a community of a similar size, Oasis, with a median household income of only $20,598.[10] Participants were asked, "Last year, what was your household income from all sources before taxes?" HARC then grouped income levels together in the categories below for reporting purposes.

Results show that 16.9% of local adults are living in households with an annual income of less than $20,000, as illustrated in the table below. At the other end of the spectrum, 22.7% of adults have relatively high income levels, residing in households with six-figure annual incomes.

Table 6. Income

Income Group	Weighted Percent	Population Estimate
$0 to $19,999	16.9%	42,959
$20,000 to $49,999	34.1%	86,640
$50,000 to $99,999	26.2%	66,595
$100,000 or more	22.7%	57,522
Total	**100.0%**	**253,717**

Participants were asked to report their household income and the number of people residing within their household. This information was used to calculate poverty levels per the Department of Health and Human Services' guidelines for poverty in 2022. For example, for a single person, the poverty line is $13,590 per year, while for a family of four, it is $27,750 per year.[11]

Results indicate that one in five Coachella Valley adults (19.4%) are living at or below the federal poverty line (FPL), as illustrated in the table below.

Table 7. Poverty Level

Poverty Level	Weighted Percent	Population Estimate
0% to 100% FPL	19.4%	48,375
101% to 200% FPL	22.9%	56,924
201% to 250% FPL	7.9%	19,620
251% to 300% FPL	5.8%	14,423
Above 300% FPL	44.0%	109,608
Total	**100.0%**	**248,949**

[8] American Community Survey – Five Year Estimates. (2015-2019).
[9] U.S. Census Bureau, 2021 American Community Survey, 5-year estimate (in 2021 dollars)
[10] Ibid.
[11] Poverty Guidelines. (2022). U.S. Department of Health and Human Services. https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines

Educational Attainment

Higher education is generally associated with a higher quality of life. People with higher levels of education tend to have greater social networks, more connections/support in the community, and better general health and well-being.[12] Education also has a strong positive correlation with higher income levels; those with a master's degree earn more than those with some college but no degree.[13]

Half of Coachella Valley adults (49.5%) have attended at least some college, as illustrated in the table below. However, 17.8% of local adults lack a high school degree or equivalency, including more than 8% who never attended high school at all.

Table 8. Educational Attainment

Highest Education Level	Weighted Percent	Population Estimate
Never attended school	1.0%	3,152
8th grade or less	7.1%	23,452
Some high school (grades 9 – 11)	9.7%	31,989
High school graduate or GED certificate	28.1%	92,381
Some technical school	1.7%	5,501
Technical school graduate	2.8%	9,300
Some college	22.3%	73,339
College graduate	15.1%	49,705
Postgraduate or professional degree	12.1%	39,796
Total	**100.0%**	**328,615**

[12] Employment Projections. (2016). United States Department of Labor. http://www.bls.gov/emp/ep_chart_001.htm

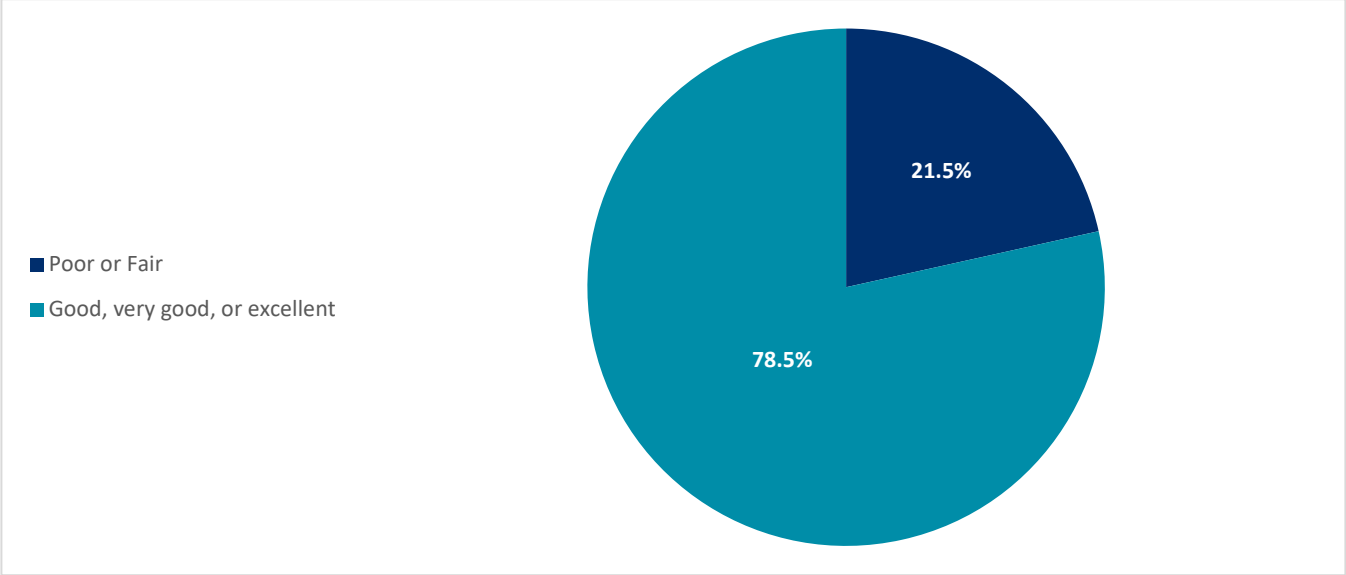
[13] Measuring the Value of Education. U.S. Bureau of Labor Statistics. https://www.bls.gov/careeroutlook/2018/data-on-display/education-pays.htm

Environment Perceptions

Perceptions of Air Quality In The Neighborhood

To assess perceptions of air quality, respondents were asked, "How would you rate the air quality in your neighborhood?" As illustrated in the figure below, more than three-quarters (78.5%) of adults reported that the air quality in their neighborhood is good, very good, or excellent. Conversely, slightly less than a quarter (21.5%) of adults reported that the air quality in their neighborhood is poor or fair.

Figure 1. Air Quality Perceptions



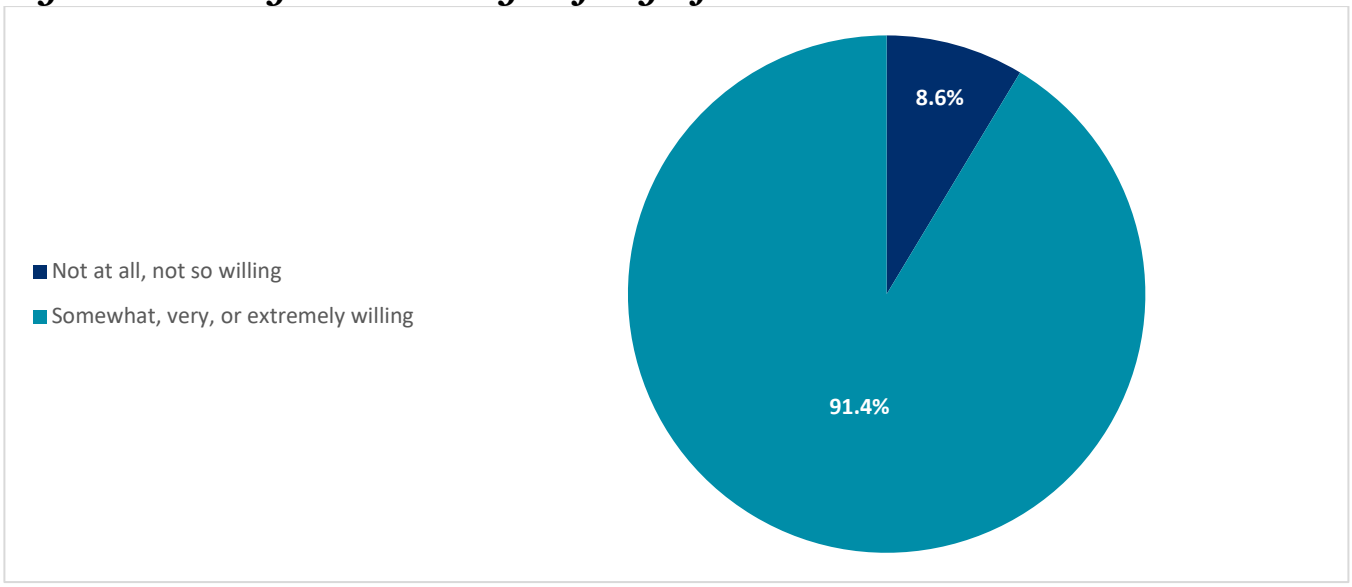
Note: *n* = 336,972

Willingness to Change Lifestyle

Environmental challenges, whether local or global, often call for changes to individual lifestyle. For example, the mitigation of local air pollution and greenhouse gas emissions both call for the widespread adoption of electric vehicles, among other measures. Other behavioral changes that have been often proposed in the name of environmental protection include composting, using fewer plastics, or conserving water. To assess how receptive residents are to such approaches, survey respondents were asked, "How willing are you to change your lifestyle to reduce the damage you cause to the environment?"

As illustrated in the figure below, the majority (91.4%) of adults reported that they are somewhat, very, or extremely willing to change their lifestyle to reduce damage to the environment. A smaller percentage of 8.6% of adults reported that were not at all, or not so willing to change their lifestyle.

Figure 2. Willingness to Change Lifestyle for Environment

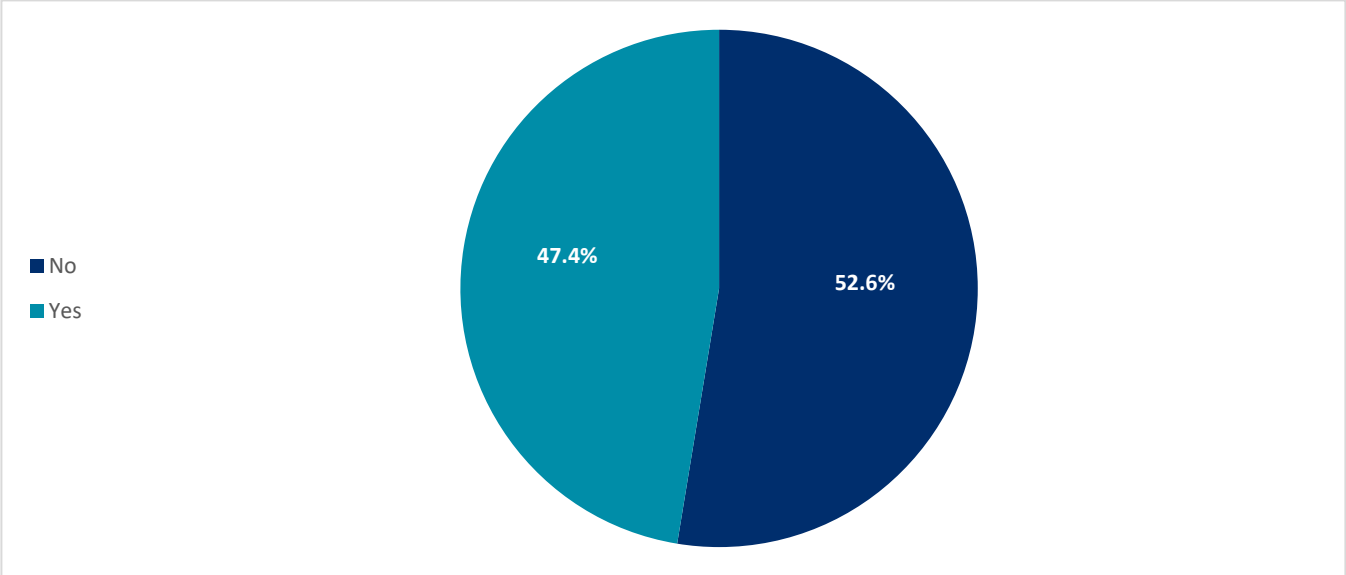


Note: n = 331,393

Outdoor Activities Inhibited by Poor Air Quality

Poor air quality can limit outdoor activities, especially for those who have asthma or other respiratory ailments. To assess this effect among residents, survey respondents were asked, "Does poor air quality ever stop you from doing outdoor activities in your neighborhood?" About half (47.4%) of respondents reported that poor air quality does indeed stop them from doing outdoor activities in their neighborhood.

Figure 3. Poor Air Quality Prevents Outdoor Activities



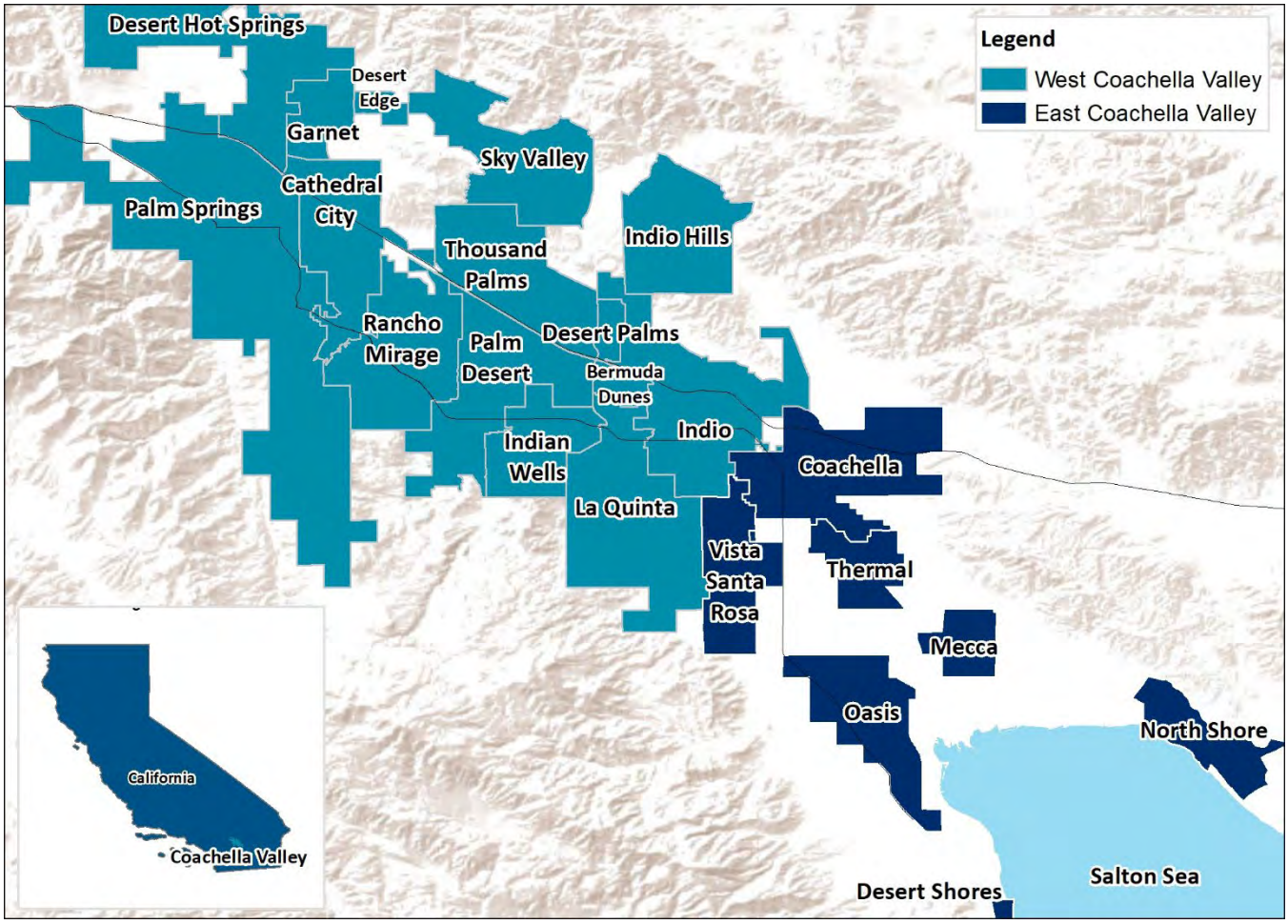
Note: *n* = 297,214

Regional and Demographic Comparisons

Air Quality

Region

As mentioned earlier, air quality has long been a matter of concern in the Coachella Valley, given historically high levels of pollution such as ozone.[14] Air pollution is blown into the valley from the Los Angeles basin, combining with pollution from local sources such as trucks, power generation, agricultural burning, and fugitive dust from roads and construction.[15] Air quality is expected to worsen, especially in the Eastern Coachella Valley, as the Salton Sea shrinks, exposing emissive dust from growing expanses of dried lakebed.[16] For context, the data in this report group the Eastern Coachella Valley as Coachella, Mecca, North Shore, Oasis, Thermal, and Vista Santa Rosa. Western Coachella Valley, on the other hand, comprises Bermuda Dunes, Cathedral City, Desert Edge, Desert Hot Springs, Desert Palms, Garnet, Indian Wells, Indio, Indio Hills, La Quinta, Palm Desert, Palm Springs, Rancho Mirage, Sky Valley, and Thousand Palms. See the map below for the Western and Eastern boundaries.



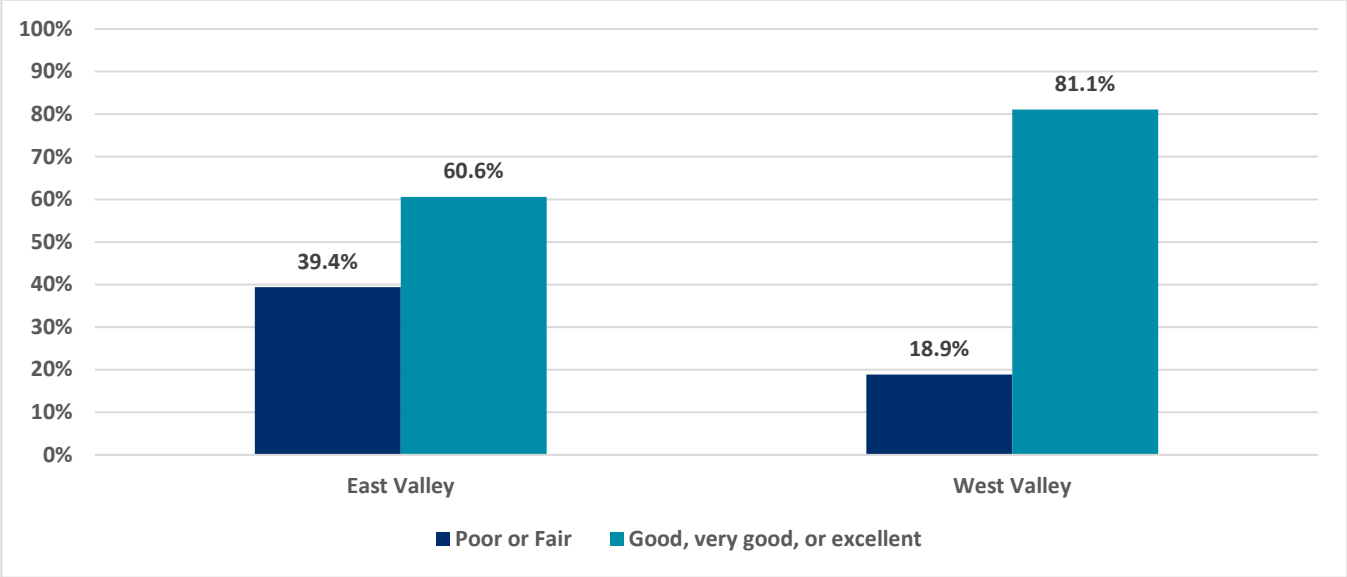
[14] Wilson, J. (12 April 2019). "Palm Springs: One of the smoggiest spots in the US?" *The Desert Sun*. https://www.desertsun.com/story/news/environment/2019/04/12/smog-palm-springs-coachella-valley-worst-air-quality-rating/3431771002/

[15] Eastern Coachella Valley (ECV) Community – AB 617. (2022). South Coast Air Quality Management District. https://scaqmd-online.maps.arcgis.com/apps/MapJournal/index.html?appid=78391247396f4a91b16285f0297d6e83

[16] University of California, Riverside Salton Sea Task Force. (2021). Crisis at the Salton Sea: The Vital Role of Science. Environmental Dynamics and GeoEcology (EDGE) Institute, University of California, Riverside. https://www.saltonseataskforce.ucr.edu/__files/ugd/0d73bf_f8133ee80a30473ca565ecab181e31a1.pdf

Perceptions of air quality significantly differ based on regional location. Specifically, a significantly larger proportion of adults in the Eastern Coachella Valley (39.4%) reported poor or fair air quality in their neighborhood compared to the Western Coachella Valley (18.9%), as illustrated in the figure below. These findings are somewhat expected given the Eastern Coachella Valley is geographically situated closer to the Salton Sea. Air pollution may also be more common the Eastern Coachella Valley given that there are more unpaved roads and agricultural fields here than in the west.

Figure 4. Air Quality Ratings by Region

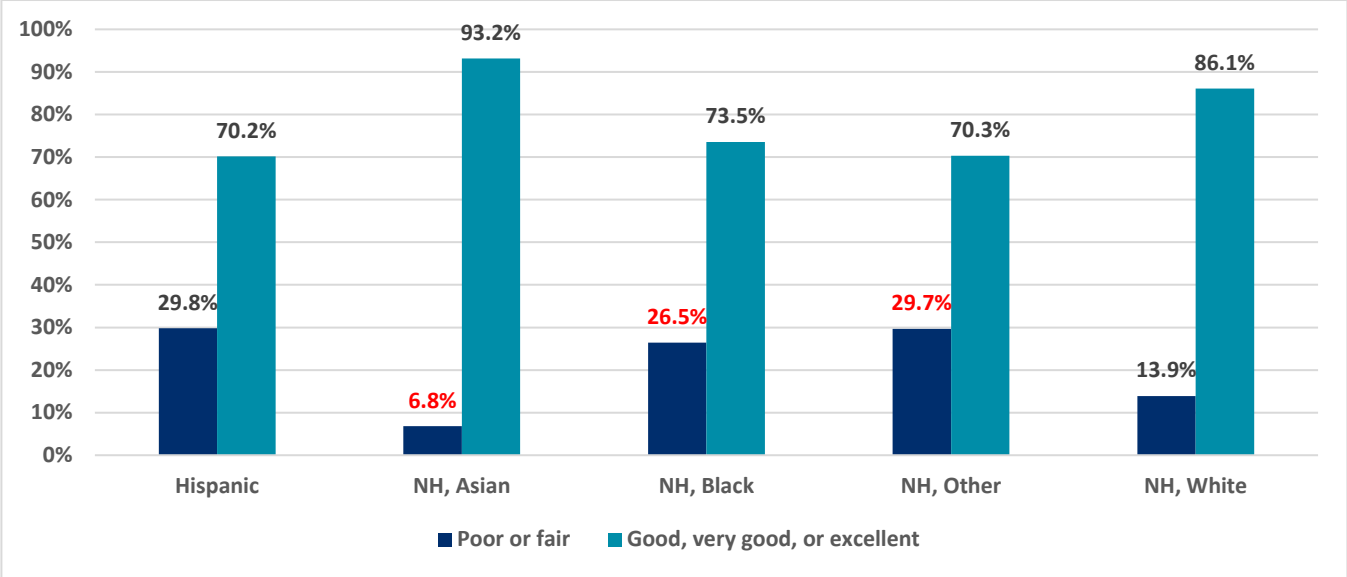


Note: East Valley, *n* = 43,325. West Valley, *n* = 293,647.

Race Crossed with Ethnicity

As illustrated in the figure below, perceptions of air quality slightly differ among race groups. Specifically, a significantly greater proportion of Hispanic adults reported poor or fair (29.8%) air quality compared to non-Hispanic, white adults (13.9%).

Figure 5. Air Quality Ratings by Race Crossed with Ethnicity

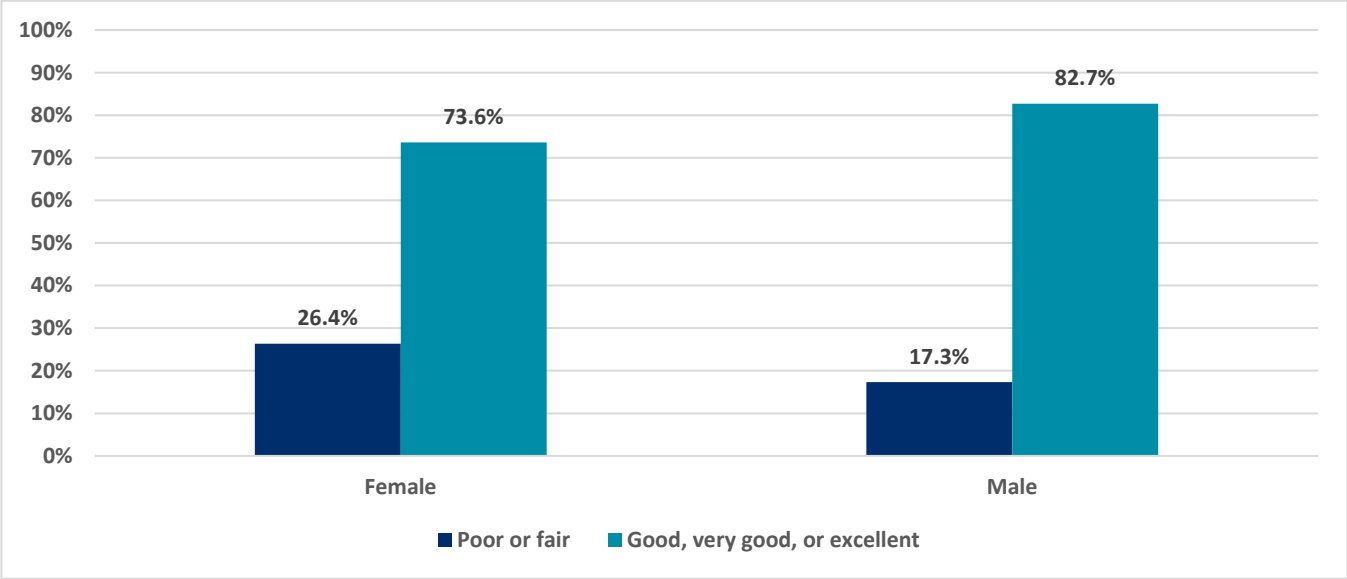


Note: Hispanic, *n* = 149,697. NH, Asian, *n* = 10,099. NH, Black, *n* = 7,694. NH, Other, *n* = 10,326. NH, White, *n* = 159,157.

Sex

Perceptions of poor air quality vary by sex. That is, a significantly higher proportion of females (26.4%) perceive air quality to be poor or fair, compared to males (17.3%).

Figure 6. Air Quality Ratings by Sex

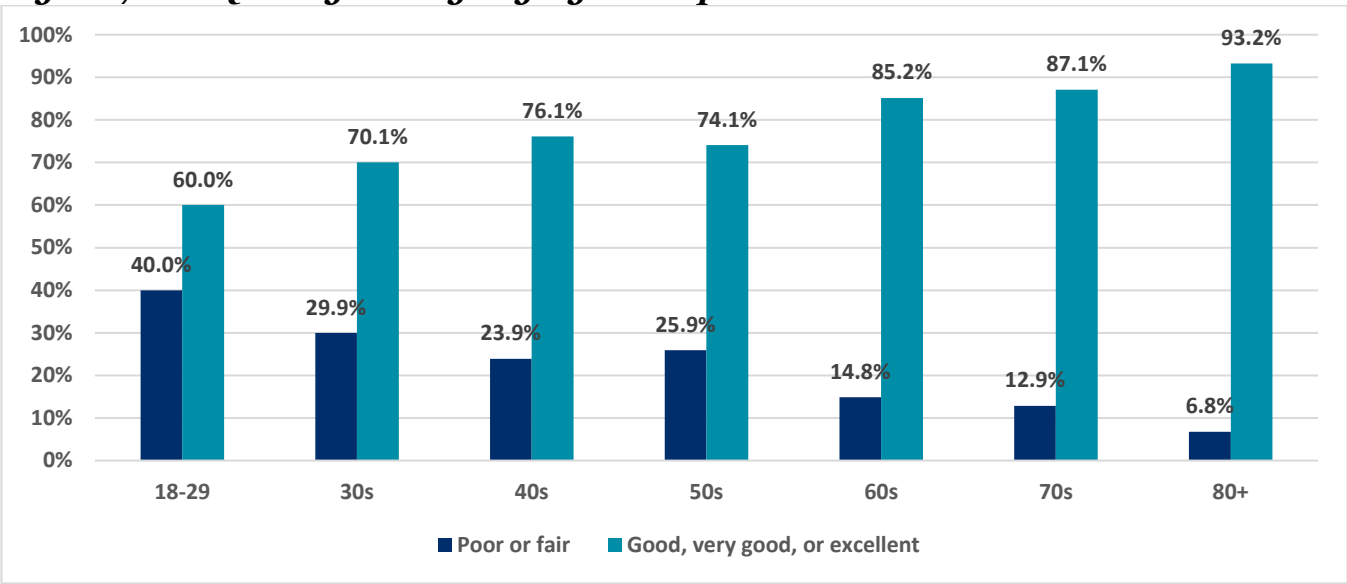


Note: Female, n = 157,037. Male, n = 179,935.

Age Group

Perceptions of air quality significantly differ based on age group, with younger ages tending to perceive lower quality air in their neighborhood, compared to older age groups (60s and older). Specifically, a significantly higher proportion of adults ages 18-29 (40.0%) perceive air quality to be poor or fair compared to those in their 60s (14.8%), 70s (12.9%), and 80s (6.8%). Likewise, a significantly higher proportion of adults in their 30s (29.9%) perceive air quality to be poor or fair compared to those in 70s (12.9%) and 80s (6.8%), and a significantly higher proportion of adults in their 40s (23.9%) perceive air quality to be poor or fair compared to those who are 80 years or older (6.8%). Lastly, a significantly higher proportion of those in their 50s (25.9%) perceive air quality to be poor or fair compared to those in their 60s (14.8%) and 70s (12.9%).

Figure 7. Air Quality Ratings by Age Group

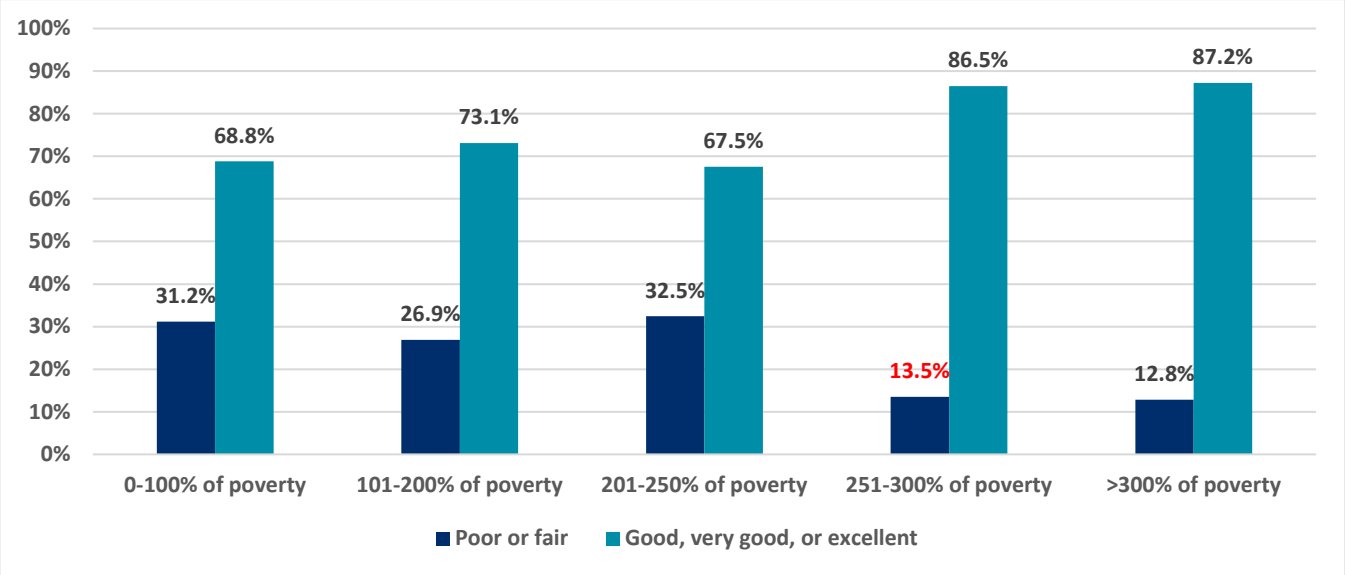


Note: 18-29, *n* = 24,283. 30s, *n* = 42,843. 40s, *n* = 44,861. 50s, *n* = 69,950. 60s, *n* = 65,667. 70s, *n* = 53,374. 80+, *n* = 26,332.

Poverty Level

Perceptions of air quality significantly differ based on poverty level classifications. Specifically, a significantly higher proportion of those living at 0-100% of the federal poverty line (FPL) (31.2%), 101-200% of FPL (26.9%), and 201-250% of FPL (12.8%) perceive air quality to be poor or fair compared to those living at more than 300% of federal poverty level (12.8%).

Figure 8. Air Quality Ratings by Federal Poverty Level

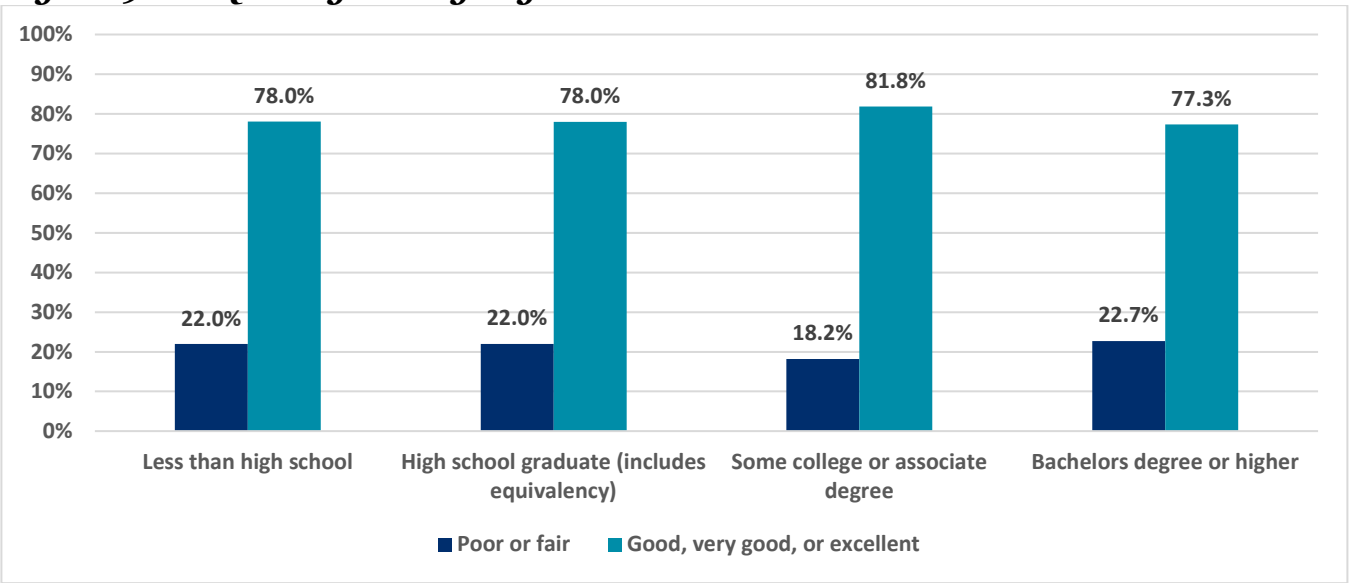


Note: 0-100% of poverty, n = 47,880. 101-200% of poverty, n = 56,924. 201-250% of poverty, n = 19,605. 251-300% of poverty, n = 14,423. More than 300% of poverty, n = 109,416.

Educational Attainment

As illustrated in the figure below, air quality perceptions do not vary significantly based on educational attainment. Approximately one-fifth of each category of educational attainment (i.e., less than high school, high school graduate, some college/associate, and bachelor's degree or higher) perceives air quality to be poor or fair in their neighborhood.

Figure 9. Air Quality Ratings by Educational Attainment

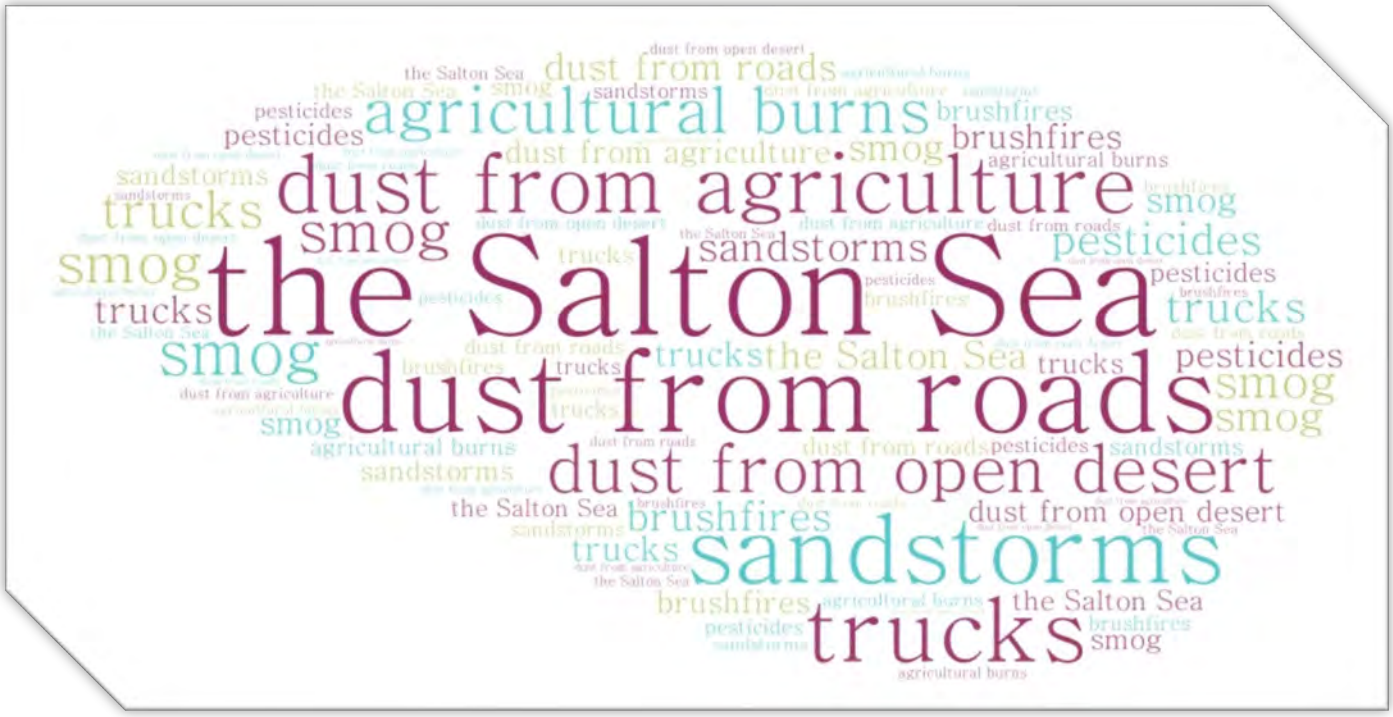


Note: Less than high school, n = 58,098. High school graduate, n = 91,969. Some college or associate degree, n = 78,664. Bachelor's degree or higher, n = 98,261.

Interview Results

In interviews, when prompted with the question on rating air quality, respondents referred to various sources of air pollution that are concentrated in the Eastern Coachella Valley. As illustrated below, these include dust from agricultural fields, the open desert, and unpaved roads; the Salton Sea; sandstorms; agricultural burns; pesticides; trucks; smog; and smoke from brushfires.

Figure 10. Interview Themes: Air Quality



Some also stressed the role of the region's strong winds, which mix and spread pollutants:

The air quality is worse because the wind, the flowers, the pollen, the dirt, the pesticides that they fumigate where we live—there are many parcels of chili, all these vegetables… and everything they produce here in the fields. We're not close [to the fields], but simply when the wind blows, everything is carried everywhere.
-Mecca resident

In addition, several respondents explained what "poor" air quality meant in terms of harm to one's health:

"The air quality in my neighborhood is always bad…. I speak for me, my family, my children or my nearby neighbors—always when they're outdoors, different things happen to them, whether it's internally, allergies or bodily reactions, things like that. No one explains why, but one knows that it's because you were outside of the house and you were outside for a bit, smelling the air. The air quality is not good to be outside for much time."
-North Shore resident

This participant continued by attesting to the effects of air quality on her child, reflecting a concern familiar to residents—childhood asthma:

“There are a lot of allergies, a lot of asthma. Also, they get another nose infection, sinusitis and many things. In my case, in my house I have a daughter who ever since she was one year old, she had asthma and allergies. She still suffers from all this. She can’t be outside for long, whether it’s cold or hot, for the same reason—the air quality.”
-North Shore resident

Another participant, who grew up in the Eastern Coachella Valley, reflected similar concerns:

“It's definitely noticeable [that] the air quality [in Mecca] is poor. At least my throat and my family's throat is always itching. Eyes are a bit watery. Your body will tell you the air quality [is poor] …. I've been in Palm Desert for a year now. Even though it's just like a 30-minute drive [from Mecca], there is a difference. I don't have as much allergies as I used to have.”
-Palm Desert resident

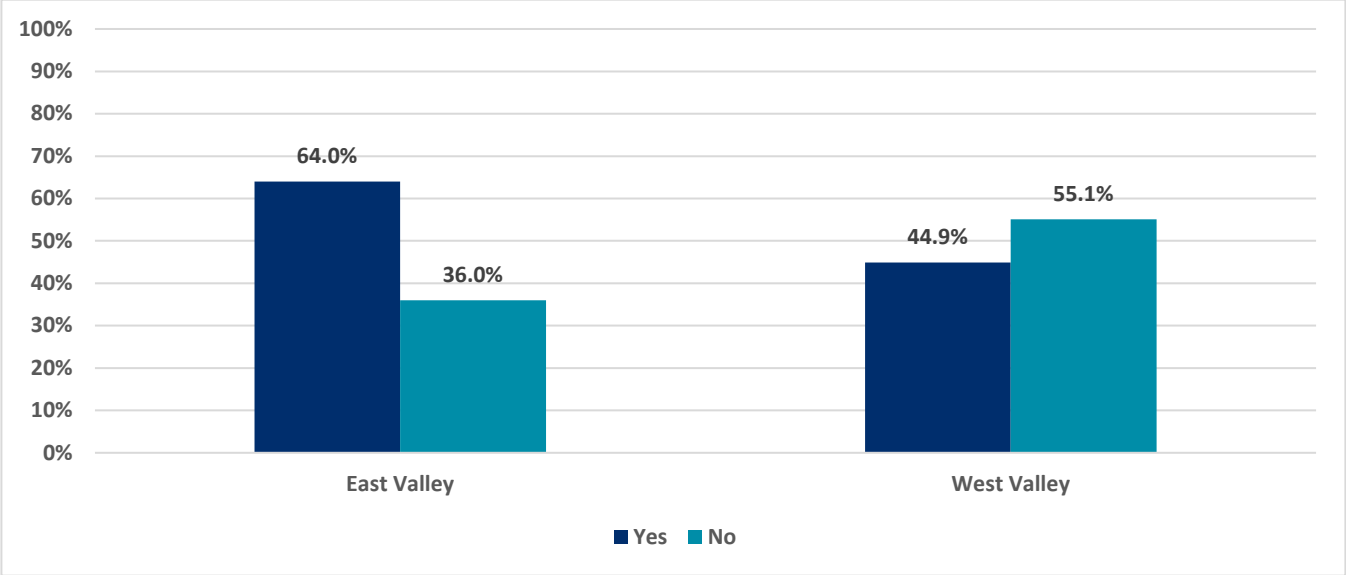
While a large majority of interview participants described their air quality as poor, a few described their air quality as “fine” and a few described it as being good on some days and sometimes poor on other days. While air pollution is nearly always a fluctuating state (dependent on, for example, temperature, air pressure, and wind patterns, in addition to sources of pollution), this is especially so in the Coachella Valley. In addition to the near constant sources of pollution such as local vehicles and smog from the Los Angeles basin, air quality can be dramatically worsened during either dust storms and odor events at the Salton Sea. Air quality concerns are thus both constant (e.g., dust from roadways and fields, pesticide drift, smog) as well as episodic (e.g., sandstorms and Salton Sea odor).

Outdoor Activities Inhibited by Poor Air Quality

Region

The data below highlights the varying impacts of air quality on outdoor activities across two regions, Eastern and Western Coachella Valley. A significantly higher percentage of respondents in the Eastern Coachella Valley reported that "yes," (64.0%) poor air quality has stopped them from outdoor activities, compared to the 44.9% in Western Coachella Valley who also stated yes.

Figure 11. Poor Air Quality Prevents Outdoor Activities by Region

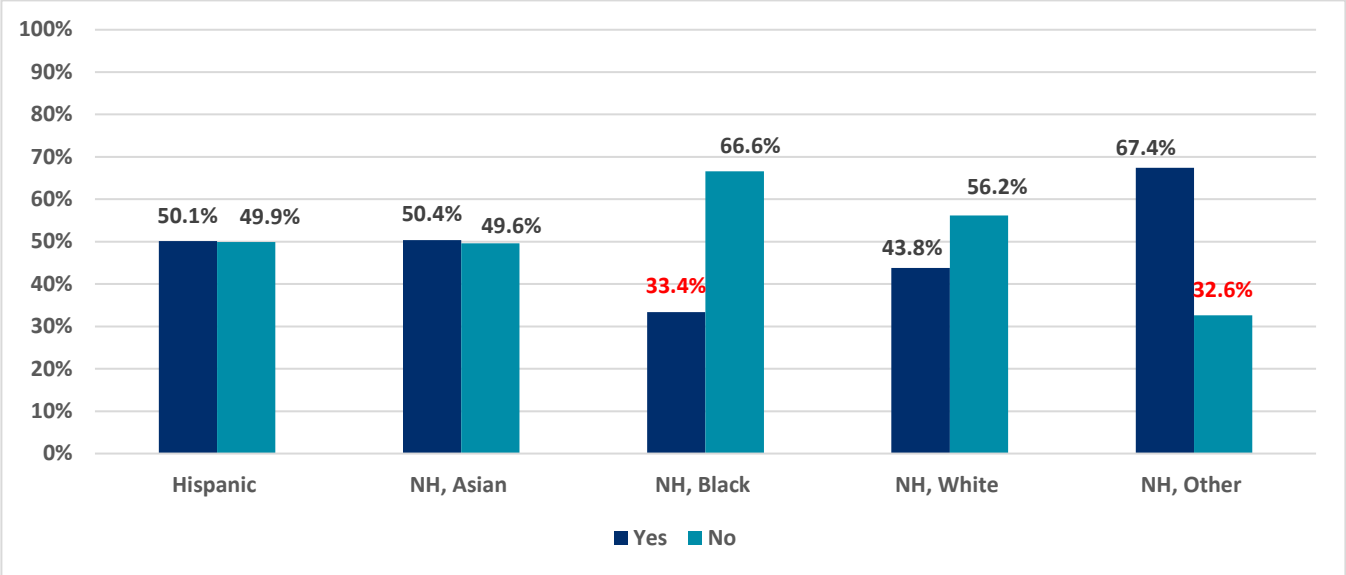


Note: East Valley, n = 38,413. West Valley, n = 258,801.

Race Crossed with Ethnicity

The impacts of poor air quality on outdoor activities does not vary significantly depending on the race crossed with ethnicity. However, a slightly greater proportion of Black adults (66.6%) reported that poor air quality does not inhibit them from doing outdoor activities in their neighborhood, in comparison to White adults (56.2%), Hispanic adults (49.9%), and Asians (49.6%). Thus, being inhibited by poor air quality is approximately similar across racial groups.

Figure 12. Poor Air Quality Prevents Outdoor Activities by Race and Ethnicity

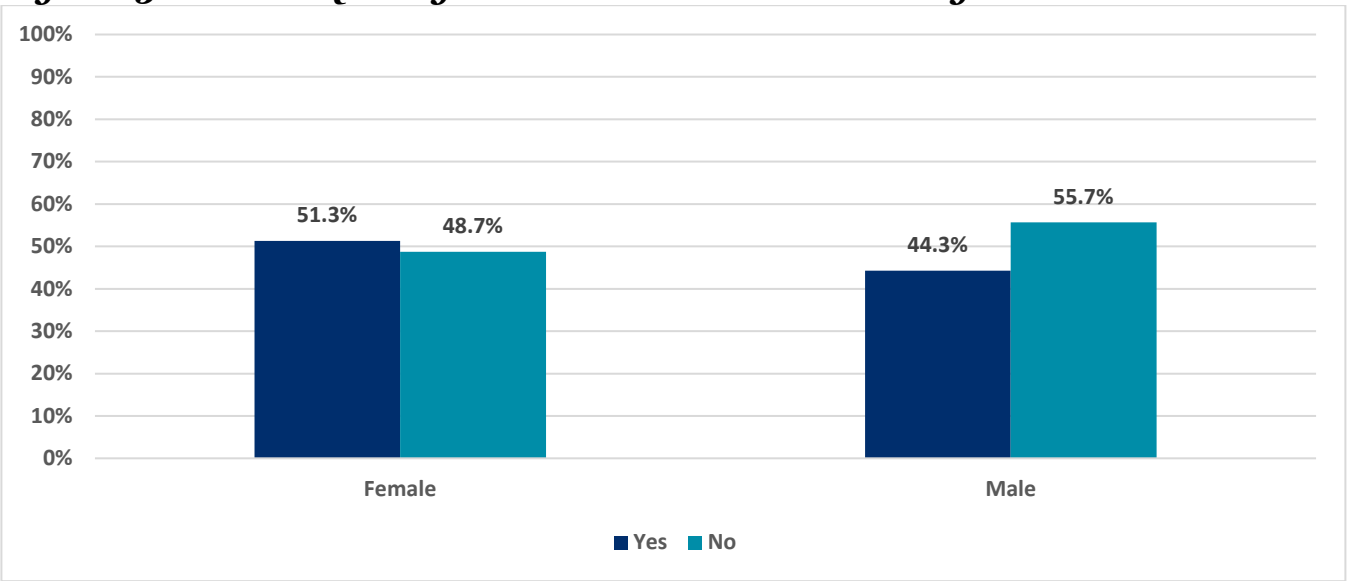


Note: Hispanic, *n* = 133,053. NH, Asian, *n* = 9,435. NH, Black, *n* = 4,898. NH, White, *n* = 140,739. NH, other, *n* = 9,089

Sex

The effect of poor air quality on outdoor activity shows to be non-significant by gender. A similar percentage of men and women reported that their outdoor activities are inhibited by poor air quality. Approximately 51.3% of women and 44.3% of men indicated that the air quality has an impact on their outdoor activities.

Figure 13. Poor Air Quality Prevents Outdoor Activities by Gender

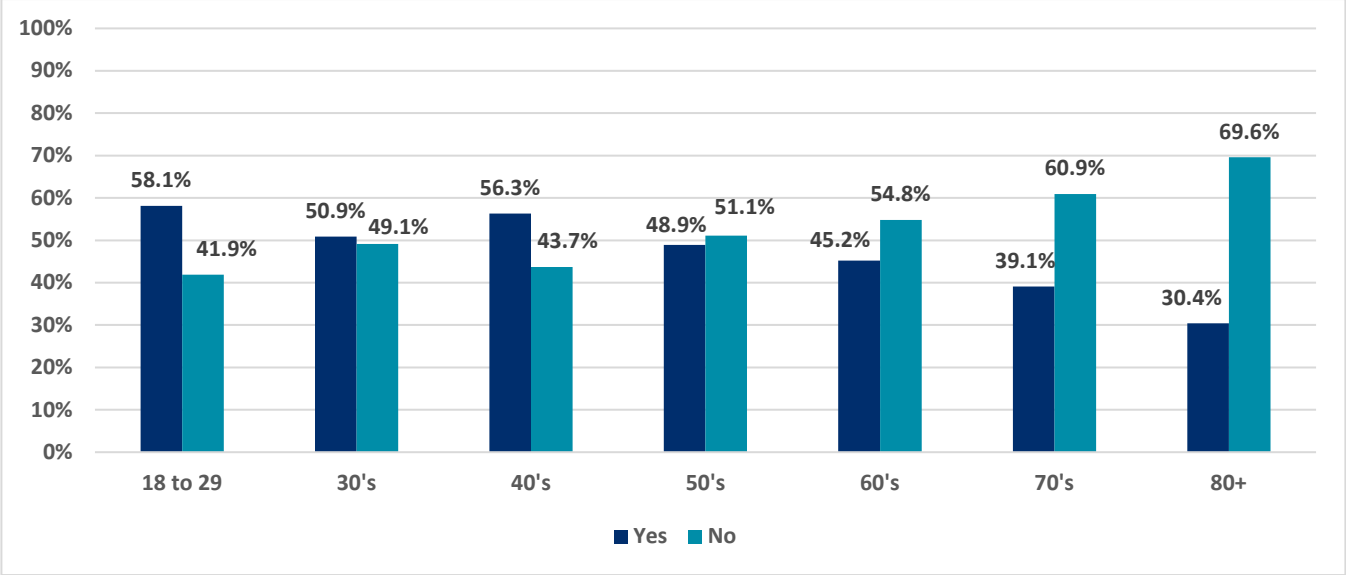


Note: Female, *n* = 132,878. Male, *n* = 164,336.

Age Group

There were some age differences when looking at the impact of air quality on outdoor activities. A significantly larger proportion of adults in their 40's (56.3%) and 50's (48.9%) reported that air quality impacts their outdoor activities in comparison to adults who are in their 80's (30.4%).

Figure 14. Poor Air Quality Prevents Outdoor Activities by Age

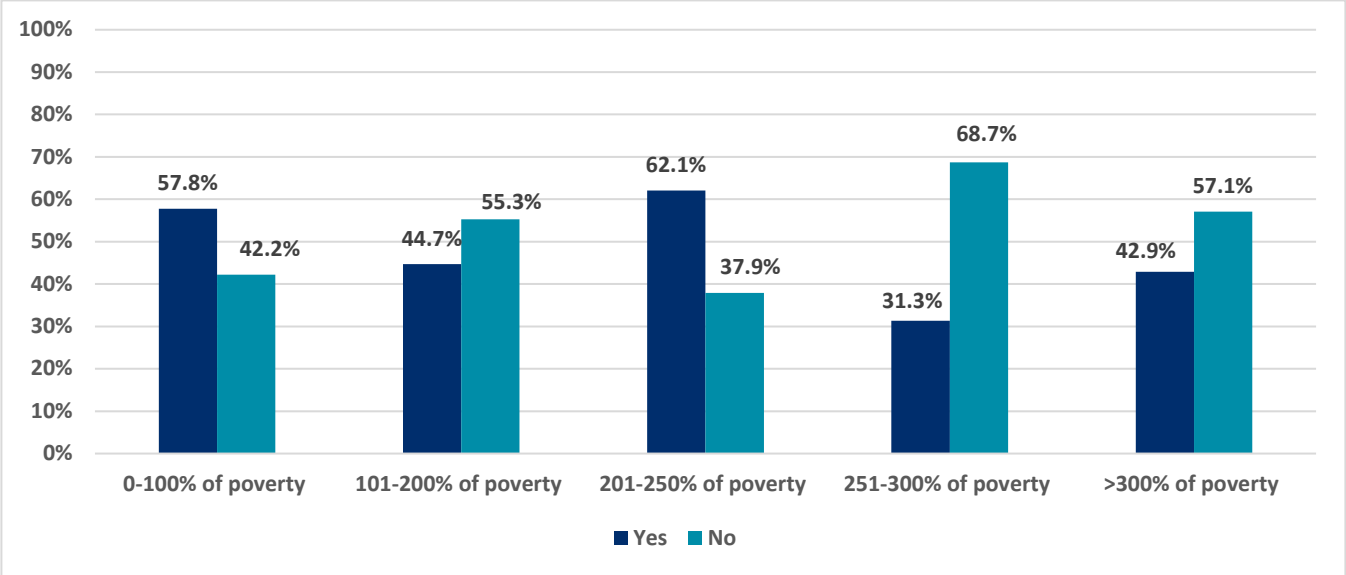


Note: 18 to 29, *n* = 21,507. 30's, *n* = 38,604. 40's, *n* = 39,258, 50's, *n* = 64,954. 60's, *n* = 56,308. 70's, *n* = 46,381. 80's, *n* = 22,349.

Poverty

No significant differences were observed between the poverty classifications and poor air quality preventing residents from outdoor activities. Despite this, higher proportions of those living at 0-100% of the federal poverty line (FPL) (57.8%), 101-200% of FPL (44.7%), and 201%-250% of FPL (62.1%) perceive poor air quality effects their outdoor activities compared to those living at more than 251-300% of the federal poverty line (31.3%).

Figure 15. Poor Air Quality Prevents Outdoor Activities by Federal Poverty Level

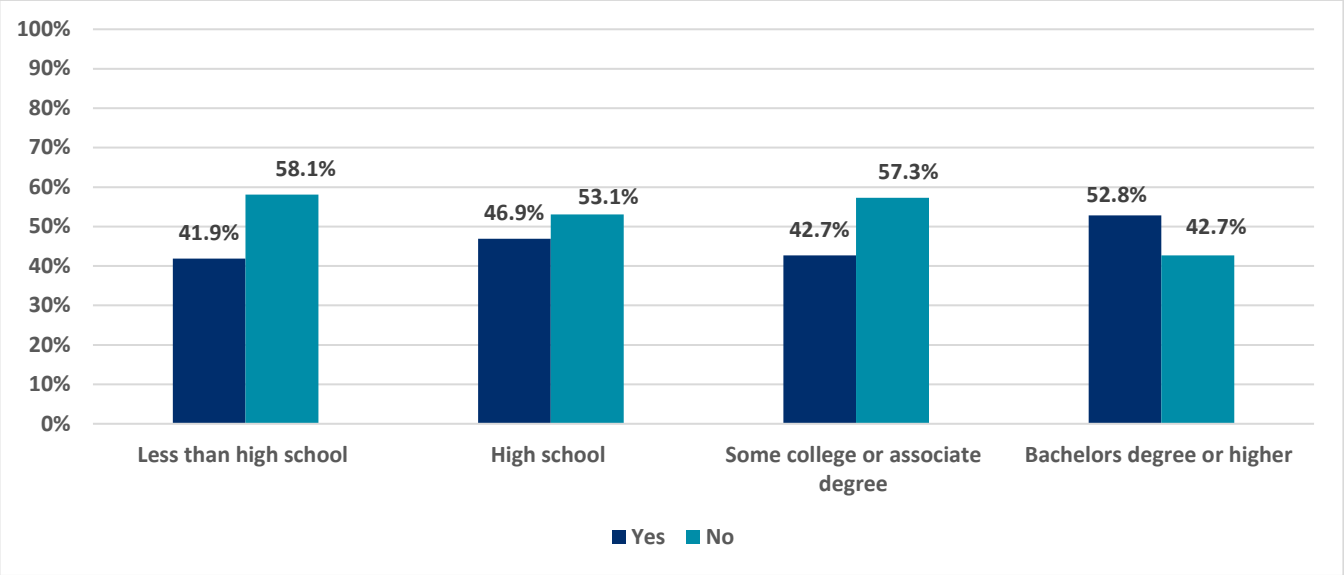


Note: 0-100% of poverty, *n* = 43,079. 101-200% of poverty, *n* = 49,714. 201-250% of poverty, *n* = 16,679. 251-200% of poverty, *n* = 12,386. >300% of poverty, *n* = 101,114.

Education

Educational attainment does not significantly vary by poor air quality inhibiting outdoor activities. That said, outdoor activities being impacted by poor air quality is approximately similar across the education levels.

Figure 16. Poor Air Quality Prevents Outdoor Activities by Education

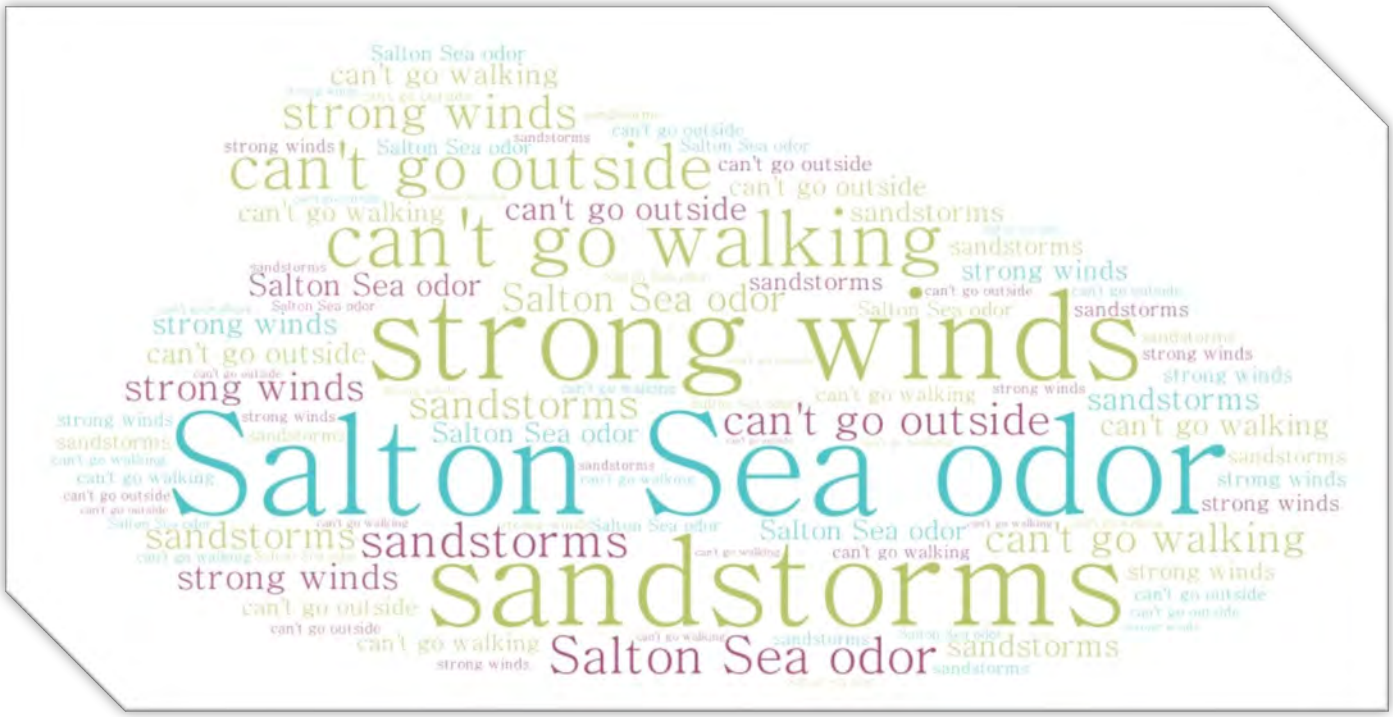


Note: Less than high school, n = 48679. High school graduates, n = 78,491. Some college or associate degree, n = 70,577. Bachelor's degree or higher, n = 92,211.

Interview Results

In interviews, when prompted with the question of whether air quality prevents outdoor activities, nearly all respondents explained how it prevents outdoor activity. As illustrated below, interviewees mentioned strong winds, sandstorms, or the Salton Sea odor, and many explained how such air quality issues prevent them from going on walks, hiking, or simply being outside.

Figure 17. Interview Themes: Outdoor Activity Inhibited by Poor Air Quality



Another respondent mentioned the Salton Sea odor:

"I love being outside [in my garden], but sometimes because of the weather or the air quality it's not possible…. Sometimes it's hot, it's windy, it's cold or it smells bad—the air smells bad. The air isn't good or it's humid, like that…. A humidity arises and it smells bad, it smells like rotten eggs."

-Mecca resident

This odor (attributed to the Salton Sea) is likely hydrogen sulfide gas, known for its sulfurous or "rotten eggs"-like smell. Such odor events can occur when summer thunder storms come into the valley and are notable especially when there is high humidity.

Another respondent mentioned the health effects of poor air quality as a cause of not being able to go outdoors:

"It stops me from going out—I'm trapped in my house for the same reason since because of my illness [asthma] I'm not able to have the luxury of going out when it's windy and there's a lot of dust and dirt, when there are strong gusts of wind—because of the dust and dirt, I'm not able to leave."

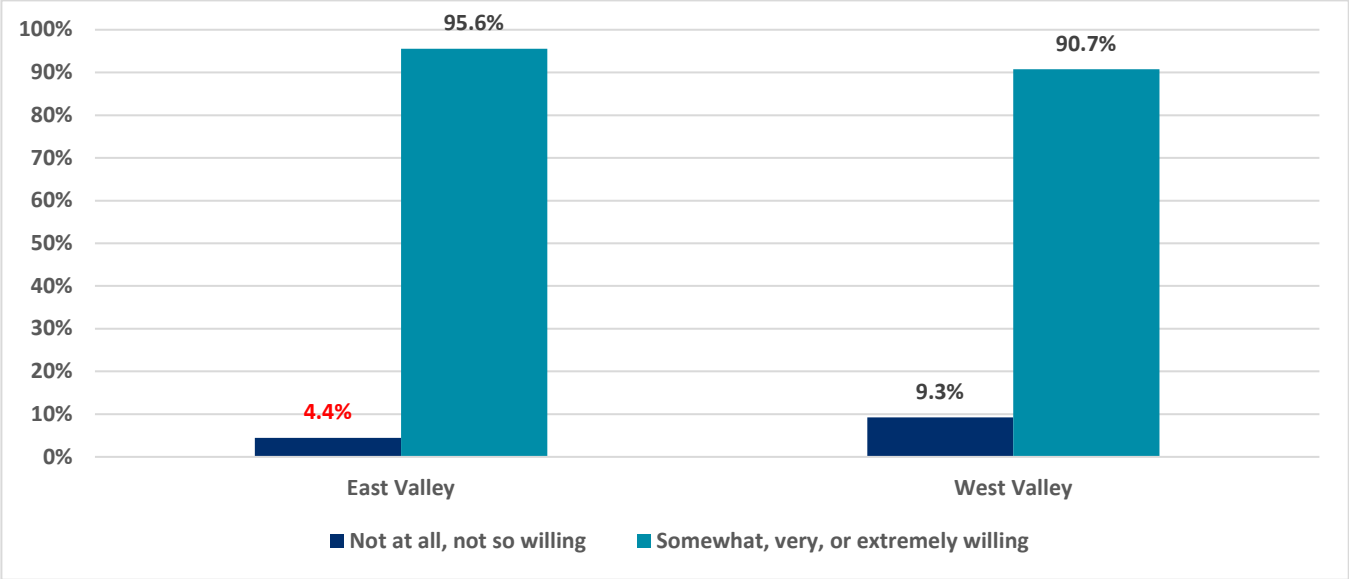
-North Shore resident

Willingness to Change Lifestyle

Region

As illustrated in the figure below, willingness to change lifestyle to reduce damage to the environment does significantly vary based on geographic region. More than 90% of Eastern Coachella Valley and Western Coachella Valley are willing to make changes to reduce damage to the environment.

Figure 18. Willingness to Change Lifestyle by Region

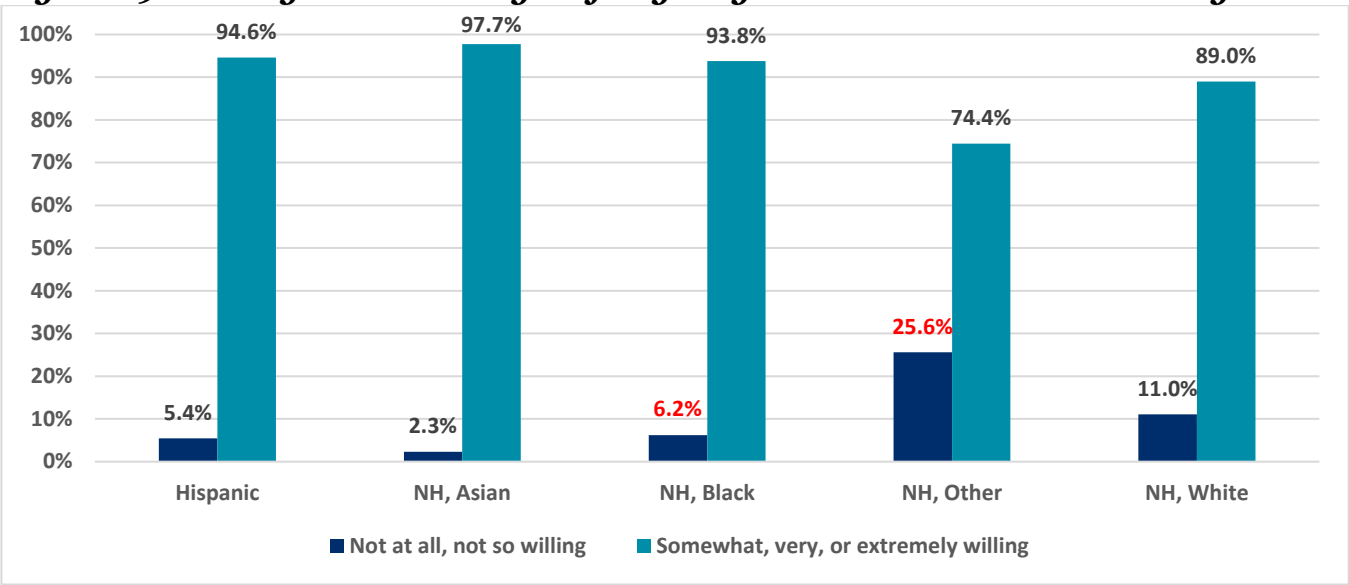


Note: East Valley, n = 42,960. West Valley, n = 288,433.

Race Crossed with Ethnicity

Willingness to change lifestyle to reduce damage to the environment varies significantly based on race crossed with ethnicity. Specifically, a significantly greater proportion of Hispanic adults (94.6%) report that they are somewhat, very, or extremely willing to change their lifestyle when compared to non-Hispanic, white adults (89.0%) and non-Hispanic, other races (74.4%).

Figure 19. Willingness to Change Lifestyle by Race Crossed with Ethnicity

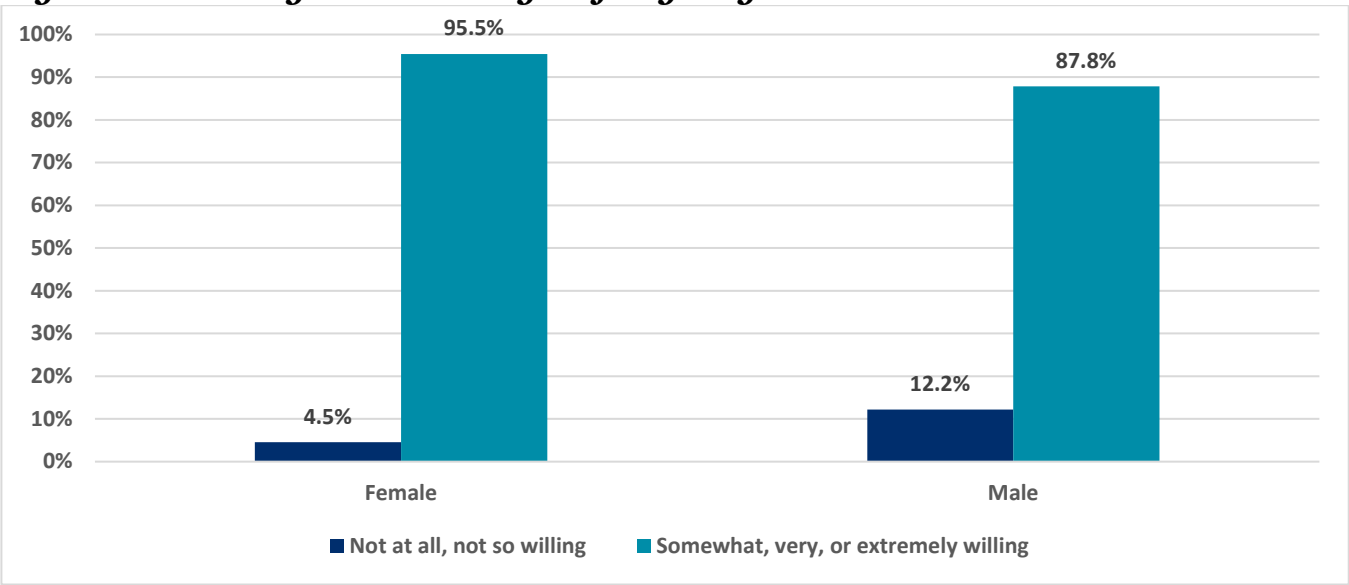


Note: Hispanic, *n* = 147,492. NH, Asian, *n* = 9,787. NH, Black, *n* = 6,929. NH, Other, *n* = 10,215. NH, White, *n* = 156,971.

Sex

Willingness to change lifestyle to reduce damage to the environment varies significantly based on sex. That is, a significantly greater proportion of females (95.5%) report that they are somewhat, very, or extremely willing (87.8%) to change their lifestyle to reduce damage to the environment.

Figure 20. Willingness to Change Lifestyle by Sex

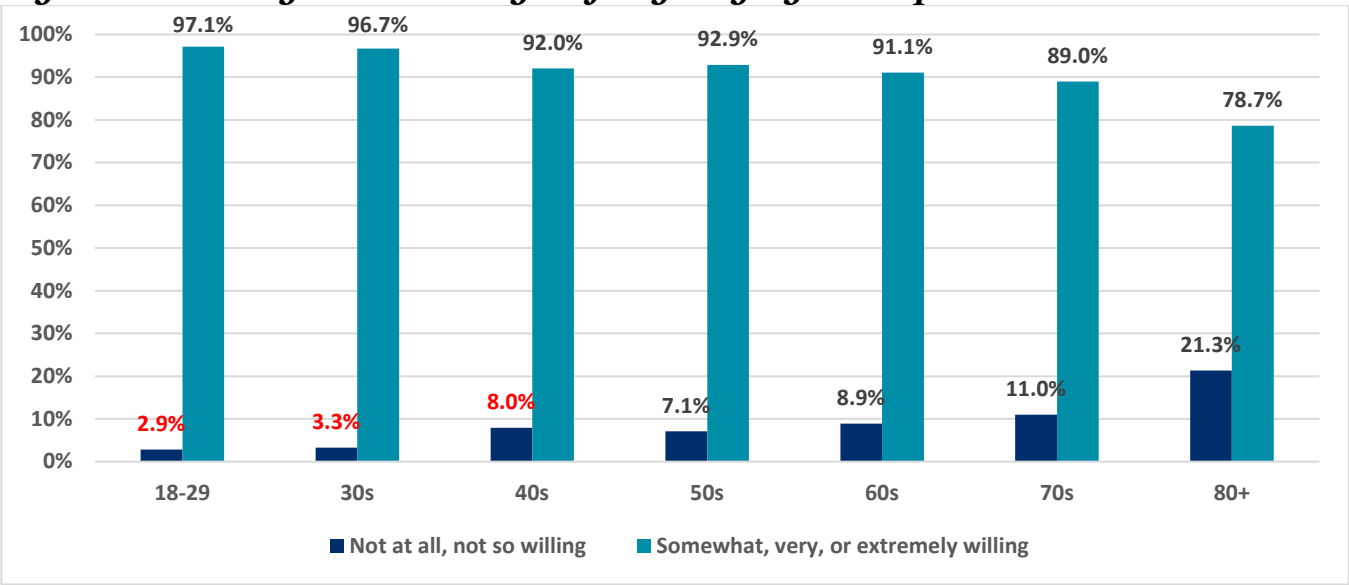


Note: Female, n = 153,544. Male, n = 177,849.

Age Group

Willingness to change lifestyle to reduce damage to the environment varies significantly by age group. Specifically, a significantly smaller proportion of those 80 years and older (78.7%) report that they are willing to make changes when compared to those in their 30s (96.7%), 50s (92.9%), and 60s (91.1%).

Figure 21. Willingness to Change Lifestyle by Age Group

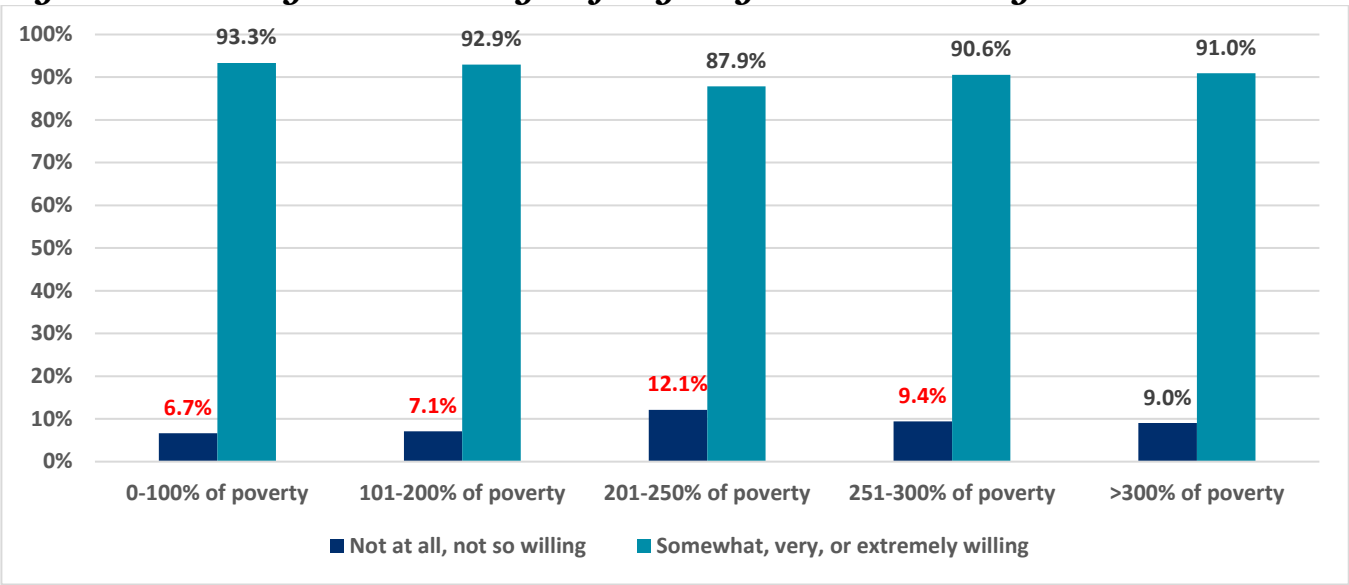


Note: 18-29, *n* = 24,283. 30s, *n* = 42,149. 40s, *n* = 44,861. 50s, *n* = 69,117. 60s, *n* = 64,946. 70s, *n* = 51,802. 80+, *n* = 25,811.

Federal Poverty Level

Willingness to change lifestyle to reduce damage to the environment does not significantly vary based on poverty level. Approximately 90% of adults of each category of poverty level report that they are somewhat, very, or extremely willing to make changes to reduce damage to the environment.

Figure 22. Willingness to Change Lifestyle by Federal Poverty Level

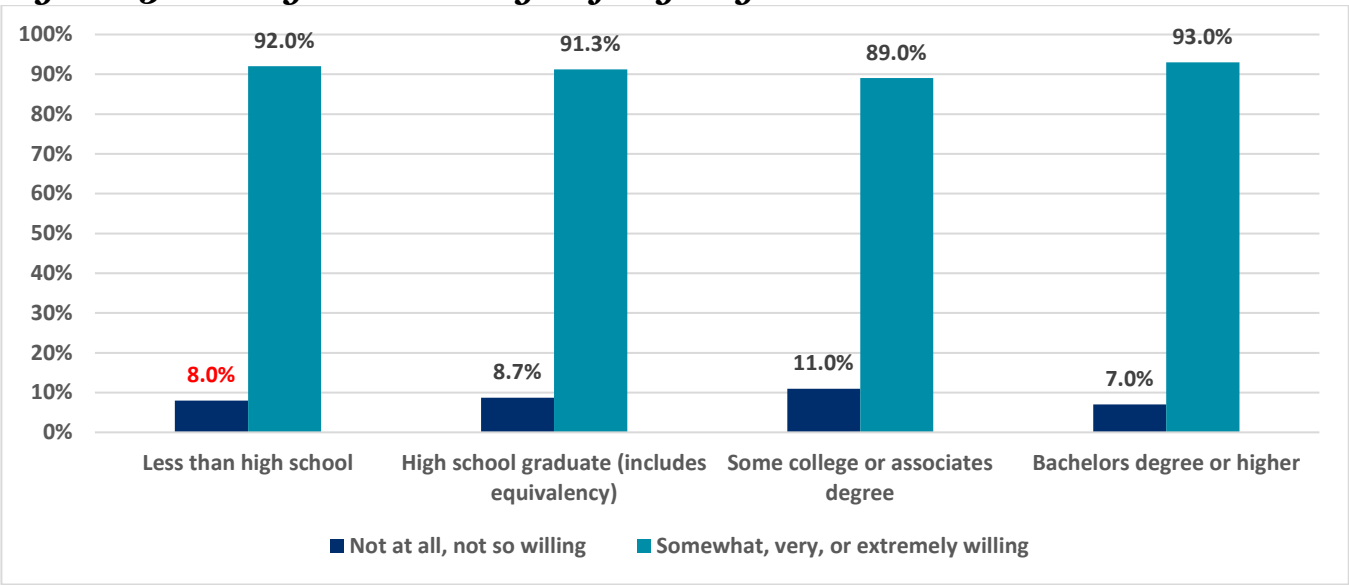


Note: 0-100% of poverty, *n* = 46,461. 101-200% of poverty, *n* = 56,825. 201-250% of poverty, *n* = 19,590. 251-300% of poverty, *n* = 14,390. More than 300% of poverty, *n* = 109,179.

Educational Attainment

Willingness to change lifestyle to reduce damage to the environment does not significantly vary based on educational attainment. Approximately 90% of adults at each level of education report that they are somewhat, very, or extremely willing to make changes to reduce damage to the environment.

Figure 23. Willingness to Change Lifestyle by Educational Attainment



Note: Less than high school, n = 56,568. High school graduate, n = 89,664. Some college or associate degree, n = 78,009. Bachelor's degree or higher, n = 97,422.

Interview Results

As mentioned in the Methods section, willingness to change lifestyle was not included in the interviews. Interviews focused on underserved communities rather than the general population (as with the survey). Instead, interviewees were asked what could be done generally to make positive changes to their environment (inviting responses about individual or collective changes).

As illustrated below, interviewees referred to political advocacy and government action, raising awareness, community organizing/volunteering, research, water conservation, and tree planting.

Figure 24. Interview Themes: How to Make Positive Environmental Changes

These responses reflected a willingness to change one's lifestyle (e.g., Many interviewees focused on collective effort:

"What can we do? Honestly, I think we just have to start taking action. The people need to voice their opinions to the right people, our city council or our mayor, things like that, and we need to call … attention to this. I think if we go together as a community, they can't ignore that, spreading awareness, spreading our concern."
-Thermal resident

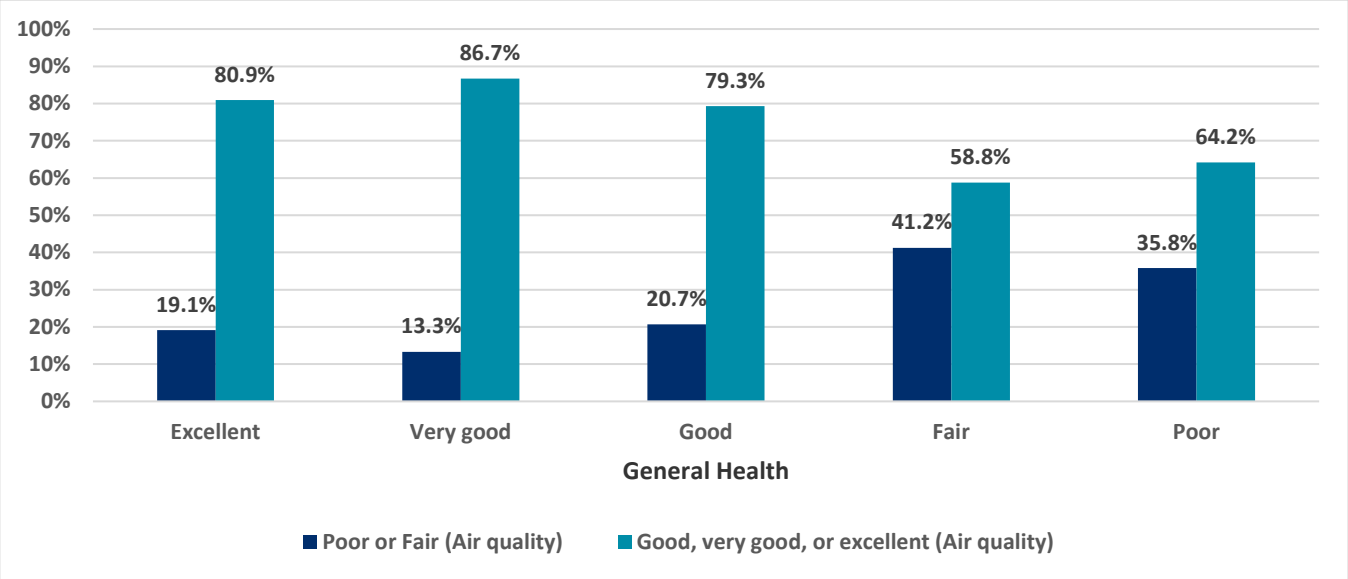
Air Quality Comparisons

Analyses are performed on statistically significant findings for other health-related information on residents living in the Coachella Valley. Specifically, we examine how perceptions of air quality vary based on general health status, experiences with racism, major diseases, weight and fitness, food insecurity, healthcare access, and COVID-19 financial impact.

General Health

Poor air quality ratings were significantly related to self-rated general health. A significantly higher proportion of respondents living with fair (41.2%) or poor (35.8%) general health reported having poor or fair air quality compared to those with excellent (19.1%), very good (13.3%), or good (20.7%) general health.

Figure 25. Air Quality Perception by General Health Ratings

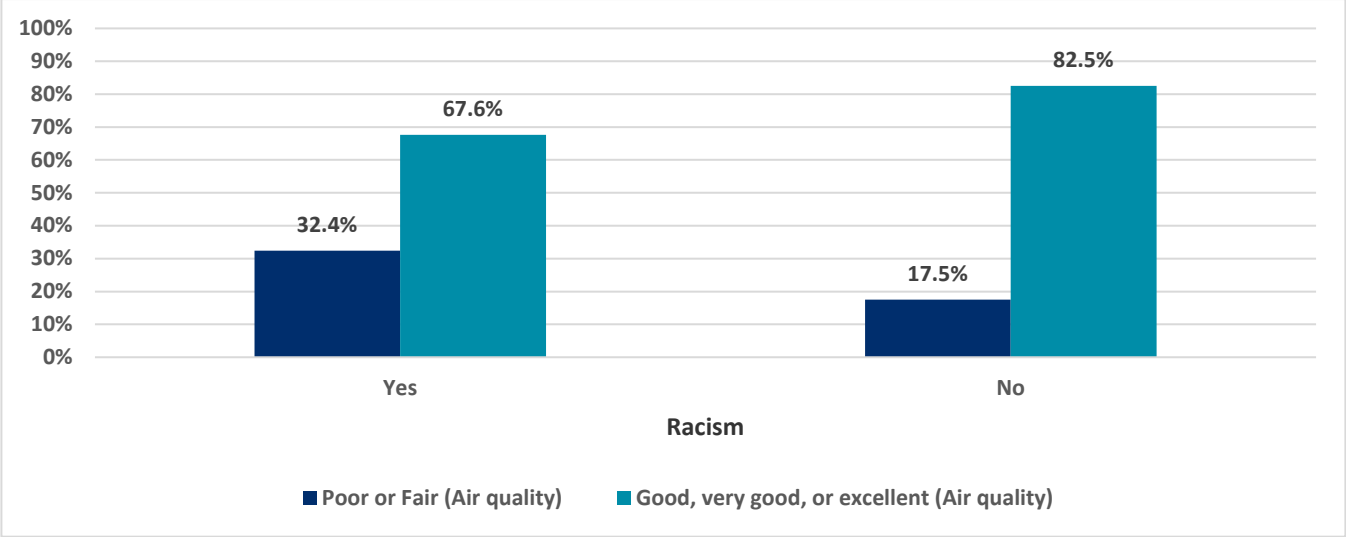


Note: Excellent, *n* =42,361. Very good, *n* = 98,682. Good, *n* = 130,041. Fair, *n* = 44,726. Poor, *n* = 10,346.

Racism

A significantly higher proportion of adults who have experienced racism (32.4%) report poor or fair air quality compared to those who have not (17.5%) experienced racism.

Figure 26. Air Quality Perception by Unfair Treatment Due to Race



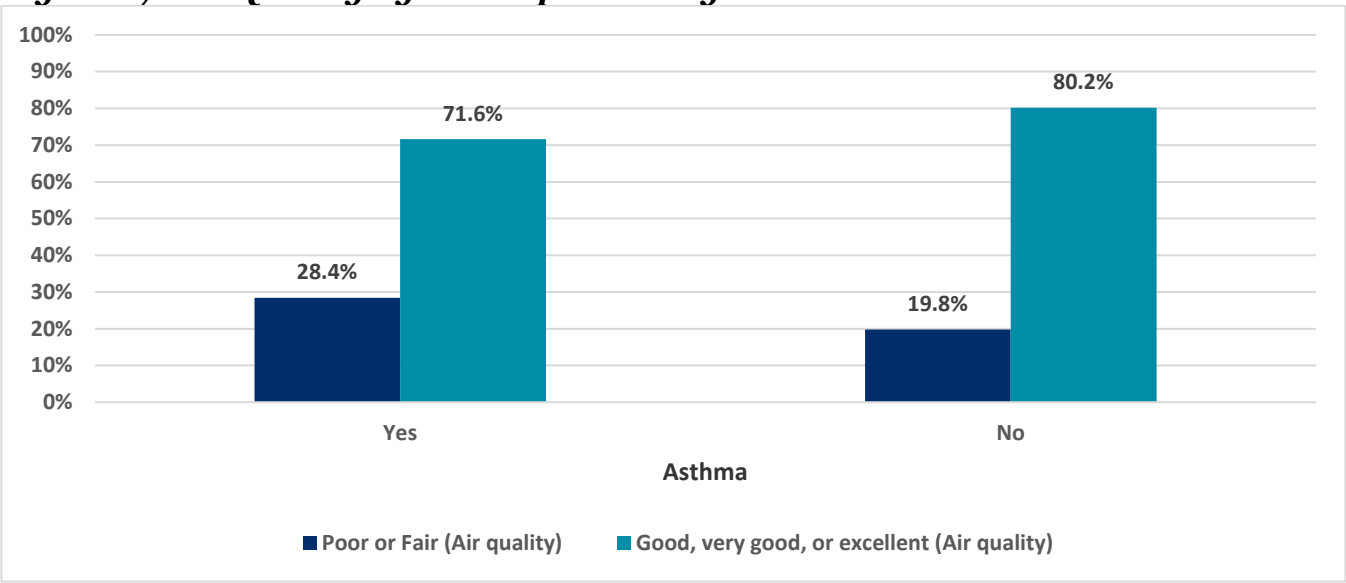
Note: Yes, *n* = 39,394. No, *n* = 255, 063.

Major Diseases

Asthma

Although participants who reported having asthma did not produce significant results, the data collected is highly related to air quality. That said, about 28.4% of those who have asthma also reported poor or fair air quality, whereas 19.8% of those with no asthma report poor or fair air quality. One possible explanation for the lack of significant results for air quality perception by asthma is that survey results recorded residents with an asthma *diagnosis*. It is possible that some residents indeed have asthma but might not have been diagnosed, and thus they were not included in the survey results.

Figure 27. Air Quality by Participants Diagnosed with Asthma

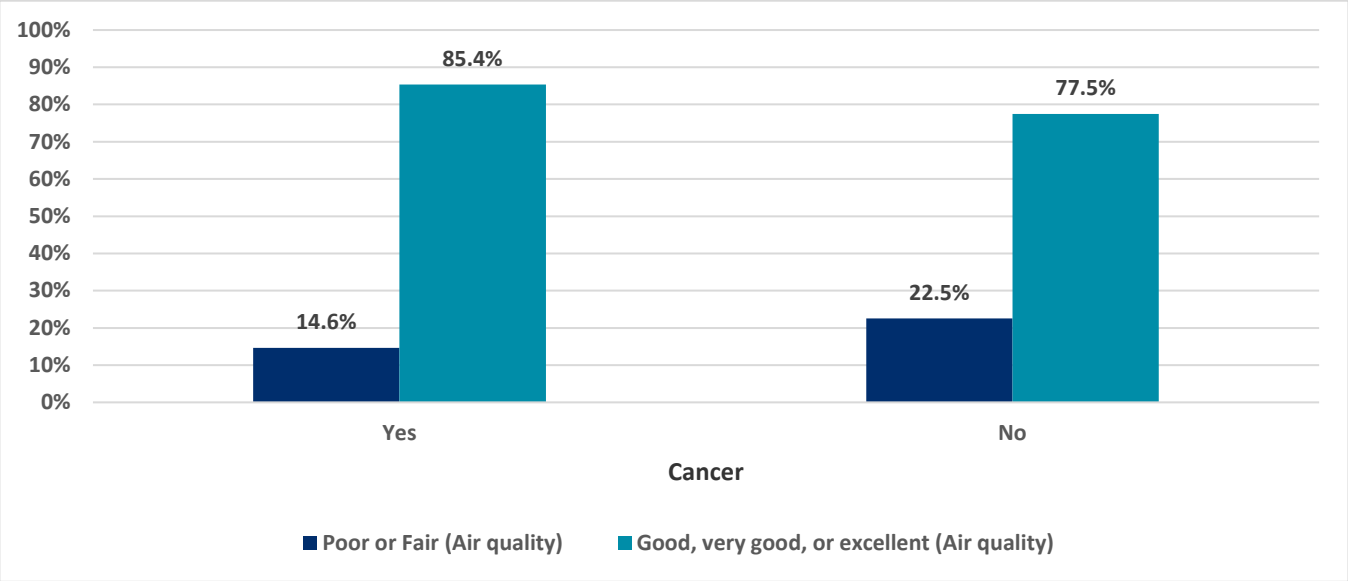


Note: Yes, *n* = 32,309. No, *n* = 259,609.

Cancer

A significantly smaller proportion of respondents (14.6%) who have had cancer perceive air quality to be low, compared to those who have not had cancer (22.5%)

Figure 28. Air Quality by Participants Having Cancer



Note: Yes, n = 49,200. No, n = 222,474.

Safe Place to Walk, Bike, or Hike in Neighborhood

A significantly larger proportion of respondents who say they do not have a safe place to walk, bike or hike in their neighborhood report poor or fair air quality (48.8%), compared to those who do have a safe place to walk, bike, or hike (17.0%).

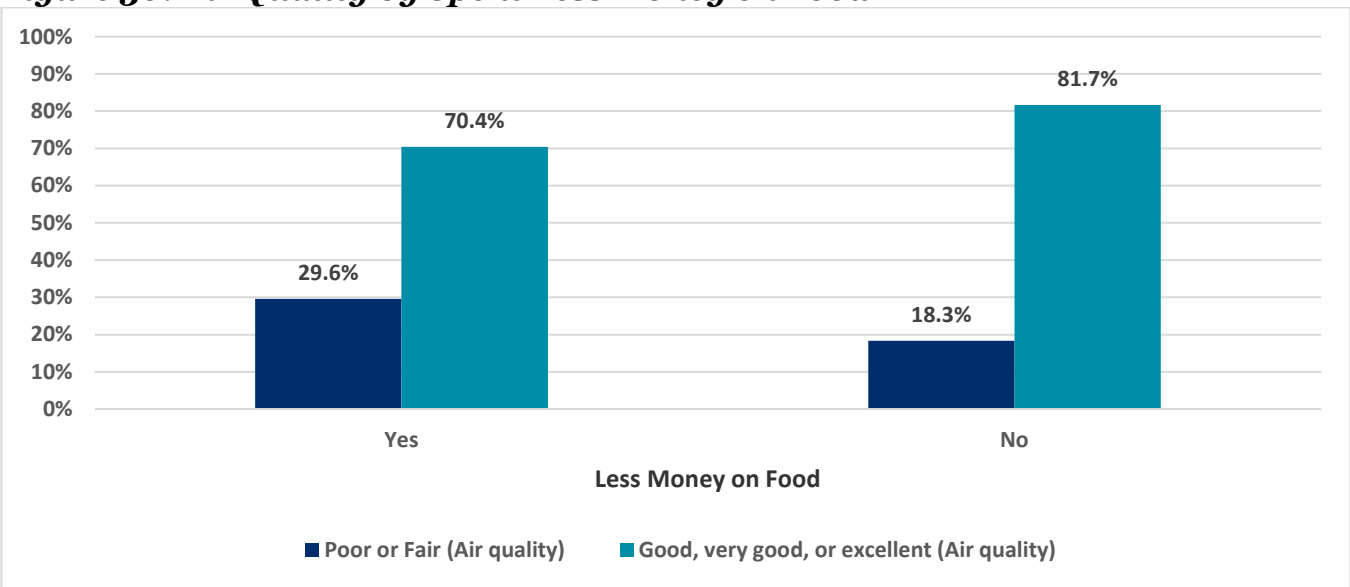
Figure 29. Air Quality by Having a Safe Place to Walk/Bike or Hike

Note: Yes, *n* = 285,879. No, *n* = 48,867.

Food Insecurity

A significantly higher proportion of respondents (29.6%) who spent less money on food to prioritize other basic needs perceive air quality to be low, compared to those who did not have to spend less money on food (18.3%).

Figure 30. Air Quality by Spent Less Money on Food

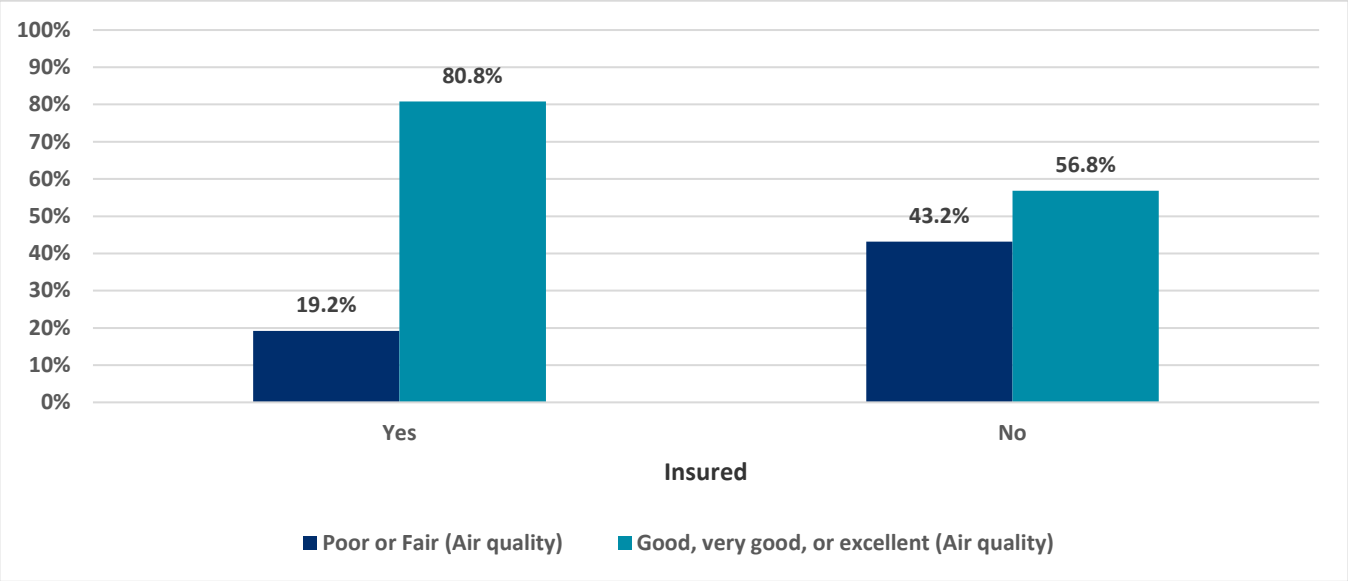


Note: Yes, *n* = 97,888. No, *n* = 238,184.

Healthcare Access

A significantly higher proportion of respondents (43.2%) with no health insurance coverage report poor or fair air quality compared to those who do have health insurance (19.2%).

Figure 31. Air Quality by Having Health Insurance



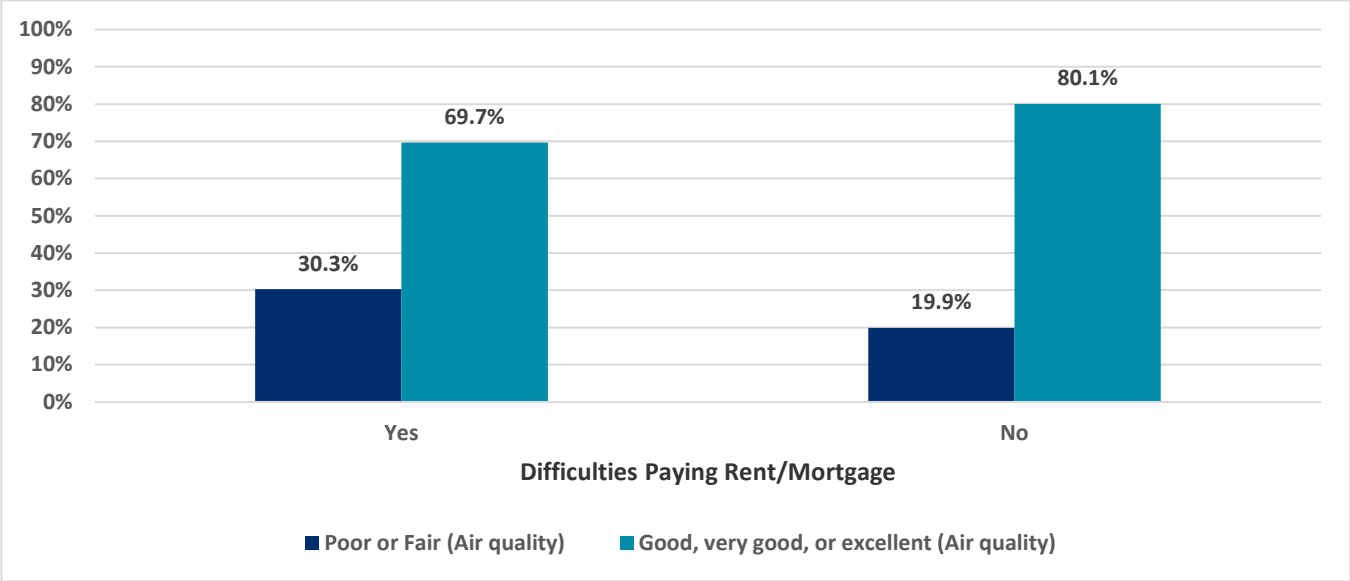
Note: Yes, n = 286,070. No, n = 26,730.

COVID-19

Experienced Financial Difficulties Paying Rent or Mortgage

A significantly higher proportion of respondents (30.3%) who reported experiencing financial difficulties due to COVID-19 in paying their rent/mortgage perceive air quality to be low, compared to those who did not experience these financial difficulties (19.9%).

Figure 32. Air Quality by COVID-19 Financial Difficulties Paying Rent/Mortgage

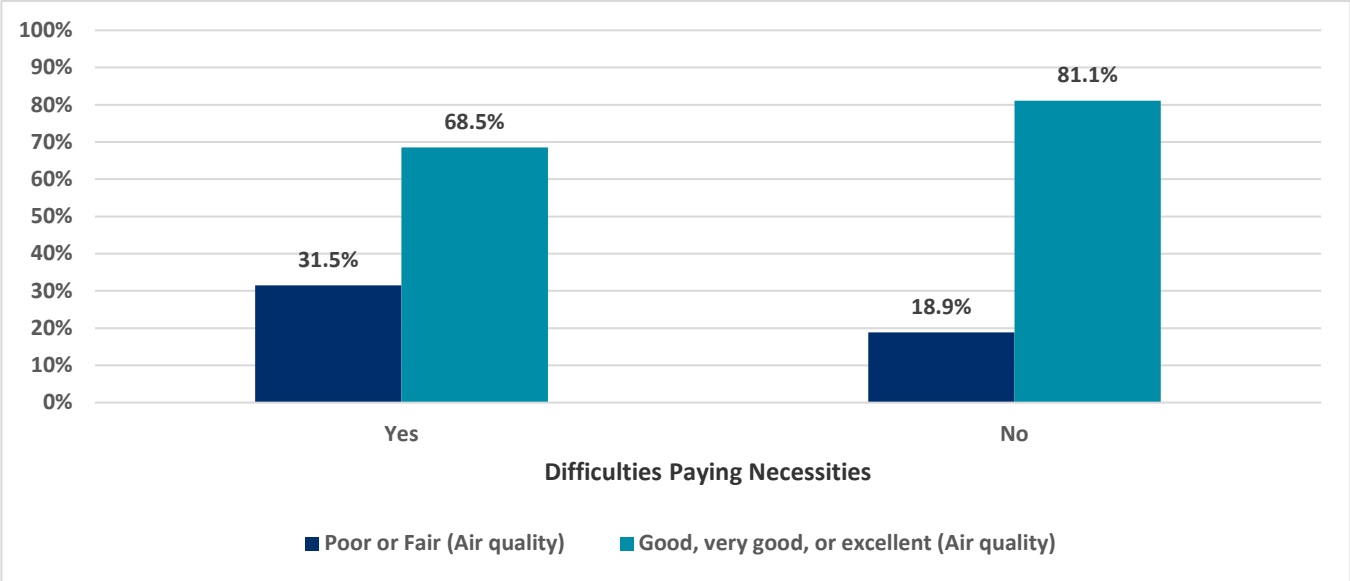


Note: Yes, n = 54,595. No, n = 262,736.

Experienced Difficulties with Paying for Necessities

A significantly higher proportion of respondents (31.5%) who reported experiencing financial difficulties due to COVID-19 in paying for basic necessities such as paying bills, tuition, affording groceries etc. perceive air quality to be low, compared to those who did not experience these financial difficulties (18.9%).

Figure 33. Air Quality by COVID-19 Financial Difficulties Paying for Necessities

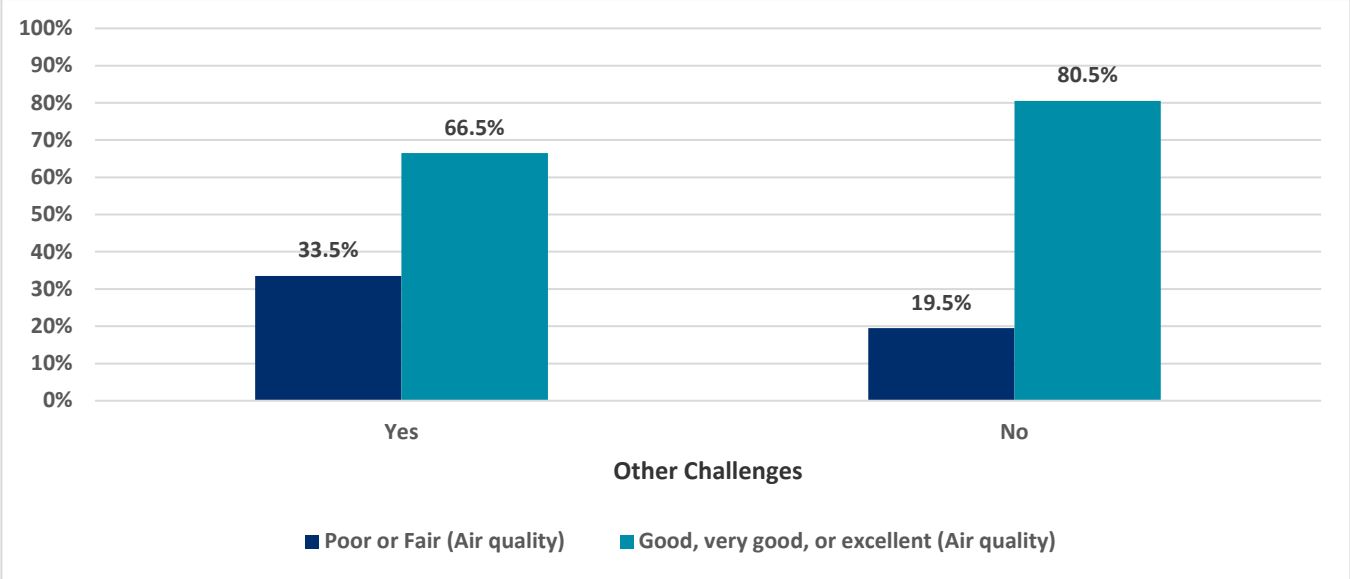


Note: Yes, n = 63,766. No, n = 253,910.

Experienced Other Challenges with COVID-19

A significantly higher proportion of respondents (33.5%) who reported experiencing other financial challenges due to COVID-19 perceive air quality to be low, compared to those who did not experience any other financial challenges (19.5%).

Figure 34. Air Quality by COVID-19 Other Challenges



Note: Yes, n = 22,125. No, n = 270,163.

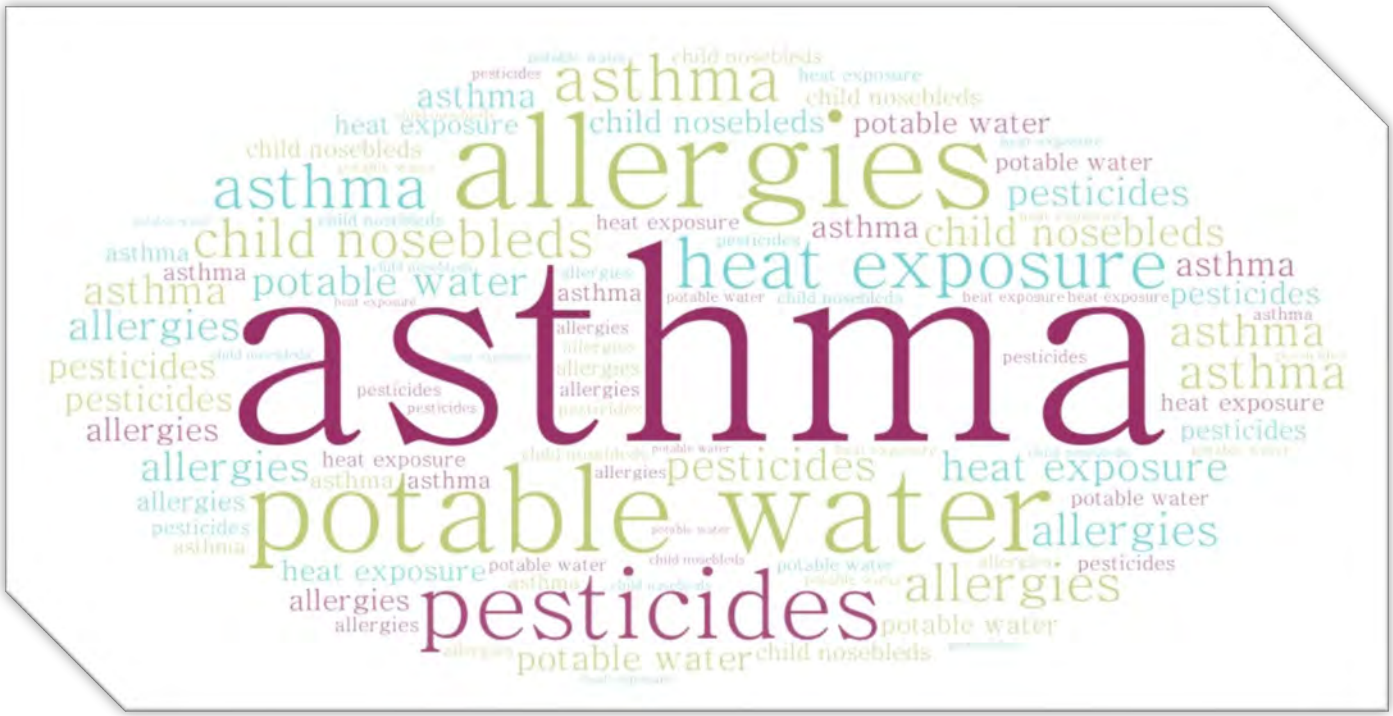
Environmental Opinions and Concerns of Residents

The interviews, in addition to exploring several of the topics addressed in the survey, also focused on topics beyond the scope of the survey data. As detailed in the interview results sections above, interviewees were asked about air quality, if air quality impedes outdoor activity, and what could be done to change one's local environment. As detailed below, interviewees were also asked about environmental health concerns, access to outdoor recreation, climate change, and observed changes in the environment over time. For a list of all interview questions, see the Appendix.

Environmental Health Concerns

Interview respondents, when asked about their environmental health concerns, mentioned conditions exacerbated by air quality as well as other concerns. As illustrated below, these included asthma, allergies, potable water, pesticides, child nosebleeds, and exposure to heat.

Figure 35. Interview Themes: Environmental Health Concerns



Potable Water

The tap water in trailer parks in the Eastern Coachella Valley has been shown to contain arsenic.[17] These trailer parks (locally known as Polanco Parks) are typically in disrepair and serve in effect as farm labor camps, where culturally and economically marginalized immigrant workers can find relatively affordable but poorly maintained housing.[18] One interviewee, although not a resident of a trailer park, expressed concern about their tap water:

"Even though there are people who say that the water is potable, we don't consume it. We have to be buying potable water to consume it. I was noticing that when the water isn't too good, it causes eczema, little spots on the skin. I have noticed that my baby develops many of these spots. This worries me—I would like to have a filter at my house because…. [never] have we sought [to determine] the water quality, but I imagine that it's a problem."
-North Shore resident

Another North Shore resident expressed a similar uncertainty about their water quality:

"Another [worry] also would be knowing if the water is potable, because it's as if we have potable water, but we don't know if it is 100% potable [or whether] it has arsenic or some other chemical, or some metal."
-North Shore resident

Another interviewee stressed the disparity between water quality in poorer and wealthier communities:

"I'm on the Torres Martinez [reservation]…. [Out] here, everyone gets their water delivered. Our sink water has high loads of arsenic, and they tell me like, 'You can't cook with that water. You can wash your dishes and wash your clothes with it, but you can't cook with it—don't drink it.' Everyone gets their water delivered…. I think that's ridiculous how there's a country club right next to us and they have all the clean water and we're right next to them and these people don't have [clean water]."
-Thermal resident

Pesticide Exposure

Another concern was the health impacts of pesticide exposure. The Eastern Coachella Valley has a large patchwork of agricultural fields, vineyards, and orchards. Some interviewees focused on the risk of working around pesticides for farmworkers:

"For me, I think more than anything there [should] be more control over pesticides…. I think that having more regulations over farms, because many times they fumigate when people are near. That shouldn't happen. That isn't right. I think [we need] more regulation [of] farms….. It would be ideal that they would fumigate when no one is nearby, in the afternoons, when people already leave, but no. Sometimes they do [fumigations] when people are working."
-Thermal resident

---

[17] Hile, Thomas D., et al. "Assessment of tap water quality in mobile homes in the Eastern Coachella Valley, California." PLOS Water 1.9 (2022): e0000037.
[18] There is a century-long history farm labor camps in California of being chronically dilapidated and in disrepair. See McWilliams, Carey. 1939. Factories in the Field: The Story of Migratory Farm Labor in California.

Another interviewee described such an incident, when a fellow worker was sprayed by pesticide while working:

"*In [working with] lemons, what endangers you a lot is when the top of the trees… has recently been fumigated. Once a lady almost fell from the ladder because she wouldn't stop [working]. I said to her, 'Hey, get down [from the ladder].' It's at the top of the trees where all the fumigation is, where they fumigate with the dust, and the lady coughed and coughed. I said to her, 'Get down—You're going to fall from the ladder.' She had to get down and she vomited, but we didn't complain—the lady didn't complain…. She vomited from coughing so much… That's the sort of thing that happens to us [when working in the fields].*"
-Mecca resident

Pesticide exposure presents greater harm than simply inducing coughing or vomiting. Evidence suggests that long-term pesticide exposure causes higher rates of cancer among farmworker populations.[19]

It is outside the scope of this study to determine whether state or federal laws regulating pesticide use have been or are being violated in the Eastern Coachella Valley. However, given the power differentials between laborers and landowners (e.g., immigration status, language ability, access to cultural capital, and access to economic resources), it is likely that worker safety violations in the agricultural sector are underreported and remain unaddressed.

While some interviewees stressed the impacts on farmworkers, another stressed that other residents are affected by pesticides:

"One of my worries is the chemicals that are here in the valley because of agriculture—they use many fertilizers, a lot of chemicals…. More than anything, my children go to school here… All this weather, all those chemicals—the dust carried by the wind—it also affects our children when they go to school. In fact, there's agriculture near the school… The chemicals don't only affect the workers, but also the children…. The wind carries the dust and … it gets to the schools. Whether you like it or not, one way or another, the dust gets there. When there are strong windstorms, it carries everything, [affecting] adults, children, everyone."
-North Shore resident

[19] Zahm, S. H., & Blair, A. (1993). Cancer among migrant and seasonal farmworkers: an epidemiologic review and research agenda. American Journal of Industrial Medicine, 24(6), 753-766; Mills, P. K., Dodge, J., & Yang, R. (2009). Cancer in migrant and seasonal hired farm workers. Journal of agromedicine, 14(2), 185-191; Mills, P. K., & Yang, R. C. (2007). Agricultural exposures and gastric cancer risk in Hispanic farm workers in California. Environmental research, 104(2), 282-289.

Access to Outdoor Recreation

Interviewees were also asked how to make outdoor recreation more accessible to underserved communities. This would include recreation such as hiking, camping, or taking walks. As illustrated below, many residents mentioned barriers to accessing outdoor spaces, such as a lack of adequate parks, long distances to outdoor recreation areas, a lack of adequate transportation, the high cost of entrance fees, a lack of awareness, and a lack of free time from work.

Figure 36. Interview Themes: Access to Outdoor Recreation

For some interviewees, their neighborhood park was a primary site for outdoor recreation. Some interviewees mentioned the need for larger or more parks:

"Another park, I think, [is needed]. We have a park here, but there are a lot of people that live here where we are living. Sometimes the park there is full, and because of that, we don't go because there are so many people. We don't go out."
-Thermal resident

Others focused less on accessibility and more on the quality of outdoor spaces. While verdant landscaping is abundant in the Western Coachella Valley, such landscaping is less common in the Eastern Coachella Valley. Some interviewees emphasized the need for trees and green spaces:

"[I like] walking, planting more trees, going bike riding—[I wish] there were more things to do outside. There's a park, but it needs more greenery, planting more trees…. [because] trees serve as the lungs of the Earth—they clean the air. In fact, they purify the air more, and we'd have cleaner air….
-North Shore resident

Others stressed that even though there are natural places available for recreation (such as large parks or preserves), some interviewees simply were not raised with the idea of hiking or camping as being an option. One interviewee shared how, as a child, such activities were largely unknown to her working-class household:

"I am able to spend time in nature for recreation, but I don't think my family is able to. I don't think a lot of my community members are able to…. [Growing] up, it wasn't something that I experienced. I grew up in Mecca, and I was raised by my grandparents, and that was never something that I heard them talk about having experienced…. Now, as an adult, I do venture out to Mecca Hills, and now to Joshua Tree, Whitewater [Preserve], but growing up, that wasn't something that we ever discussed."
-Indio resident

In addition to this cultural barrier, some interviewees spoke of economic barriers to outdoor recreation, such as entrance fees and the cost of driving far distances. Some also stressed restrictions on people's free time and physical capacity, especially for farmworkers who, during harvest season, might work six-day work weeks in hard manual labor. The same resident quoted above explained this further:

"[My family] labored in the fields. I think that's where most of their energy and time went into. I think there's an added expense of having to drive out somewhere…. [Growing] up low income, I think, … changes a lot of our experiences. Then because they labor outdoors, their connection to outdoor spaces is different. They're like, 'That's work. I do that already. I labor.' Their connection to outdoor spaces isn't—Their perception of it isn't something that they can enjoy for relaxation or grounding purposes. To them it's labor."
-Indio resident

Another interviewee, themself a farmworker, reflected a similar view, that the demands of work restricted one's ability to set aside time for leisure:

"The truth is, no, [you're not able to spend time in nature for recreation]. You leave for work and you come home late from working and you're making dinner, and [you're] with the children, and what needs to be done, and it's like that. No, no more than 15 minutes [of free time] in the evening, [taking a walk] here along the road."
-North Shore resident

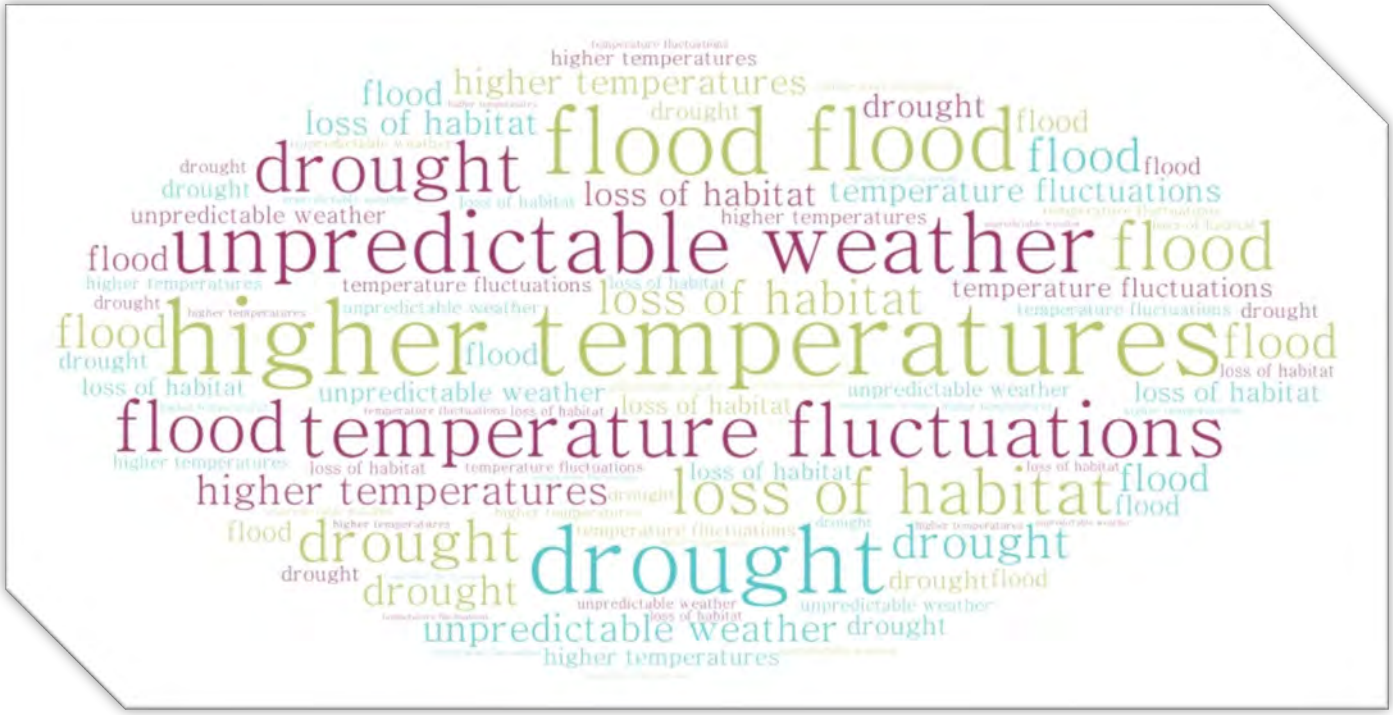
Such barriers highlight the need for efforts that proactively seek to include underserved communities in outdoor spaces and recreational activities. These efforts might include non-profits that hold special events (such as for the annual Latino Conservation Week) or that run educational outreach programs (such as the local Nuestro Desierto Program[20]). This need for outreach was highlighted by an interviewee:

"I [like] the work that a lot of orgs are currently doing … where they're providing opportunities to take folks out to different areas. I've joined [one of these organizations] on a few trips…. They provide transportation, meals. I think for some of their programs they're starting to provide hiking gear…. [Throughout] the process they're informing, they're educating, and they're providing the experience and the resources, the tools. I think when you make it that easy for folks to step into it, that's a learning opportunity."
-Indio resident

Climate Change

Interviewees were also asked about their opinions regarding climate change. Most expressed concerns about climate change's local impacts, such as temperature fluctuations, loss of habitat, drought, floods, unpredictable weather, or higher temperatures.

Figure 37. Interview Themes: Climate Change



[20] This program, in its second year as of this writing, is run by COFEM, UCR Palm Desert, and the Cactus-to-Clouds Institute. Its goal is to provide environmental education to working-class Hispanic youth from the Coachella Valley.

One resident, who was raised in Mecca, described climate change as a serious, all-encompassing challenge:

"I think it's very serious for my community and for our society and the world. It's probably… the most important issue we have right now. Climate change—it's definitely been affecting how we live our lives, and it's going to change how we eat, how we spend time outdoors, how we interact with each other, and everything. Everything that we know is going to change."
-Palm Desert resident

Another interviewee stressed the inequities of climate impacts for those who work outdoors or have inadequate housing:

"I think low-income folks are those that are experiencing [climate change] firsthand. They're the first to experience everything because they're exposed to the environment…. When temperatures hit 120 degrees and they're living in dilapidated [trailer parks]. Whenever there's sandstorms, they're exposed to that. They feel every change in the environment whereas those that are living on the [western side of the valley] are a little bit more protected in their luxury homes and they visit the valley as a vacation getaway, their oasis in the desert, but those who live and labor here are experiencing all of the harsh environmental conditions…. There's really no escaping it. They work in those conditions and then they live in those conditions."
-Indio resident

Observed Changes Over Time

Interviewees were also asked about changes they have observed in their environment and what changes they would like to see. Many interviewees have lived in their community for a decade or longer, some for their whole lives. Observed environmental changes over time included higher temperatures, more development/gentrification, more flying insects, the shrinking of the Salton Sea, population increase, more trash along the road, more brush fires, and more children getting sick.

Figure 38. Interview Themes: Observed Changes Over Time

Some interviewees, who regularly work outside, spoke of the valley's increasing temperatures:

"I have lived here for 16 years…. The climate that I have seen is—I don't know. I feel that it's been getting hotter. Every day it gets hotter, and every year it gets worse with the flies at the [Salton Sea]. The truth is, every year it gets worse."
-North Shore resident

Some explained that there have been increasing swarms of "flies" near the Salton Sea. These are likely the insect known as water boatman (family Corixidae),[21] which use the Salton Sea as a habitat. Although harmless, the insects are a nuisance,[22] swarming over cars and producing unpleasant odors:

"In the hot part of the year, if the odor [of the Salton Sea] is strong and then the flies began to come out, which get into the air [ducts] of cars…. Yes, the flies appear when it's humid. The car air filters fill with them. As much as you clean it, they don't stop."
-North Shore resident

[21] Britannica, The Editors of Encyclopaedia. "Water boatman". Encyclopedia Britannica, https://www.britannica.com/animal/water-boatman. Accessed 25 July 2023.
[22] "Water Boatmen are Back." *Borrego Sun*. https://www.borregosun.com/story/2019/08/01/news/water-boatmen-are-back/5130.html. Accessed 25 July 2023.

Another interviewee emphasized urban development as a major change, tied to the rising cost of living, essentially pushing low-income families further toward the valley's periphery:

"I've lived in the Coachella [Valley] for 28 years, my whole life.... Now as an adult, I'm starting to see a lot of changes, ... a lot of development moving in, gentrification. As time goes on, it's becoming more unaffordable, and folks are being pushed further east towards ... North Shore, towards the Salton Sea [and] Thermal, and there's inadequate housing as more folks move in and those who labor are pushed further out. They're the ones that are confronting these issues, the air quality, dealing with the Salton Sea."
-Indio resident

Interviewees were asked about what future changes they would like to see in their community, and what an "ideal environment" would look like. The vast majority described an "ideal" environment as one that simply includes basic conditions and services, such as clean air, potable water, more parks and green spaces, affordable trash service, a revived Salton Sea, and community centers. Residents articulated a basic desire to live in a healthy environment—a fundamental right.

Conclusion

This report shows that air quality and air quality's hindrance on outdoor activity vary by geography and demographics, as historically marginalized or underprivileged social groups report greater impacts. It should be noted that this study did not collect measurements of air quality, but only measured *perceptions* of air quality, with the assumption that perceptions correlate with actual air quality. Higher percentages of Hispanic residents report poor or fair air quality than do White residents. The same is true for female residents (compared to male residents) and younger residents (compared to older residents), more of whom report poor or fair air quality. Those living below the federal poverty level also report poorer air quality than those well above the federal poverty level. Further, higher percentages of residents in the Eastern Coachella Valley report poor or fair air quality, compared to those in the Western Coachella Valley.

Fewer differences were statistically significant for air quality's hindrance on outdoor activity; however, similar patterns emerge. Younger residents are more likely to report that air quality prevents outdoor activity than older residents. The same is true for those who live below the federal poverty level, whose outdoor activity is more likely to be impeded by air quality than for those well above the federal poverty level. Additionally, higher percentages of residents in the Eastern Coachella Valley reported that poor air quality has impeded them from doing outdoor activities, compared to those in the Western Coachella Valley.

In regard to those who reported poor or fair air quality, similar patterns appeared. Poorer air quality was reported by residents who have worse general health (compared to those with better general health), residents who do not have a safe place to recreate outdoors in their neighborhood (compared to those with a safe place to recreate outdoors), residents with no health insurance (compared to those with health insurance), and residents who report experiencing racism (compared to those who do not report experiencing racism). This pattern of disadvantage correlating with poorer air quality is also reflected in people's experience of the COVID-19 pandemic, with residents who reported financial and economic hardship more likely to have poorer air quality than those without such hardships.

There are similar though less dramatic differences among people's willingness to change lifestyle to minimize their harm to the environment, given that such willingness was high across all groups. Higher percentages of Hispanic residents expressed willingness to change their lifestyle for the environment than did White residents, although both groups reported high percentages. Higher percentages of females than males reported they are willing to change their lifestyle for the environment. Further, younger residents were more likely to report willingness to change lifestyle than were older residents, although all age groups also reported high percentages. Reflecting a slight difference, more residents in the Eastern Coachella Valley reported willingness to change their lifestyle for the environment than did those in the Western Coachella Valley.

While survey results showed a clear pattern of disproportionate impacts of poor air quality on underprivileged social groups, the interview results detailed these differences. Interviewees stressed that air pollution (from the Salton Sea, vehicles, dirt roads, agricultural burning, pesticides, etc.) is a major concern in the Eastern Coachella Valley because of health impacts

(e.g., allergies and asthma). Interviewees stressed the importance of accessing the outdoors, such as walking in one's neighborhood or visiting nearby parks. Interviewees also expressed concern with climate change, such as rising temperatures and fluctuations in the weather. The interviews also touched on other environmental concerns, such as drinking water contamination, dumping, trash in the streets, swarms of insects, and pesticides. When asked what an "ideal" local environment would look like, interviewees stressed the need for basic conditions and amenities, such as clean air, potable water, more parks and green spaces, affordable trash service, a revived Salton Sea, and community centers. Residents articulated a basic desire to live in a healthy environment—a fundamental right.

Environmental burdens disproportionately affect the Eastern Coachella Valley as well as all valley residents who are younger, female, Hispanic, and living in poverty, among other social characteristics. The Coachella Valley epitomizes the concerns of environmental justice.

These geographic and demographic disparities are further dramatized when one considers the extraordinary concentration of wealth and privilege found in pockets of the Western Coachella Valley, in neighborhoods of Palm Springs and Palm Desert, for example, or in the cities of Rancho Mirage and Indian Wells. The west end of the valley is home to multi-million-dollar homes, fountains and artificial lakes, gated country clubs, and luxury resorts, and the east end is home to poorly maintained trailer parks, contaminated wells, dirt roads, and expansive orchards and open fields. At the same time, working-class and non-White communities are found across the region, not only on the eastern side of the valley but also on the western side (such as in cities of Cathedral City and Desert Hot Springs, which are both majority Hispanic). Thus, although concentrated in the east, Hispanic, low-income communities across the region are disproportionately exposed and impacted by poor air quality. Understanding environmental justice in the Coachella Valley thus calls for examining the issue not by a simple dichotomy but a dual axis, as environmental disadvantage is correlated with both geographical and social differences.

Appendix

English-Language Interview Guide

Introduction and Ground Rules

- Welcome, and thank you for joining this interview. My name is [insert], and I am a researcher with HARC. HARC is a nonprofit research organization located in Palm Desert, California. We are conducting this project with a grant from the Environmental Justice Data Fund.
- We're seeking to better understand people's opinions about and experiences with the environment, such as with air pollution or outdoor recreation. We invite you to be as honest and open as you wish.
- In addition to these interviews, we are also analyzing survey responses from the 2022 Coachella Valley Community Health Survey. This survey data will help us understand how opinions about the environment differ among people in the valley, such as between the western and Eastern Coachella Valley.
- We will use the survey and interview results to write a final report. This report will be finished by July.
- I'll ask you a few questions to guide our conversation. There are no right or wrong answers. What is said in this interview will be kept confidential.
- We will never use your name when we report our findings. Instead, we'll use descriptors like "a resident of Coachella." Your identity will remain anonymous.
- We usually record these conversations because we want to make sure we are accurately capturing what is said. The recordings and the transcript would be kept confidential. Is it okay if I record our conversation or would you prefer that I take notes? [Only begin recording if consent is given by each participant.]
- Are there any questions before we start?

Questions for Interview/Focus Group

Introductions

1. Let's start with introductions. Would you like to share a little bit about yourself, such as where you live, what you do for work, what hobbies you have, or anything else?

Key Questions

2. How would you describe the air quality in your neighborhood?

3. Does the air quality ever stop you or hinder you or your family from doing outdoor activities? If so, how?
    a. [If necessary, provide prompt.] Problems with air quality might be, for example dust storms, sandstorms, the presence of air pollution, etc.
    b. [If yes] When does it tend to affect outdoor activities? What parts of the year?

4. Some people like to spend time in nature for recreation—such as camping, hiking, going for walks, etc. Are you or your family often able to spend time in nature for recreation?
    a. [If no] Why is that? What barriers are there to accessing natural places?
    b. [If yes] Could you tell me more? What do you like about spending time in nature?
    c. [If yes] What places do you think of regarding recreation or natural spaces?

5. What could be done to make natural places more accessible for you and your family?
    a. [If necessary, provide prompt.] For example, some people advocate for having more parks in their neighborhood, some people might need more holidays or paid time off, or others might want help finding hiking clubs or groups where they feel welcomed.

6. What health concerns or challenges to one's health do you have about the environment where you or your family lives, works, plays, or goes to school?
    a. [If necessary, provide prompt.] For example, some people might be concerned about air quality, the quality of drinking water, exposure to pesticides, or any other issue.
7. How long have you lived here in the Coachella Valley? What changes have you seen in the environment over this period of time?
    a. [If necessary, provide prompt.] For example, some people might have noticed, over the years, fewer species of some plants, or the building of more homes, or less natural habitat, or anything else.

8. One of the greatest environmental challenges is climate change, also referred to as the climate crisis. What are your thoughts about climate change?
    a. [If necessary, provide prompt] How serious of an issue do you think climate change is for your community?

9. If you could make any changes you wanted to your local environment, if anything were possible, what would an ideal or perfect environment look like to you?

a. [If necessary, provide prompt.] For example, some people would like to have a beautiful park in their neighborhood, or year-around clean air, or safe and affordable housing, or free access to convenient public transportation, or any number of things.

10. What do you think could be done to help you or others make these positive changes for your local environment?

Spanish-Language Interview Guide

Introducción y reglas básicas

- Bienvenido, y gracias por unirse a esta entrevista. Mi nombre es [insertar], y soy investigador de HARC. HARC es una organización de investigación sin fines de lucro ubicada en Palm Desert, California. Estamos llevando a cabo este proyecto con una subvención del Fondo de Datos de Justicia Ambiental.
- Estamos tratando de comprender mejor las opiniones y experiencias de las personas con respecto al medio ambiente, como la contaminación del aire o la recreación al aire libre. Lo invitamos a ser tan honesto y abierto como desee.
- Además de estas entrevistas, también estamos analizando las respuestas de la Encuesta de Salud Comunitaria del Valle de Coachella 2022. Los datos de esta encuesta nos ayudarán a comprender cómo difieren las opiniones sobre el medio ambiente entre las personas en el valle, como entre el oeste y el este del Valle de Coachella.
- Utilizaremos los resultados de la encuesta y las entrevistas para escribir un informe final. Este informe estará terminado en julio.
- Lo haré algunas preguntas para guiar nuestra conversación. No hay respuestas correctas o incorrectas. Lo que se diga en esta entrevista se mantendrá confidencial.
- Nunca usaremos su nombre cuando informemos nuestros hallazgos. En su lugar, usaremos descriptores como "un residente de Coachella". Su identidad permanecerá anónima.
- Por lo general, grabamos estas conversaciones porque queremos asegurarnos de que estamos capturando con precisión lo que se dice. Las grabaciones y la transcripción se mantendrían confidenciales. ¿Está bien si grabo nuestra conversación o prefiere que yo tome notas? [Solo comience a grabar si cada participante da su consentimiento.]
- ¿Hay alguna pregunta antes de empezar?

Preguntas para entrevista/grupo de enfoque

Presentaciones

1. Comencemos con introducciones. ¿Le gustaría compartir un poco sobre usted, como dónde vive, qué hace para trabajar, qué pasatiempos tiene o cualquier otra cosa?

Preguntas claves

2. ¿Cómo describiría la calidad del aire en su vecindario?

3. ¿La calidad del aire alguna vez le impide a usted o a su familia realizar actividades al aire libre? Si es así, ¿cómo?
    a. [Si es necesario, ofrece algunos ejemplos.] Los problemas con la calidad del aire pueden ser, por ejemplo, tormentas de polvo, tormentas de arena, la presencia de contaminación del aire, etc.
    b. [En caso afirmativo] ¿Cuándo tiende a afectar las actividades al aire libre? ¿En qué partes del año?

4. A algunas personas les gusta pasar tiempo en la naturaleza para recreación, como acampar, hacer senderismo, salir a caminar, etc. ¿Usted o su familia a menudo pueden pasar tiempo en la naturaleza para la recreación?
    a. [Si no] ¿Por qué? ¿Qué barreras existen para acceder a los lugares naturales?
    b. [En caso afirmativo] ¿Podría decirme más? ¿Qué le gusta de pasar tiempo en la naturaleza?
    c. [En caso afirmativo] ¿Qué lugares piensa con respecto a la recreación o los espacios naturales?

5. ¿Qué se podría hacer para que los lugares naturales sean más accesibles para usted y su familia?
    a. [Si es necesario, ofrece algunos ejemplos.] Por ejemplo, algunas personas aboguen por tener más parques en su vecindario, algunas personas quizás necesiten más vacaciones o tiempo libre pagado, u otras quizás quieran ayuda para encontrar clubes o grupos de senderismo donde se sientan bienvenidos.

6. ¿Qué preocupaciones de salud o desafíos para la salud tiene sobre el medio ambiento o el entorno donde usted o su familia viven, trabajan, juegan o van a la escuela?
    a. [Si es necesario, ofrece algunos ejemplos.] Por ejemplo, algunas personas puedan estar preocupadas por la calidad del aire, la calidad del agua potable, la exposición a pesticidas o cualquier otro problema.

7. ¿Cuánto tiempo ha vivido aquí en el Valle de Coachella? ¿Qué cambios ha visto en el medio ambiente durante este período de tiempo?

    a. [Si es necesario, ofrece algunos ejemplos.] Por ejemplo, algunas personas puedan notar, a lo largo de los años, menos especies de algunas plantas, o la construcción de más casas, o menos hábitat natural, o cualquier otra cosa.

8. Uno de los mayores desafíos ambientales es el cambio climático, también conocido como la crisis climática. ¿Cuáles son sus pensamientos sobre el cambio climático?
    a. [Si es necesario, pregunta más sobre eso] ¿Qué tan serio cree que es el cambio climático para su comunidad?

9. Si pudiera hacer los cambios que quisiera en su entorno local o medio ambiente local, si todo fuera posible, ¿cómo sería un entorno o medio ambiente ideal o perfecto para usted?
    a. [Si es necesario, ofrece algunos ejemplos.] Por ejemplo, a algunas personas les gustaría tener un hermoso parque en su vecindario, o aire limpio durante todo el año, o viviendas seguras y asequibles, o acceso gratuito a transporte público conveniente, o cualquier otra cosa.

10. ¿Qué cree que se podría hacer para ayudarlos a usted o a otros a hacer estos cambios positivos para el medio ambiente o su entorno local?