

Maunakea Gender Equity and Diversity Survey Report 2018

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MAUNAKEA GENDER EQUITY AND DIVERSITY COMMITTEE

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Executive Summary

In July 2018, employees of all Maunakea Observatories (MKOs) and astronomical institutes were invited to participate in a 63-question survey on gender equity and diversity. The survey was intended to (a) establish baseline demographics across the participating Observatories; (b) investigate workplace culture and opinions on workplace treatment and fairness and (c) invite opinion on the existence, awareness and importance of gender equity initiatives. The survey was anonymous, and though participants could volunteer to say which organization they currently worked for, no observatory-specific data will be released or comparisons made, in order to preserve participant anonymity.

This report is structured with an introduction to the survey, including background information on similar surveys, and a description of the survey design and intent. The survey included six themes - Demographics, Workplace Culture, Workplace Advancement, Mentoring, Workplace Treatment, Equity and Diversity initiatives and Gender Diversity programs. Each theme has a section in the report, with the aims, results, and key findings presented for each set of questions. Analysis and key recommendations round out the end of the report.

The response to the survey was strong, with 357 responses – approximately 70% of the current MKO workforce. 32% (112) of participants identified as women, reflecting closely the total percentage of women at MKO organizations (30%), providing a good sample for the opinions of the community as a whole.

The MKO community is dedicated – with a majority of participants happy in their current job role, and working consistently longer than their contracted hours.

Women are a majority in only one job field: administration. In scientific roles, 31% of the participants were women, but this number falls to just 12% in technical (technician and engineering) positions. Women make up just 20% of MKO management. We also fail to retain women: 71% of women have been in their roles for less than 5 years (compared to 43% of men).

MKO participants report the need for more communication from their executive regarding factors that determine career advancement, and their organization's practices regarding equity and diversity. Women report that they do experience career setbacks as a result of their gender, have experienced poor treatment in their organizations as a result of their gender and fully expect their gender to continue to affect their future careers.

This survey is intended as a catalyst: implementation of its recommendations, and future initiatives could allow the Maunakea Observatories to lead the world not just in scientific excellence, but in the equity and diversity of it's community as a whole.

Introduction

Studies of equity and diversity in organizations have shown that teams with gender balance and diverse ethnic and age demographics are more effective, creative and achieve higher project completion [1]. Improving gender balance, and increasing representation has shown to eventually self-sustain, and also reduce discrimination and increase staff retention and morale.

Extensive, long-term research shows that STEM fields, particularly physics and engineering, have low percentages of women in professional and senior academic roles [2],[3], and that these numbers are increasing somewhat with time, but not significantly and only in some scientific fields [4].

Further studies have shown that increasing the number of women in STEM professions, and retaining them successfully, is not achieved organically [5], but instead requires organizations and institutes to implement equity and diversity programs [6].

The Maunakea Observatory community has a high concentration of scientific and technical professionals in a small geographic location. Individual organizations have participated in some previous studies of equity and diversity, but no broad survey has been conducted to poll the demographics or attitudes of the astronomy community in Hawaii at large, with respect to these issues.

How many women do we employ at the Maunakea Observatories, and how does this compare with the demographics in other STEM organizations in the United States and across the world?

Are we reflecting the demographic make-up of the Hawaii state and the US?

How do our demographics compare in various job roles, and in senior roles?

What are the Observatories doing to enhance equity and diversity?

Do Maunakea Observatory staff experience career setbacks, or bias in their workplace, as a result of their gender or another characteristic?

What are employees' awareness of their organization's practices and attitude to equity and diversity, and what are their own opinions on these concepts?

How can we do better?

In mid-2018, a survey was distributed to the institutes and Observatories that make up the Maunakea astronomy community. The survey followed on from initial discussions made at the Directorate level of these organizations and the Women of Maunakea event held on International Womens' Day, in early 2018. A common discussion point at these events was the lack of a structured discussion and investigation of success, or otherwise, of gender equity and diversity initiatives across the astronomy community. The survey was designed by a committee of volunteers from the participating institutions: Keck, Gemini, CFHT, EAO (JCMT), Subaru, UKIRT, IRTF, SMA and IfA (Oahu, Maui and Big Island). The survey goals were to:

- *Establish baseline demographics across the participating Observatories*
- *Investigate workplace culture and opinions on workplace treatment and fairness*
- *Invite opinion on the existence, awareness and importance of gender equity initiatives*

The survey intent was to initiate discussion and dialogue on equity issues, gender-based discrimination, and the needs of the community to improve equity, diversity and inclusion in the Maunakea astronomy community. The driver for the initiative is to provide a data-driven snapshot of community opinions that can be used to inform future initiatives to improve community inclusion, cohesion, as well as better recruitment and staff retention.

Survey Description

The survey was created and distributed via the SurveyMonkey.com web-based survey tool. It consisted of 63 questions, taking typically less than 15 minutes to complete and broken down in to seven themes: Demographics, Workplace Culture, Workplace Advancement, Mentoring, Workplace Treatment, Equity and Diversity initiatives and Gender Diversity programs. Participation was voluntary and anonymous. Most questions were dichotomous (for demographic questions), with options to prefer not to respond if the information was too sensitive for the respondent to provide, or Likert-type scale questions for the opinion sections (five options ranging from strongly agreeing through to strongly disagreeing, or similar). A number of questions allowed participants to add written opinion and explanation if they chose. A full copy of the survey questions is provided in Appendix A.

Basis for the question sets were from a range of sources, including sample questions from the UK-based Athena Swan program [6] and similar surveys and studies

formulated for business and STEM-field academic institutes, including the American Astronomical Society [3], [7].

Concerns were raised during the initial rounds of advertisement of the survey that the specificity of questions (particularly demographic questions asking about the respondent's current place of employment) could lead to identification of individuals, despite the assurance of anonymous participation. For this reason, the full dataset of responses will not be publicly released, and all results will be presented in aggregate – with no Observatory-specific splits or comparisons in the results or analysis.

Response rate

In order to measure response rate, the committee members from each institute were asked to provide basic demographic information of their organization, current to the time of the survey, July 2018. The survey was announced and opened for responses in the first week of July, closing on the 31st of the month. A total of 357 responses were received. Based on the institute-provided staff numbers, which totaled 530 employees (across both Oahu, and the Big Island) at the time of the survey, this was a response rate of 67%. In total at the time of the survey, 165 women were employed at a Maunakea Observatory or institute, approximately 31% percent of the total workforce.

Demographics

Participants were asked fourteen demographic questions. All questions provided the option to 'prefer not to say', in order to preserve anonymity.

The aims in this section were to:

- *Understand the gender, age and ethnic identity distribution across the MKOs.*
- *Establish how these groups are distributed in the MKOs in terms of employment type (full or part time work and job role).*
- *Measure the number of locally educated, and locally hired staff currently employed at the MKOs.*

Gender identity and age distribution

32% (112) of the survey participants identified as women. Table 1 details the gender distribution as a function of employee age, shown in graphical form in Figure 1. For more appropriate comparison with similar studies, which look at the gender demographics in STEM fields, these statistics are presented for those participants who identified their roles as science or technical positions – a sample of 271 out of 356 participants. Of MKO participants in STEM fields, 21% (58) were women (compared to the US average of 24% [2]).

Notably, the gender balance is closer to parity in the younger age groups, something also seen in the AAS 2013 survey, which reported the proportion of younger AAS women (Born after 1980) at 40% compared to 21% of AAS women born before 1980 [3]. These percentages are very nearly identical to those shown for MKO STEM participants as shown in Table 1 and in Figure 2, with 37% of women in under 35 age group, reducing to less than 18% over 35. The median age across the Observatories is 47 years of age.

Table 1: Gender identity distribution of MKO survey participants by age group. Percentages are of the total in an age group. Actual number of participants in each category is in brackets.

	Women (overall)	Men	Total
	Women (STEM)	Men (STEM)	Total (STEM)
Under 25	50% (11)	50% (11)	22
	36% (5)	64% (9)	14
25 – 35	38% (25)	62% (41)	66
	37% (22)	63% (37)	59
36 – 45	23% (16)	77% (55)	71
	11% (6)	89% (51)	57
46 – 55	27% (24)	73% (65)	89
	19% (13)	81% (54)	67
Over 55	35 % (36)	65% (67)	103
	17% (12)	83% (59)	71
Total	32% (112)	68% (239)	351
	21% (58)	79% (213)	271

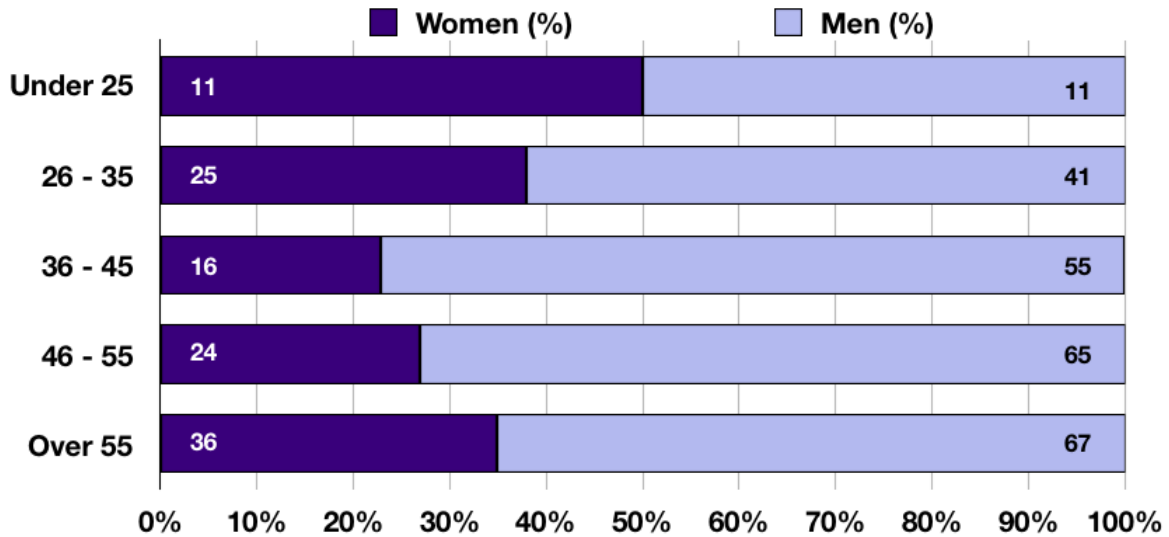


Figure 1: Gender identity (%) distribution by age group. Total number of participants given in the individual bars.

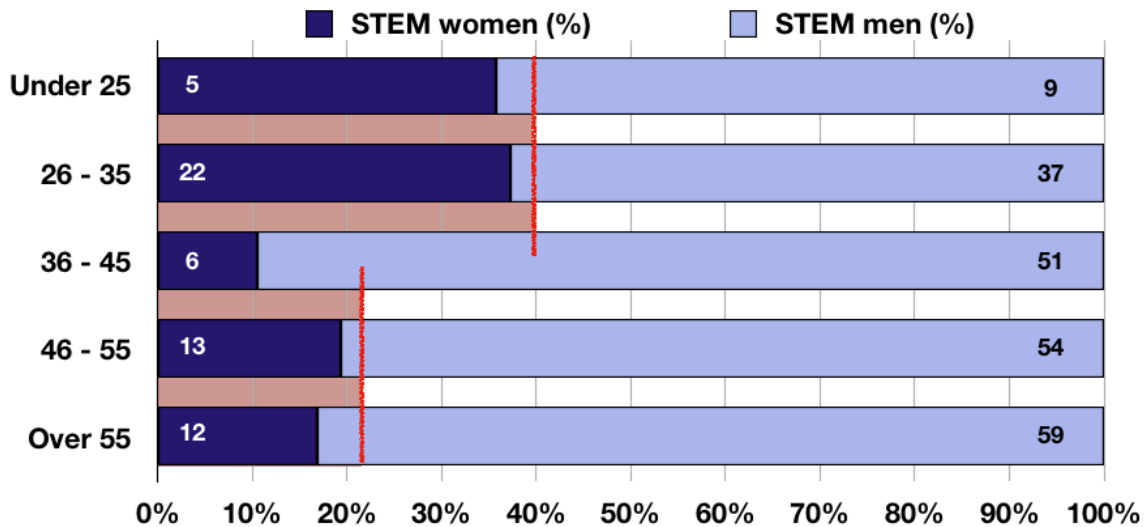


Figure 2: Gender identity by age group, in STEM job roles. Red lines and shaded sections show percentage of women in AAS survey (40% born after 1980, 21% born before 1980).

Ethnic identification

The participants were asked to select the ethnic group with which they most identified. It should be noted that this did not allow participants to identify multiple ethnicities. Acknowledging that a large percentage of the Hawaiian residential population is mixed-race (over 23%), these comparisons should therefore be taken somewhat loosely. The Hawaii and US ethnicity percentages are taken from the US Census Bureau [9]. Table 2 and Figure 3 compare the MKO survey participants overall ethnic demographic to the general Hawaii and US ethnic distributions. Figure 4 presents the ethnic identity distribution of participants by gender identity.

Table 2: Distribution (%) of ethnic identity of MKO participants ("MKOs"), compared to the Hawaii state and US general populations.

	MKOs	Hawaii	US
White/ Caucasian	62%	23%	62%
Asian	25%	39%	5%
Hawaiian	6%	6%	0.2%
Hispanic/Latinix	4%	9%	17%
American Indian / Alaskan native	1%	0.3%	1%
Other Pacific Islander	1%	4%	0.1%
Black/African-American	1%	2%	12%

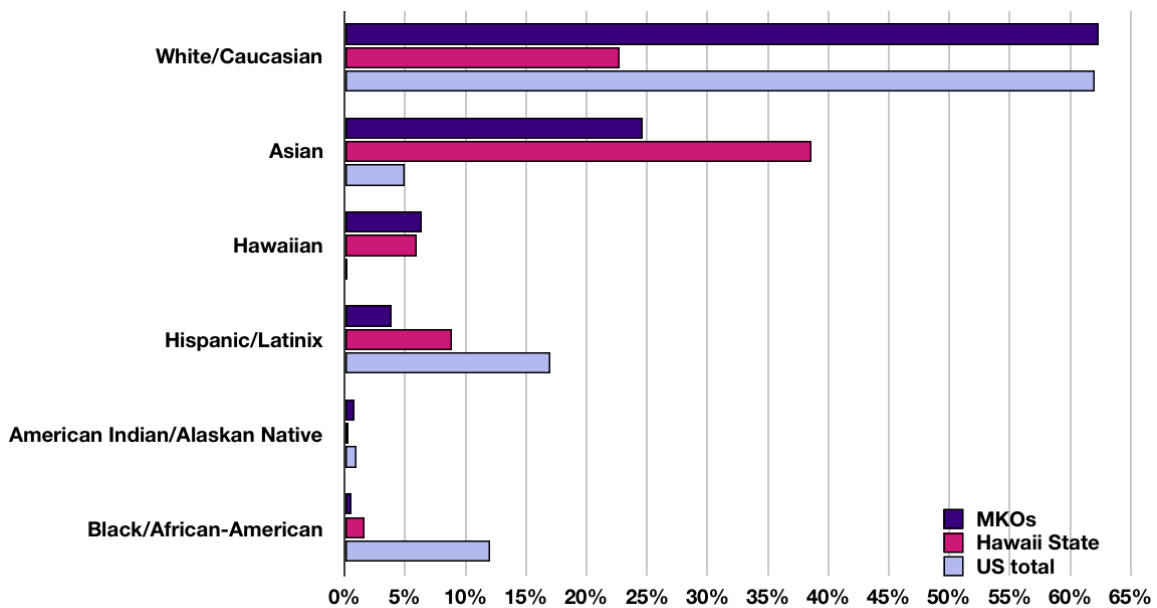


Figure 3: Ethnic identity distribution of the MKO survey participants compared to the general Hawaii and US populations.

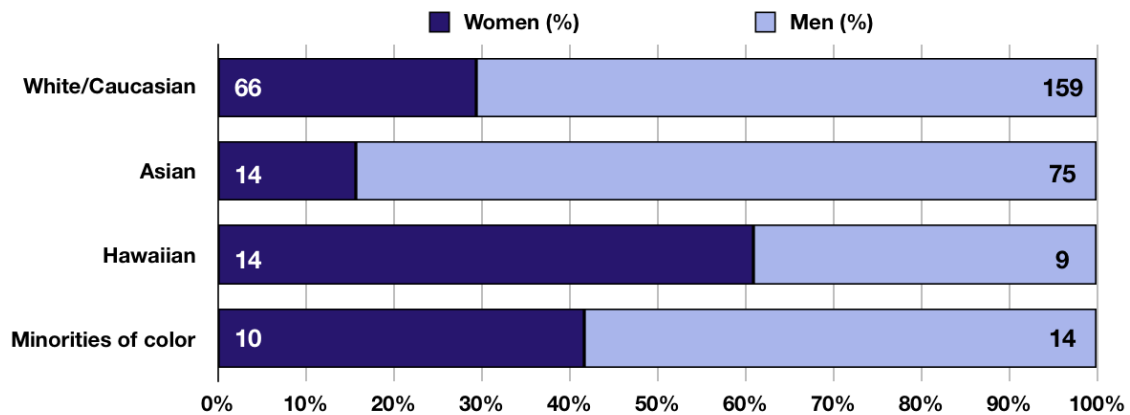


Figure 4: Ethnic identity distribution of MKO participants by gender group. Minorities of color includes: Hispanic/Latinix, Black/African-American, American Indian/Alaskan Natives and Other Pacific Islanders.

Education level

Survey participants were asked to indicate the highest educational qualification they had received. Table 3 presents the MKO employee’s distribution of educational qualifications, by gender group and overall.

Table 3: Distribution of educational qualifications by gender for MKO participants. Percentages are of the total in a gender group. Actual number of participants in each category is in brackets.

	Women	Men	Total
Less than High School	1% (1)	0% (0)	1
High School or equivalent	2% (2)	4% (9)	11
Some college	10% (11)	2% (5)	16
Associates degree	6% (7)	6% (14)	21
Trade school	0% (0)	1% (3)	3
Bachelors degree	32% (36)	26% (63)	99
Masters degree	18% (20)	18% (44)	64
Doctoral or professional degree	31% (35)	42% (101)	136

The distribution of educational qualifications of the MKO participants by gender group is given in Figure 5.

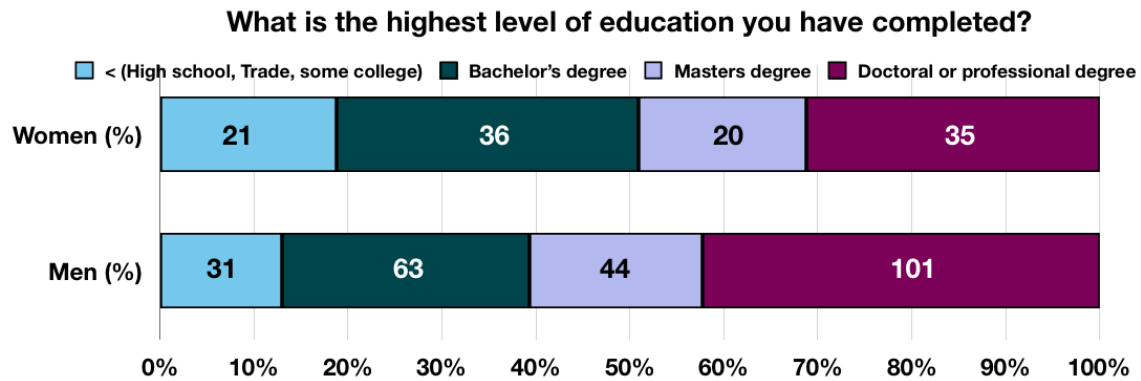


Figure 5: The educational qualifications of MKO participants, presented by gender identity group. Actual number of participants in each category is displayed in each bar.

Job roles

Participants were asked to identify the area of their job responsibilities. Table 4 presents the distribution of employee roles by gender.

Table 4: Distribution of MKO staff job roles by gender. Percentages are of the total in each gender group. Total numbers of participants in each job role and gender is given in brackets.

	Women	Men	Total
Administration	35% (37)	3% (6)	43
Technician	5% (5)	17% (39)	44
Engineer	7% (7)	23% (53)	60
Intern	4% (4)	1% (2)	6
Student (undergraduate)	2% (2)	1% (2)	4
Student (postgraduate)	4% (4)	6% (13)	17
Postdoc	5% (5)	5% (11)	16
Staff Scientist / Researcher	20% (21)	20% (46)	67
Science Operations	11% (12)	10% (24)	36
Management	8% (8)	14% (33)	41

Figure 6 presents the number and percentage of women and men in scientific/academic roles in the MKOs, with the job roles presented from junior (top) to senior (bottom). In Figure 7, the academic and science operations roles are condensed into a single ‘science fields’ group, the technician and engineering roles are grouped as ‘technical fields’. The gender demographic in each general field is presented, with % of women (and ethnic identity) on the left and % of men (and ethnic identity) on the right. In a gender-balanced field, the bars should be centered on the plot.

In similar studies, such as the CWAS 2013 survey on women in astronomy [7], the percentage of women in graduate astronomy studies is 34%, falling to 28% at postdoctoral level, then down to 14% at full faculty appointment level. Just 16% of the IAU members are women [10].

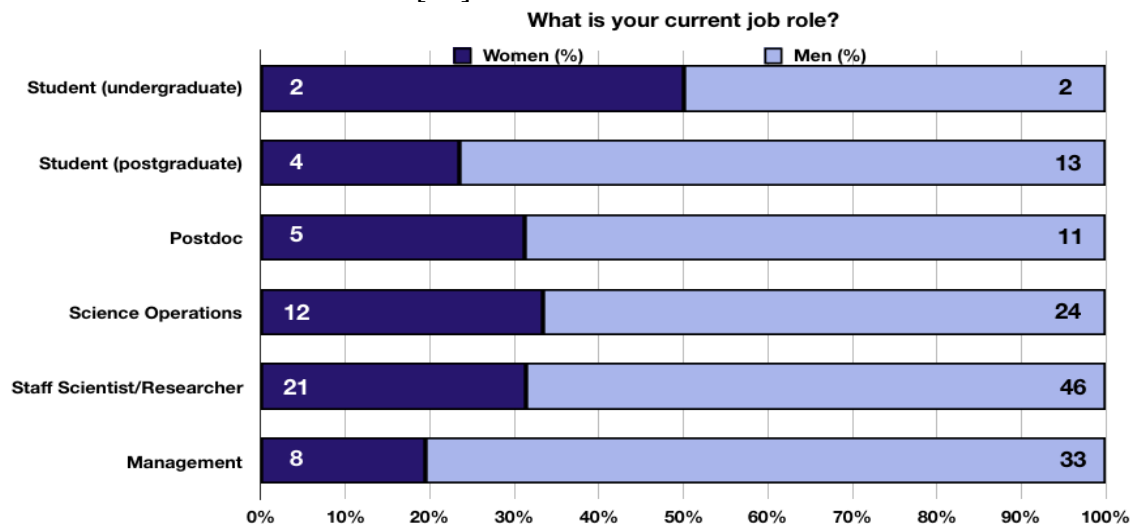


Figure 6: MKO participants in academic roles from junior (top) to senior (bottom) presented by gender identity. Total number of participants in job role by gender is given in the bars.

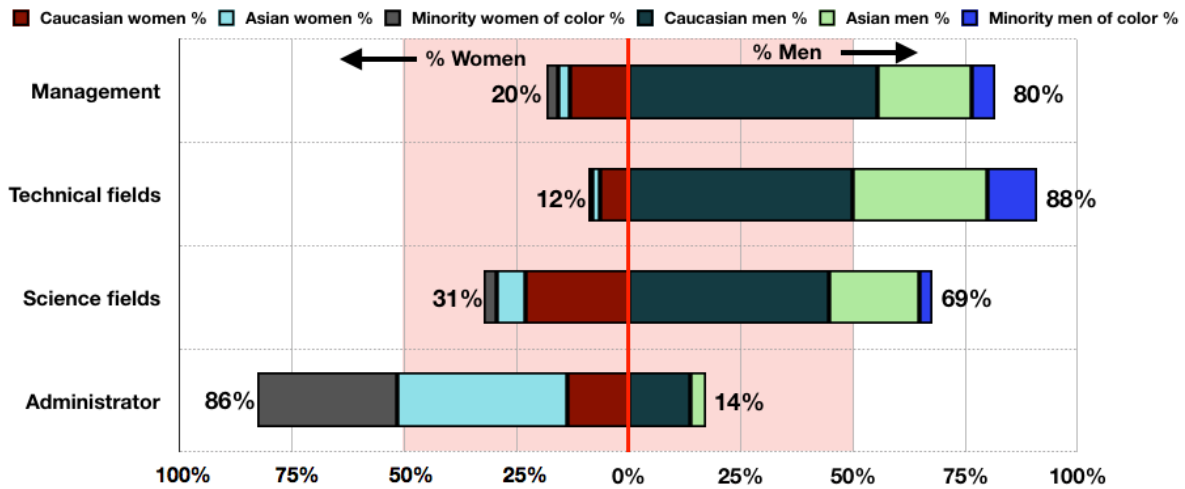


Figure 7: Job fields shown as function of participant's gender and ethnicity. Technical fields include technicians and engineers. Science fields include all academic roles and science operations. The red shaded section is a guide - if the bar is fully within the section, the job field has gender equity.

Job Hours and employment type

Most MKO employees (78%) report to be in permanent/open-ended contracts as opposed to 22% in fixed-term or temporary roles. No significant gender, ethnicity distributions deviate from these values. 41% of participants report they work full-time, fixed hours, with 56% working full-time but flexible hours, with just 4% working part-time. Again, no significant age, ethnic or gender deviations from these trends are seen. Participants were asked to identify the length of time they have been in their current job role. The results are presented in Table 5 and Figure 8.

Table 5: Length of time the participant has been in their current job role, by gender. Percentages are of total in a gender group. Total numbers of participants are given in brackets.

	Women	Men	Total
	Women (STEM)	MEN (STEM)	Total (STEM)
Less than one year	23% (25)	13% (30)	55
	27% (15)	13% (27)	42
1 – 2 years	14% (15)	9% (22)	37
	23% (13)	9% (19)	32
2 -5 years	24% (26)	21% (48)	74
	21% (12)	21% (43)	55
5 – 10 years	6% (7)	16% (38)	45
	5% (3)	16% (34)	37
10 – 20 years	22% (24)	28% (64)	88
	11% (6)	28% (59)	65
More than 20 years	11% (12)	13% (30)	42
	13% (7)	13% (26)	33

How long have you been in your current position?

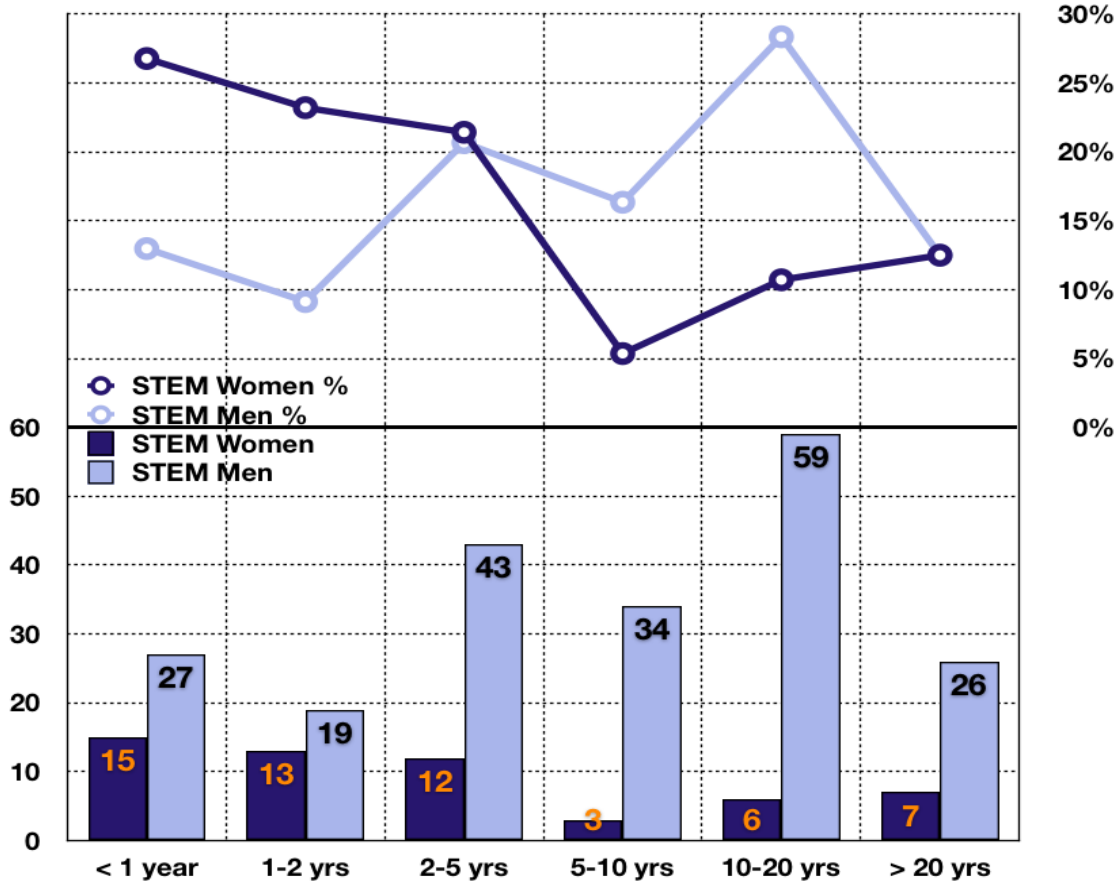


Figure 8: Length of time the STEM field participant has been in current job role. Top plot (right axis) shows % of gender group total in each time bin, bottom plot (left axis) shows total number of gender group in each time bin.

Caring responsibilities

Participants were asked to identify if they had any caring responsibilities (child, parent, spouse etc). A statistically significant difference is seen in the participants: 41% (44) of women surveyed have caring responsibilities versus 59% (64) that do not, whereas the trend is reversed for men, with 59% (138) men reporting having caring duties compared to 41% (97) that do not. This difference is most extreme for Caucasian women, only 32% of whom have caring responsibilities at home, and women under 45 years of age (24% have caring responsibilities versus 76% who do not). The differences in these responsibilities by gender and ethnic group, and by gender and age group, are shown in Figures 9 and 10, respectively. Participants in STEM fields show the most extreme disparity: only 34% (19) women in STEM job roles have caring responsibilities (66% - 37 do not), versus 60% (125) men in STEM roles who also have caring responsibilities. (40% - 83, do not), as shown in Figure 11.

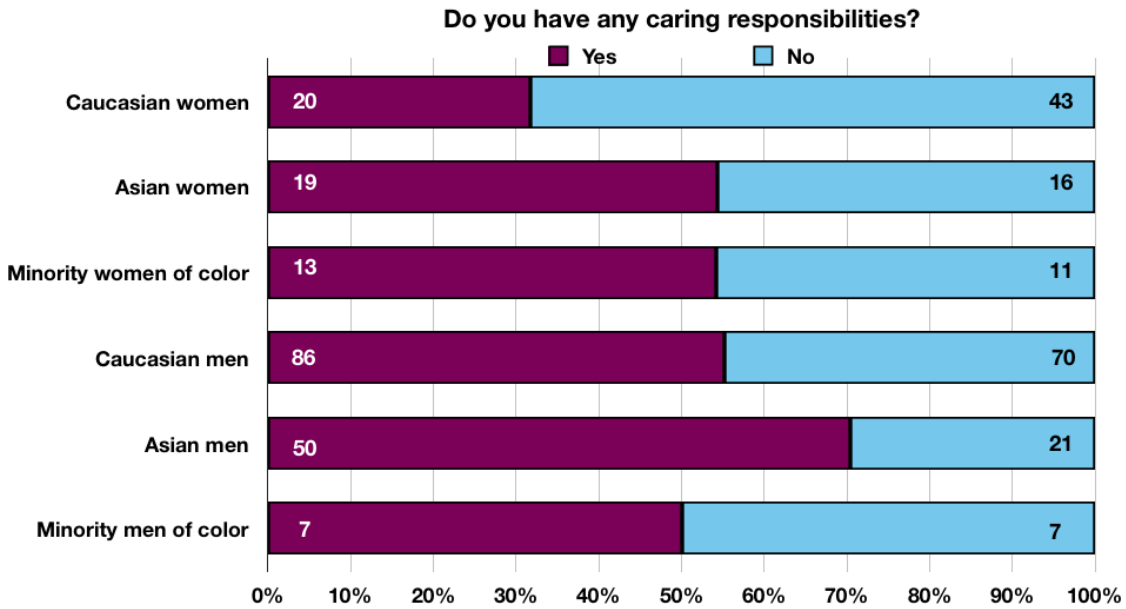


Figure 9: Split of MKO participants with caring responsibilities versus those without, presented by gender+ethnic identity.

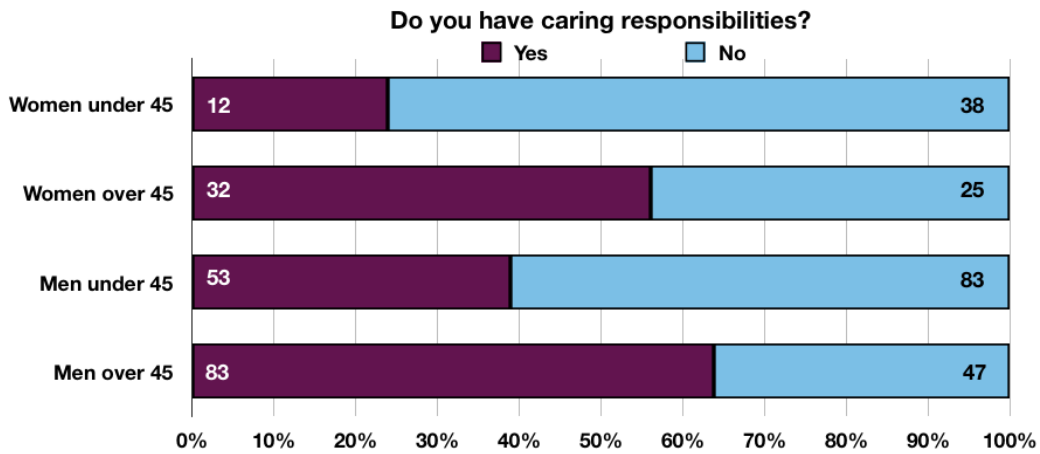


Figure 10: Split of MKO participants with caring responsibilities versus those without, presented by gender+age group.

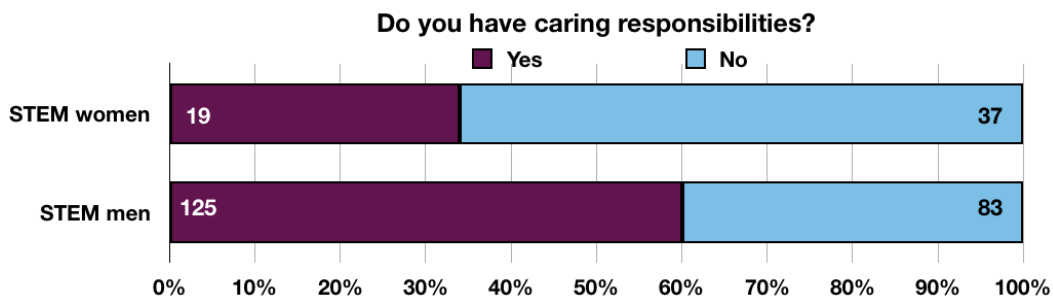


Figure 11: Split of MKO participants in STEM job roles with caring responsibilities versus those without, presented by gender group.

Origin at time of hire and Hawaii-educated staff

Half of all MKO participants (51% - 177) were residents of Hawaii when they were hired into their current job. 59% (65) of women were resident in Hawaii when they were hired into their current role, while 47% (112) of men were resident at the time they took up their current position. No significant statistical difference is seen from this except ethnic Hawaiian employees, of whom 79% (38) were resident in Hawaii at the time of their hire.

Of the current MKO employees who participated in the survey, 22% (75) attended high school in the state of Hawaii. Of those who attended school in Hawaii, 40% were women (30) and 60% men (45). Hawaiian staff had the highest percentage of local schooling with 23 out of 24 participants attending high school in the state, in contrast to the Caucasian Hawaii education attendance of 14% (32). Figure 12 shows the split of local versus out-of-state high school education of MKO participants, by ethnic identity.

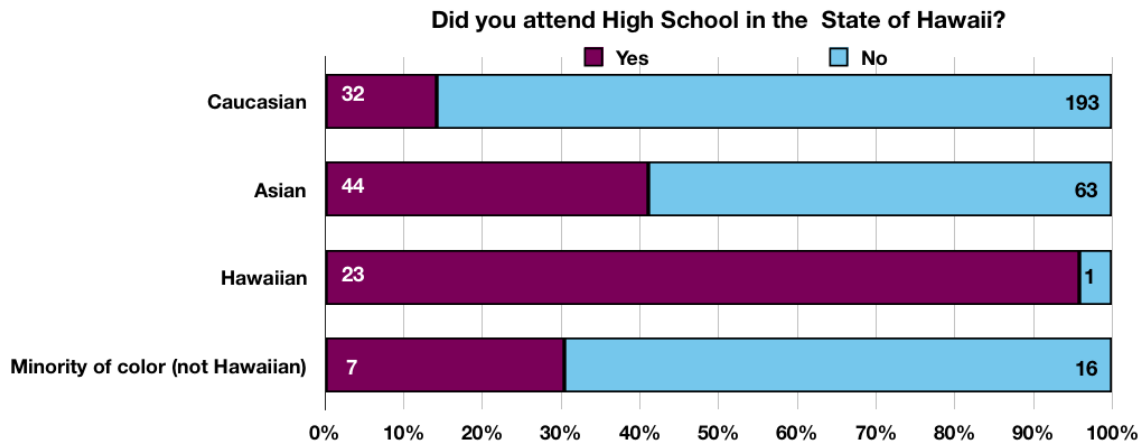


Figure 12: MKO participants who attended high school in the State of Hawaii versus out-of-state, presented by ethnic identity. Minority of color (not Hawaiian) includes Hispanic/Latinix, Black/African-American, American Indian/Alaskan Natives and Other Pacific Islanders.

Locally educated staff are significantly more likely to work in administrative or technical positions than employees educated out of Hawaii, make up less than 6% of science staff, and hold 12% of management positions. The distribution of locally educated staff by job role compared to those educated out of state is shown in Figure 13.

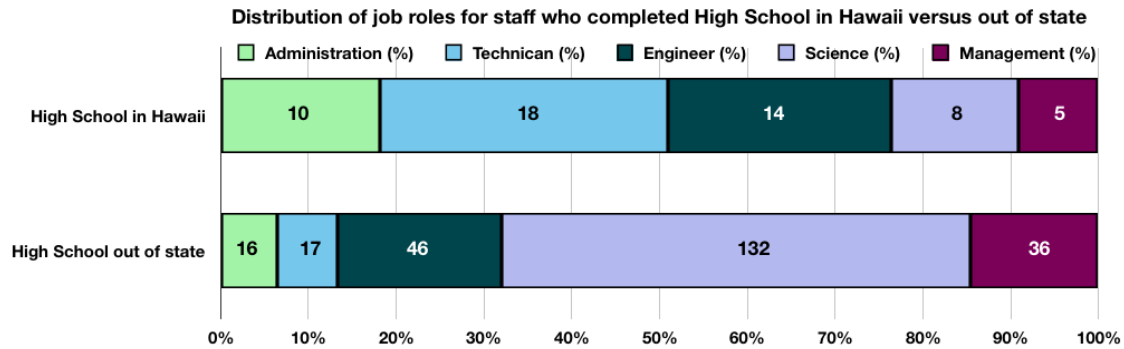


Figure 13: Distribution of job roles for MKO participants who attended High School in the State of Hawaii compared to those who attended school out of state.

Demographics: Key Findings

- *The overall percentage of women respondents employed at MKOs is 32% [112], with the highest representation in administrative positions (35%) and lowest in technical jobs (12%).*
- *31% of Maunakea scientists (graduate, postdoc, staff researchers and science operations) are women – compared to the AAS percentage 25% and IAU membership percentage of 16%.*
- *Women making up only 20% of Observatory management and senior institute positions and hold 21% of STEM jobs (science+technical) compared to the US average of 24%.*
- *71% of women in scientific positions have been in their job less than five years, compared to 41% of men.*
- *41% of women staff have caring responsibilities at home (child, partner, parent), compared to 59% of men. Just 24% of women under 45 hold a position at a Maunakea Observatory and also have caring responsibilities at home.*
- *MKOs employ a significantly larger percentage of Asian staff (25%) than the US average (6%), but lower than the Hawaii state average of 39%, while the percentage of Caucasian/White MKO staff equals the US average of 62%.*
- *24 of the MKO respondents identified as ethnic Hawaiian, 6% of the total - equal to the state average. Locally educated staff make up 22% of the MKO workforce but are concentrated in administrative and technician roles.*

Workplace Culture

Participants were asked a series of questions regarding their general level of happiness or unhappiness with their job, management, responsibilities and work load. All questions were Likert-scale, either from 'Happy' through to 'Unhappy', or 'Strong Agreement' through to 'Strong Disagreement'.

The aims of this series of questions were to:

- *Gauge general levels of employee satisfaction with their roles, career and management*
- *Understand if staff feel appreciated for their efforts and their key motivations*

Job Satisfaction

Participants were asked to rate their level of happiness regarding their current role, opportunities for advancement, and their senior management team. Table 6 presents the aggregate totals where 'Happy' includes those who selected either 'Very Happy' or 'Somewhat Happy', and 'Unhappy' includes both 'Somewhat Unhappy' and 'Very Unhappy' responses. Figure 14 shows the gender split in responses for the same questions. No significant differences were seen for other demographic groups (age, ethnicity).

Table 6: Distribution of job satisfaction for MKO survey participants overall (1st/3rd column), and split by gender group (2nd/4th column). Percentages are of the total and group responses to each question.

How happy or unhappy are you with:	Happy	Women	Unhappy	Women
		Men		Men
Your current role at your job?	83% (291)	88% (94)	9% (33)	7% (8)
		80% (188)		11% (25)
Your opportunities for advancement?	44% (156)	48% (53)	22% (76)	23% (25)
		43% (100)		22% (51)
With senior management?	57% (200)	62% (66)	23% (79)	21% (22)
		56% (132)		23% (53)

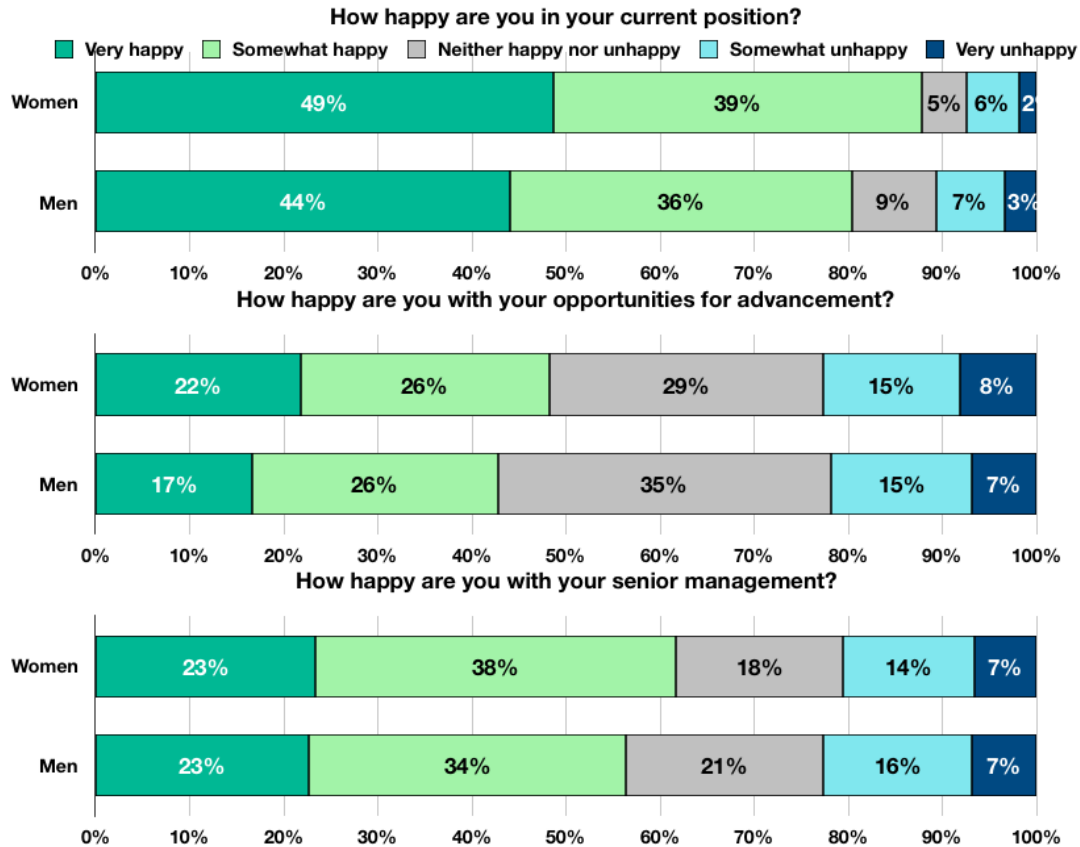


Figure 14: MKO survey participants job satisfaction levels, presented by gender identity group.

Work-life balance

When asked how regularly they work longer than contracted hours, results showed that MKO employees are dedicated, reporting that the majority of staff work longer than contracted hours, with 51% (179) saying they regularly work longer hours, and an additional 43% (153) reporting that they sometimes worked longer than contracted. Just 6% (21) said they only worked their contracted hours. No significant differences in these percentages were seen with any demographic comparison.

Participants were asked a series of questions on their contentment with their work/life balance – the results are presented in Table 7. Here, ‘Strongly Agree’ and ‘Agree’ are grouped together, likewise ‘Disagree’ and ‘Strongly Disagree’ are grouped. No statistically significant differences were seen in the gender, ethnic or age comparisons. Figure 15 displays the gender comparison of responses to these questions, with each Likert-scale response presented.

Table 7: MKO participant's responses to questions on workplace culture, overall (1st/3rd column), and by gender group (2nd/4th column). Percentages are of total and group total responses to each question.

	Agree	Women	Disagree	Women
		Men		Men
I am happy with my work/life balance	63% (220)	62%(66)	18% (63)	19% (20)
		65% (151)		17% (40)
Additional work is appreciated by my manager/department	46% (163)	50% (53)	20% (71)	24% (25)
		46% (107)		19% (44)
My department has a clear and transparent way of allocating workload	64% (223)	71% (75)	36% (124)	29% (31)
		61% (140)		39% (90)
People regularly turn to me to share ideas when making important decisions in my organization	48% (168)	46%(49)	27% (94)	31% (33)
		50% (118)		24% (57)

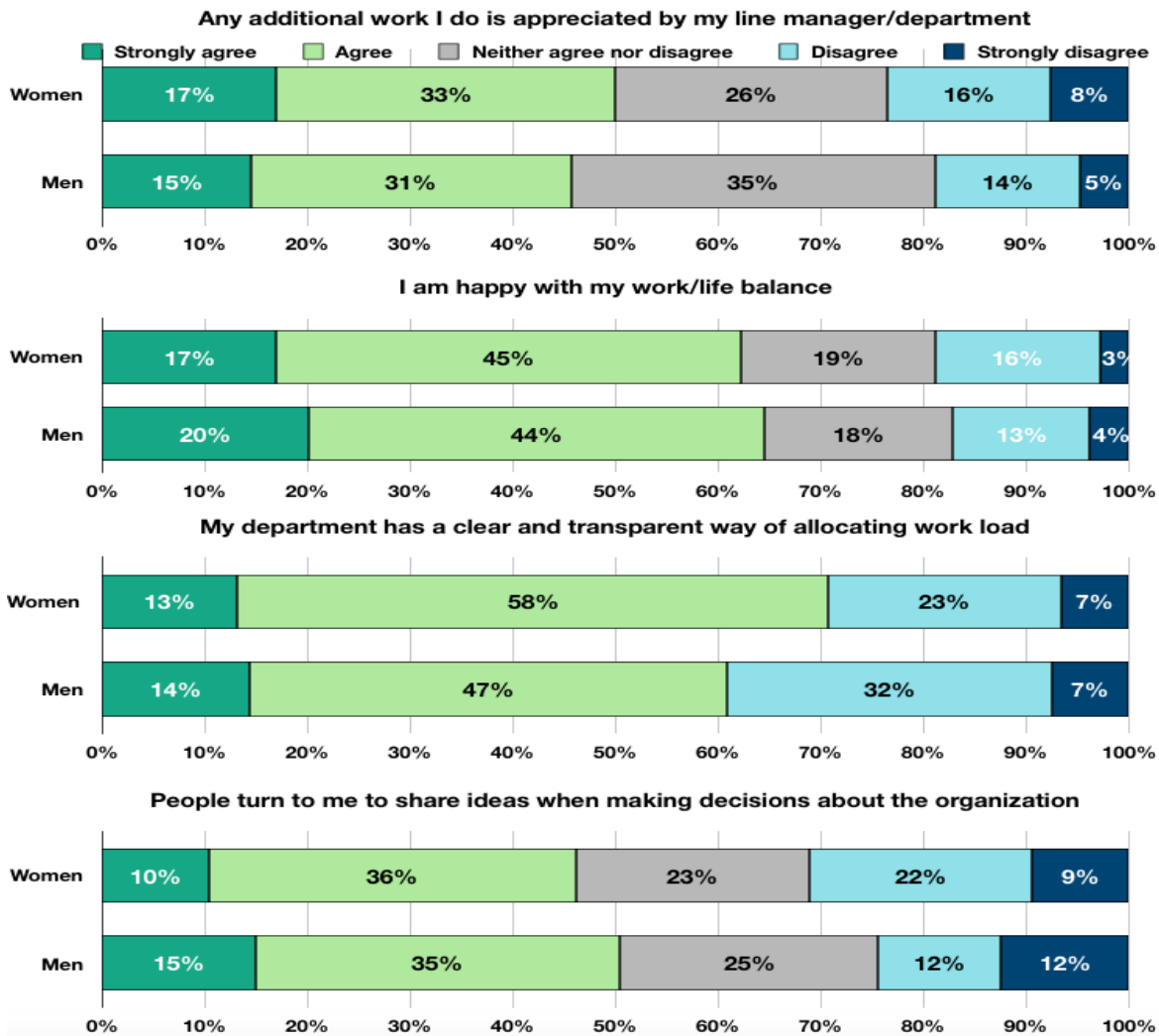


Figure 15: MKO participant responses to questions on workplace culture, presented by gender group.

Motivation

Participants were asked to identify the greatest pleasure they got from working, as well as whether they felt they were given disproportionate responsibilities in any specific area. The gender split of results is shown in Figure 16.

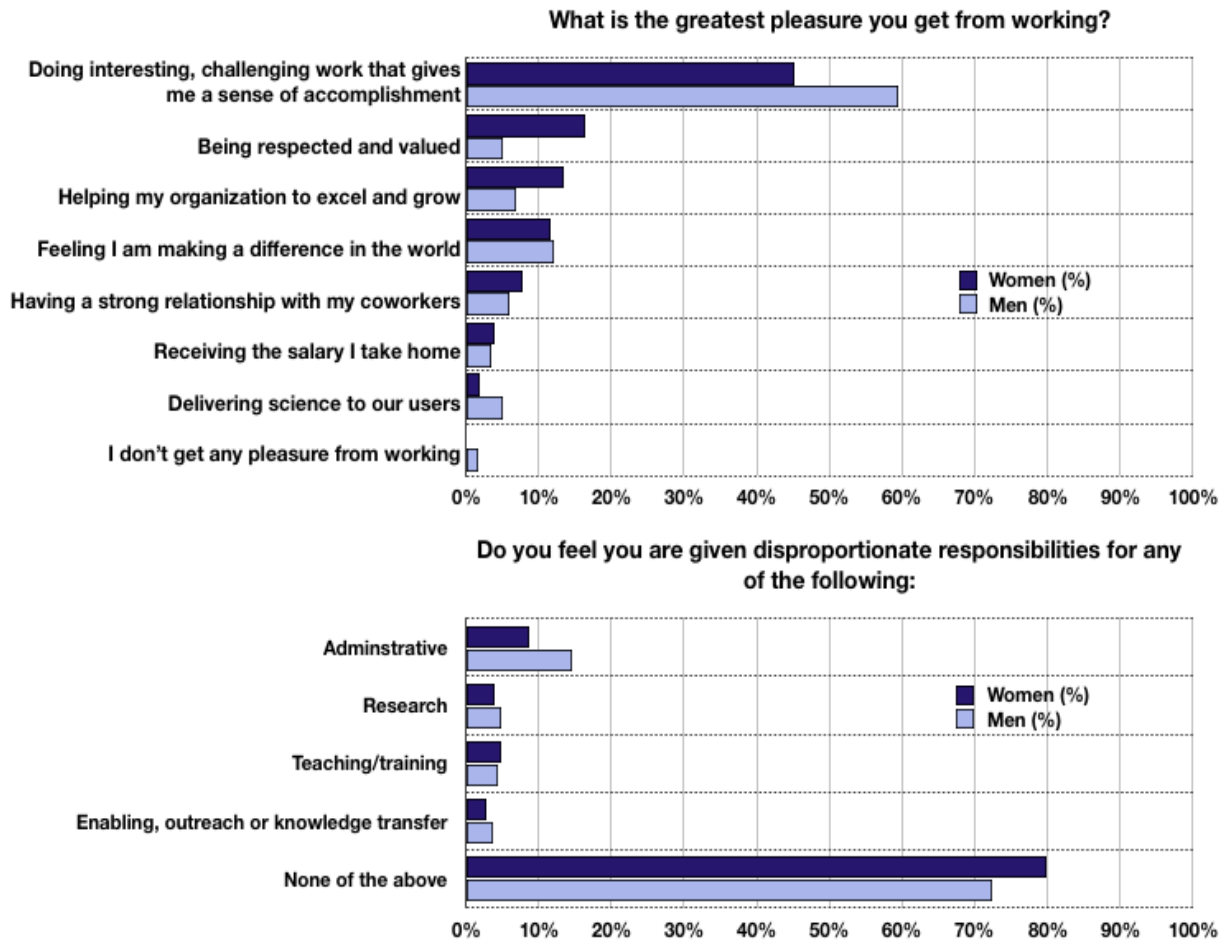


Figure 16: MKO employees report on the greatest pleasure they get from working, and their feelings on responsibility loading, presented by gender identity group.

Workplace culture: Key findings

- *Maunakea employees are happy – 83% at least somewhat happy with their current role, and most staff pleased with their executive management group (57%) but a significantly lower fraction happy with their opportunities for advancement (44%).*
- *Long hours are the norm – 51% of staff report regularly working longer than their contracted hours, and an additional 43% saying they do so at least occasionally, though only 49% of staff feel they are acknowledged for working beyond their requirements by their direct manager.*
- *48% of staff report that they are asked to share ideas when critical issues or decisions need to be made at their organization.*
- *59% of men, and 45% of women find their greatest pleasure in their job is doing interesting and challenging work. A significantly higher percentage of women (16%) enjoy most feeling valued and respected, and contributing to their organizations (13%) than men, (5 and 7% respectively).*

Workplace Advancement

This section of ten questions solicited opinion on the factors individuals believed were used at their organization to determine career advancement.

The aims were to:

- *Understand the individual's view on what factors were important at their organization when determining advancements such as promotions, raises or bonuses.*
- *If there were gender, age or ethnic group differences in these views, or in what opportunities were offered to participants*

Career advancement factors

Participants were asked their opinion on how much weight their management team placed on six factors when determining career advancement: ability, senior sponsorship, gender, race, tenure in organization, and academic/professional certifications. The specific question was to rank the factors that the participant thought determined organizational promotions/raises or bonuses on a Likert-type scale of 'Extremely', 'Very' or 'Somewhat Important', 'Not Very Important' and 'Not

Important At All'. In the following figures, 'Extremely', 'Very' and 'Somewhat' Important responses are collated as "Important", while 'Not Very' or 'Not At All' Important are collated as "Not Important."

In analysis, some statistically significant differences in response were noted as a function of the age of the respondent. These are grouped below in an "Under 45" – under 45 years of age, or "Over 45" – over 45 years of age.

No strong variance was seen when comparing responses by ethnic identity – the exception being the Minorities of color (Hawaiian + Hispanic/Latino + Black/African American) response to the importance/non-importance of race in determining advancement: 20% of these participants found it an important factor, compared to the general total of 8% of MKO participants who thought it was important.

Figure 17 shows the MKO participants' opinions on the factors affecting career advancement. Responses are presented by gender and age group. Participants were allowed to select "I'm not sure" if they were not certain if a certain factor was important: these responses are tallied on the right hand side of each sub-figure. Table 8 presents the participants responses when asked to select those career opportunities available to them through their organization, with gender and age group response comparisons.

Table 8: MKO participants report on the external opportunities provided to them at their organization, overall (1st column), by gender (2nd column) and age group (3rd column). Percentages are of total respondents to the question (338 total, 330 who defined their gender and 338 their age).

I am encouraged to take part in the following at my organization:	Total	Women	Under 45
		Men	Over 45
Attend conferences	56% (186)	50% (53)	59% (84)
		59% (133)	58% (91)
Present at conferences	48% (159)	46% (48)	58% (83)
		49% (111)	40% (73)
Sit on department or external committees	28% (92)	22% (23)	22% (32)
		31% (69)	33% (61)
Training opportunities	56% (186)	63% (66)	56% (80)
		53% (120)	57% (104)
Networking opportunities	29% (96)	33% (35)	33% (48)
		27% (61)	32% (59)
I am not encouraged to take part in any of the above	25% (83)	16% (17)	15% (22)
		25% (56)	33% (61)

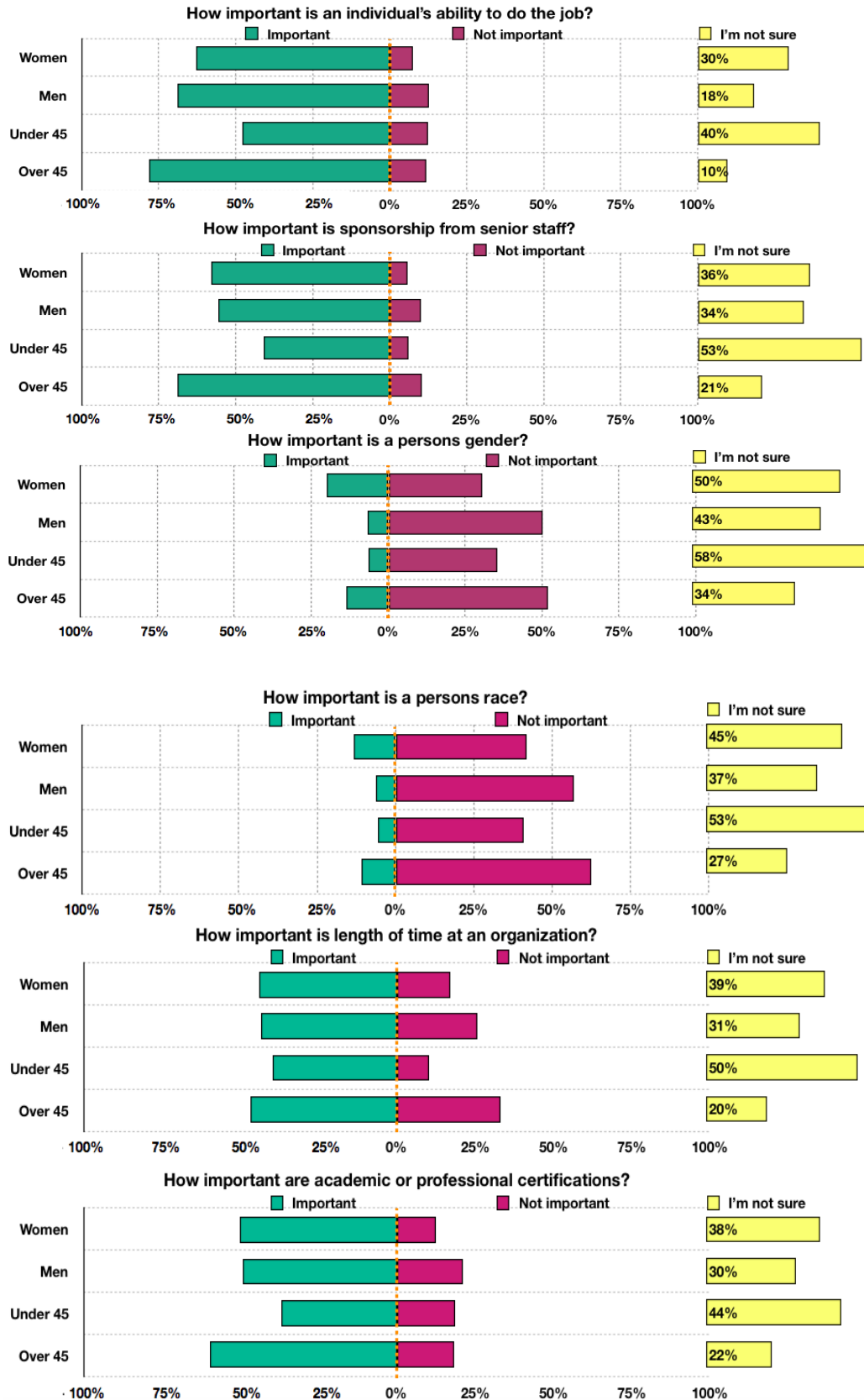


Figure 17: MKO participants' opinion on the factors that determine advancement (promotions/raises/bonuses) at their organization, presented by gender and age group.

Organizational bias

MKO participants were asked to assess if all skill types were equally valued (outreach, technical, administration), and if part-time/flexible working affected career advancement. Finally, they were asked if gender affected pay at their organization. The results, split by the gender identity of the participant, are presented in Figure 18.

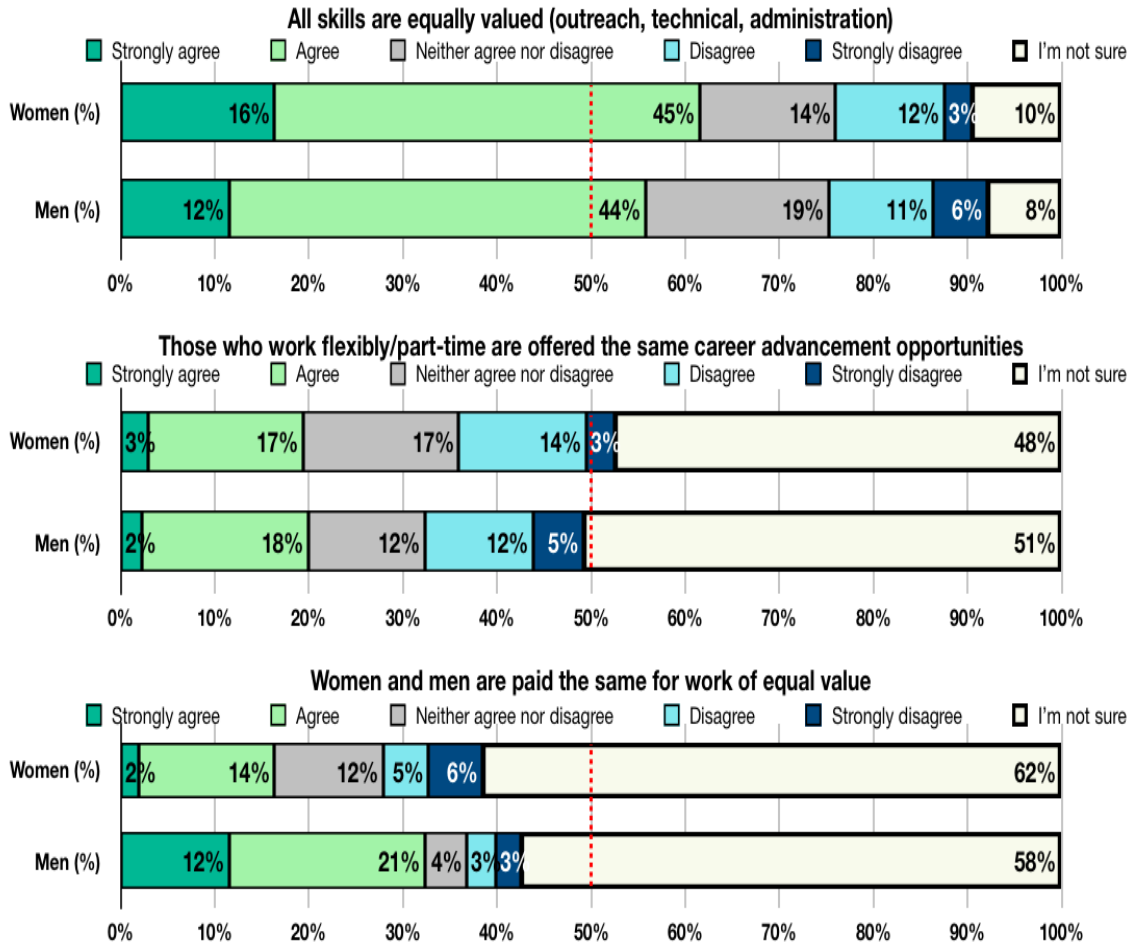


Figure 18: MKO participants' opinion on how their organization values differing skill types and whether working hours or gender affect pay or advancement opportunities, presented by gender identity group.

Workplace advancement: Key findings

- *Most MKO staff are sure that ability, staff sponsorship and academic certifications are important in determining advancement at their organizations.*
- *More men (52%) are certain that gender is not an important factor in workplace advancement, while women are less certain, with 50% unsure if it is important, and 20% of women sure that gender makes a difference, compared to 13% of men.*
- *Similarly, minorities of color (Hawaiian, Islander, Hispanic, African-American) are the only group that had a higher proportion that think of race as a potential consideration in advancement (20%) compared to 8% overall.*
- *Employees under 45 are unclear what their organization uses to determine advancement – more than 50% saying they don't know if the individual factors are important in each case.*
- *While a majority of participants are confident (64%) that all skills (outreach, teaching and administration) are equally valued at their organization, the remainder are uncertain if this is the case – or report that these skills are underappreciated in their institute.*
- *50% are unsure if part-time, or flexibly scheduled staff are offered the same opportunities as full-time employees, with 16% certain part-time staff have less opportunities.*
- *Finally, 68% of women, and 58% of men are unsure if men and women are paid equally for work of equal value. A statistically significant difference is observed between the percentage of men certain that both genders are equally compensated - 34% - to only 16% of women sure this is the case.*

Mentoring

Participants were asked to describe how many senior staff had helped them in getting ahead in their career, and how many of those were men or women. They were then asked whether their gender would affect their future career opportunities.

The aims in this section were to:

- *Understand if mentoring is a common practice at MKOs and whether gender differences are seen in mentors and mentorees.*
- *Gauge perceptions on whether gender affects an individual's chance for future career advancement.*

Access to mentorship

Table 9 presents the MKO participants responses on how many mentors they have had in their career, by age and gender group.

Table 9: MKO participants report on how many senior staff have mentored them in their career, presented by gender+age group. Percentages are of total responses in each gender+age group.

How many senior level staff actively assisted you in getting ahead in your career	Women under 45	Men under 45
	Women over 45	Men over 45
None	22% (10)	24% (24)
	37% (21)	43% (53)
One	27% (12)	19% (19%)
	30% (17)	25% (31)
Two or three	44% (20)	45% (44)
	30% (17)	29% (36)
More than four	6% (3)	11% (11)
	4% (2)	4% (4)

Gender of mentors

Participants were then asked whether these mentors were mostly men, an even mix of men and women, or mostly women - the results are shown in Table 10.

Table 10: MKO participants report on the genders of their mentors, presented by gender+age group response. Percentages are of total responses in each gender+age group.

Of these mentors, were more men, women or about even	Women under 45	Men under 45
	Women over 45	Men over 45
Most were men	59% (23)	73% (69)
	58% (28)	74% (78)
About even number of men and women	28% (11)	22% (21)
	19% (9)	20% (21)
Most were women	13% (5)	4% (4)
	23% (11)	7% (7)

Gender bias in career

Participants were asked a series of questions about their perception of how gender affects career opportunities in general, and then regarding their own careers. No statistically significant differences were seen in responses by men when split into group by age or ethnicity - they will be presented as a single group. The responses from women were seen to vary by both age group and ethnic identity and so these groups opinions are presented individually in Figures 19, 20 and 21.

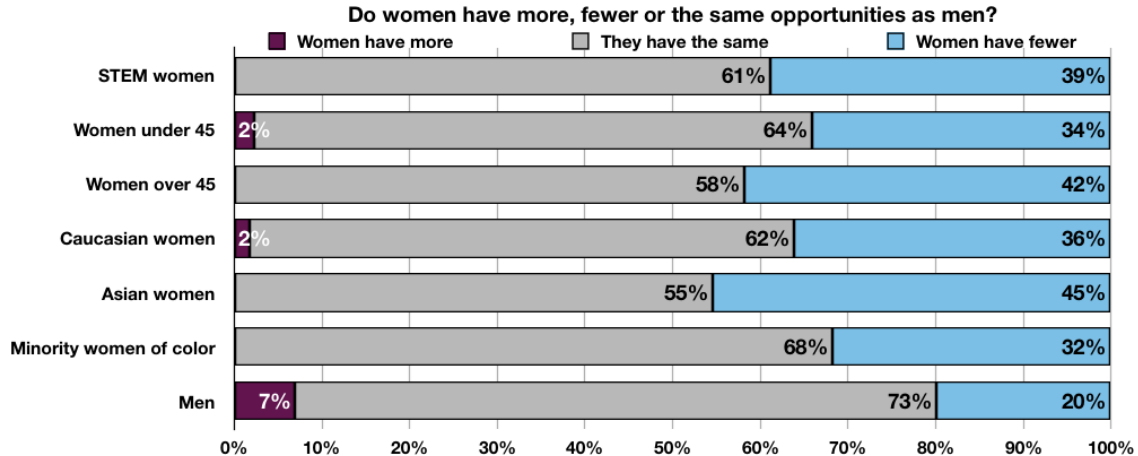


Figure 19: MKO participant opinions on career barriers for women. Responses are presented by group: women in STEM fields, women by age group, women by ethnicity, men in total (no significant differences were seen in responses by men in same groupings).

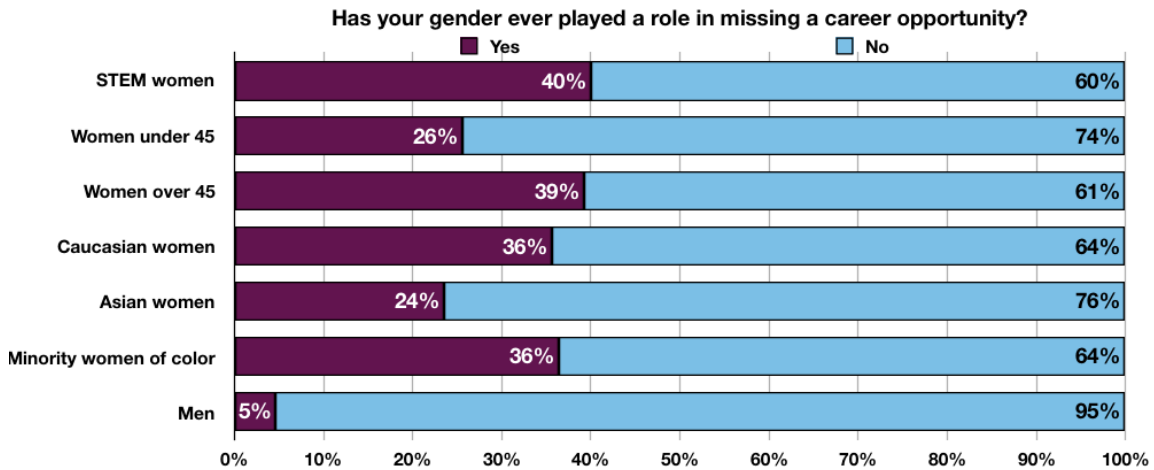


Figure 20: MKO participant opinions on historical career barriers as a result of gender. Responses are presented by group: women in STEM fields, women by age group, women by ethnicity, men in total (no significant differences were seen in responses by men in same groupings).

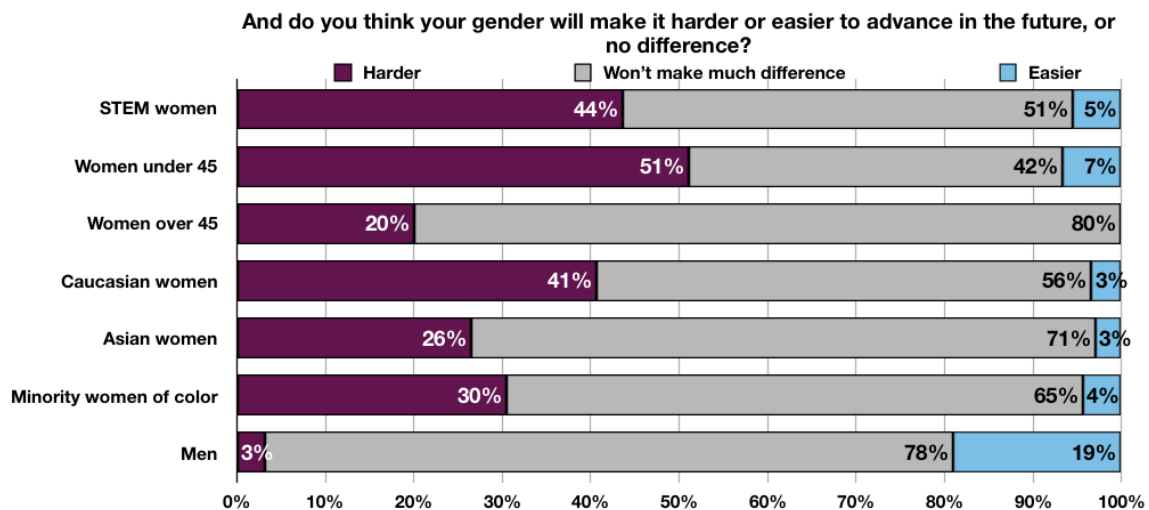


Figure 21: MKO participant opinions on future career barriers as a result of gender. Responses are presented by group: women in STEM fields, age group, women by ethnicity, men in total (no significant differences were seen in responses by men in same groupings).

Mentoring: Key Findings

- A majority of participants have had career assistance from at least one senior staff member 67% - but a third of MKO employees report no mentorship in their current role.
- Most staff (69%) report that these mentors have been predominantly men – with women reporting slightly higher numbers of women mentors than their men counterparts.

- *Women are more pessimistic regarding equal opportunities for women, with 34% believing they have fewer opportunities, compared to 20% of men believing women are disadvantaged – Asian women (45%) and women over 45 (42%) in particular reporting a belief that they have fewer chances as a result of their gender.*
- *Women above 45 report the highest percentage of career opportunity loss as a result of their gender (39%), as well as Caucasian and minority women (both at 36%).*
- *51% of women under 45 believe their gender will detrimentally affect their future career chances.*

Workplace treatment

A series of questions were put to participants regarding their perception of how their organization approaches workplace diversity, and their personal experiences with discrimination.

The aims here were to:

- *Understand if participants have experienced unfair treatment as a result of their gender or other protected characteristic and the ease of access to incident reporting and support practices in MKO organizations*

Gender discrimination in the workplace

Participants were asked how seriously their organization treated diversity and fair treatment: A bare majority of participants felt that their organization treated workplace diversity as a top priority, with 56% of employees saying that this statement fit their workplace at least somewhat well. 30% responded that they didn't feel diversity was a top priority for their organization, and 14% were not sure if it was.

The participants were asked if they had experienced unfavorable treatment as a result of their gender – and if so, the frequency of any such treatment. 52% of women participants report that on at least some occasions they are treated unfavorably as a result of their gender. 57% of women report they have witnessed others treated unfavorably as a result of their gender, along with 44% of men who

reported witnessing similar gender-based mistreatment. 69% of women report being treated poorly outside of their organization as a result of their gender. The results are presented in Figure 22.

Protected characteristic discrimination

Participants were next asked to report if they had been, or been witness to unfair treatment because of a protected characteristic (age, religion, disability, race, sexuality). The results in Figure 23 show these responses, grouped by gender, age, and ethnic identity.

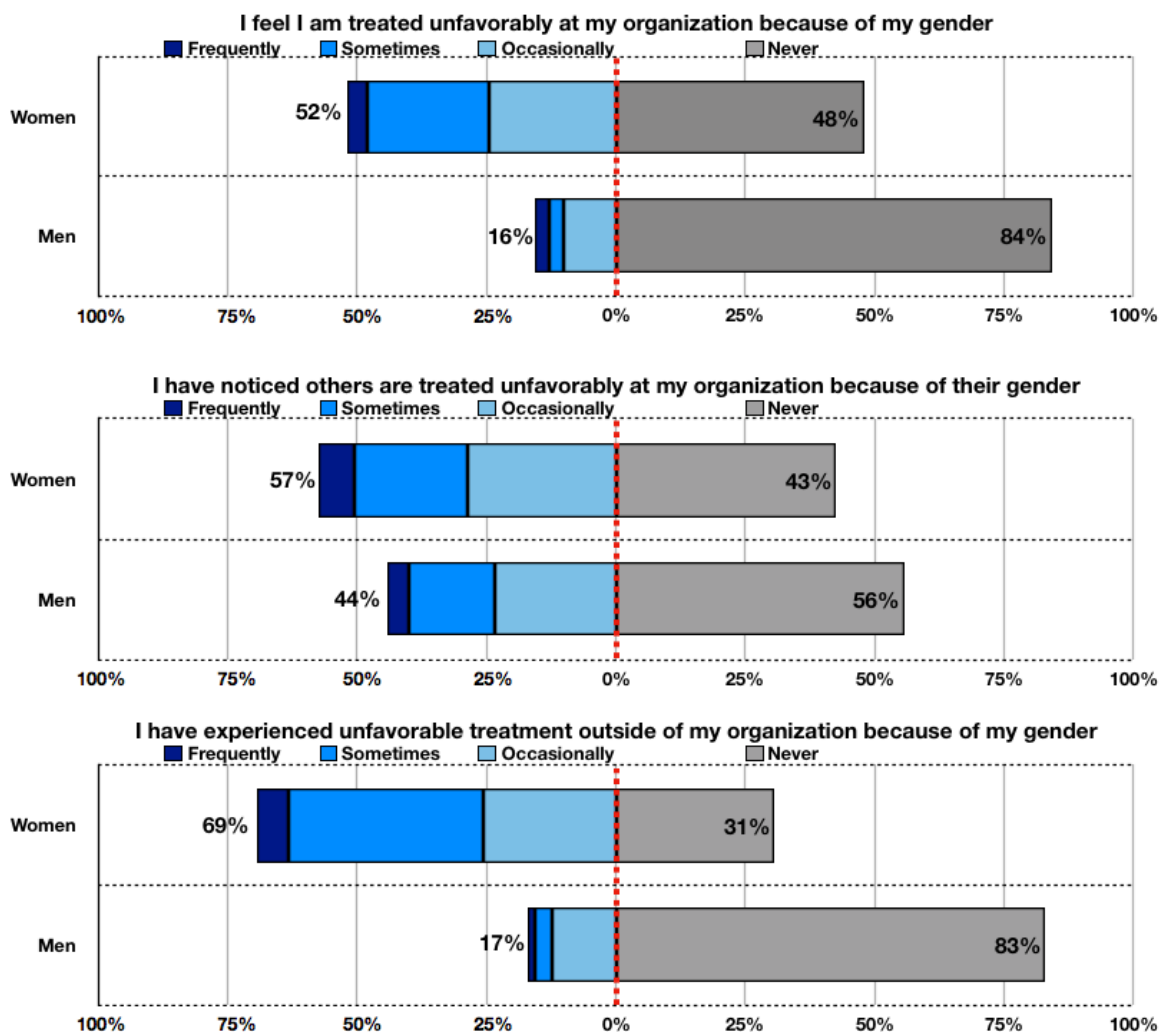


Figure 22: MKO participant experiences of unfavorable treatment within and outside of the workplace as a result of a person's gender. Percentages for "Frequently", "Sometimes" and "Occasionally" are collated into a single percentage in all three subplots.

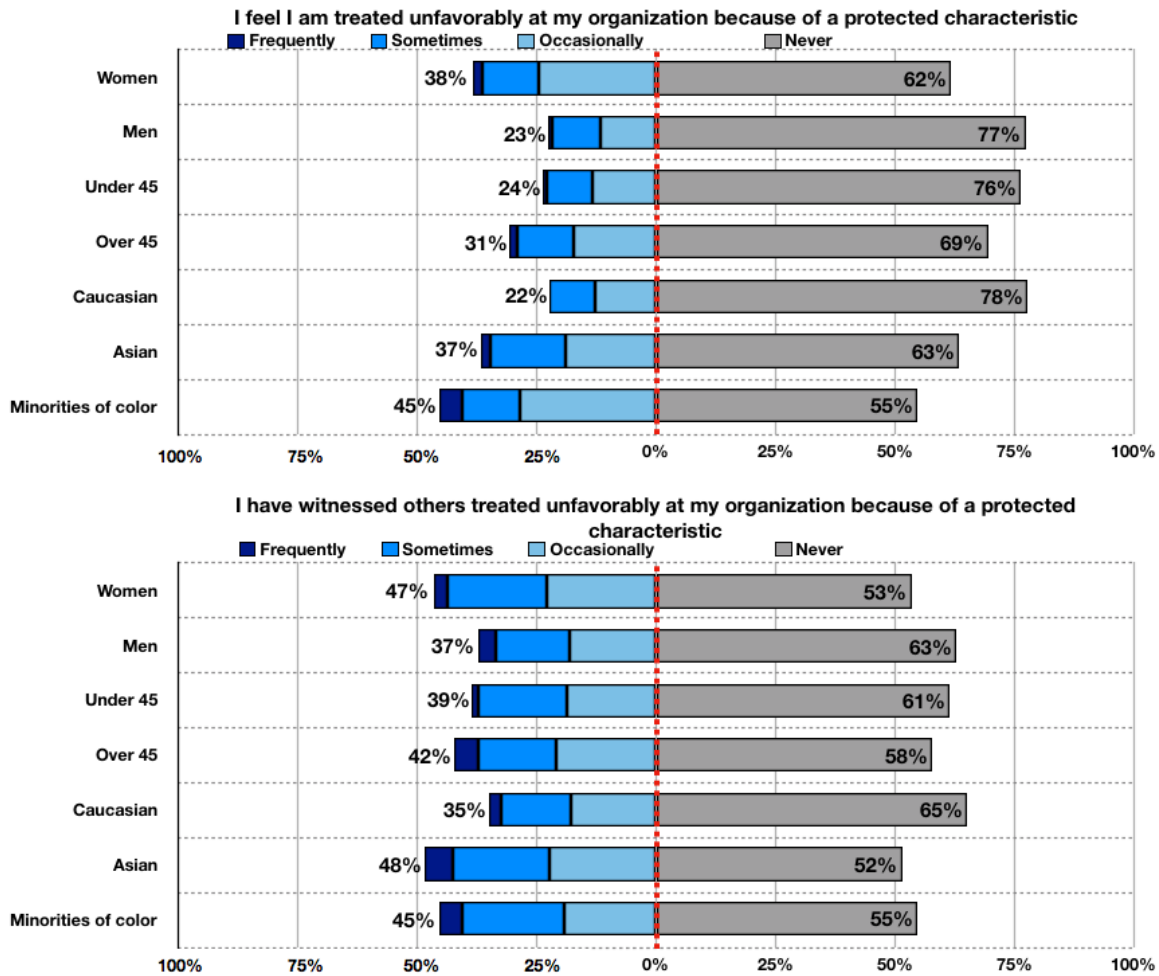


Figure 23: MKO participant experiences of workplace mistreatment because of protected characteristics (including age, race, religion, sexuality), presented by gender, age and ethnic identity groups. Percentages for "Frequently", "Sometimes" and "Occasionally" are collated into a single percentage in all three subplots.

Incident reporting

When asked if they would feel comfortable in reporting an instance where they themselves had been treated unfavorably, the majority of employees reported that they would – 66% (196), with just 17% (50) saying they would not. A further 17% (49) stated that they would not know how to go about reporting such an issue. No strong differences in these responses were seen as in gender, age or ethnic groups. The responses were similar if asked if they would be comfortable reporting an instance of unfavorable treatment that they witnessed occurring to someone else, with 68% (217) saying they would report it, 19% (60) saying they would not, and 13% (42) stating that they would not know how to report such an event.

Finally, participants were asked if their organization made it clear that unsupportive language and behavior is not acceptable. 65% of participants agreed (or strongly

agreed) that this was true at their workplace, with 15% in some or strong disagreement with the statement.

Workplace treatment: Key Findings

- *56% of participants felt that their organization treated workplace diversity as a top priority. 30% responded that they didn't feel diversity was a top priority for their organization, and 14% were not sure if it was.*
- *52% of women participants report that on at least some occasions they are treated unfavorably as a result of their gender, with 57% of women and 44% of men reporting witnessing gender-based unfair treatment in their workplace.*
- *69% of women have experienced gender-based discrimination in their professional career, but outside their current workplace.*
- *45% of minorities report unfair treatment because of a protected characteristic.*
- *A majority of participants (66%) would feel comfortable reporting instances of unfair treatment, though 17% responded that they would not know how to go about such reporting.*

Equity and Diversity initiatives

The participants were asked if they had participated in a range of diversity and equal treatment trainings, or additionally, if they would like to receive training in the same set of topics.

The aims of this section:

- *Understand the current training opportunities for MKO staff in equity and diversity and poll interest in future training initiatives.*
- *Gauge opinion on the level of importance placed on gender diversity by management, managers and the participants themselves.*

Inclusion and Equity training

Figure 24 shows the MKO participants response when asked what inclusion and equity training they have received, or would like to undertake in the future.



Figure 24: MKO participants report on the types of inclusion and equity training they have already received (top) or would like to undertake in the future (bottom), presented by gender group.

Commitment to diversity

When asked whether they thought their organization was doing enough to foster gender diversity, 29% of women participants and 42% of men participants agreed, with 39% of women and 31% of men responding that they felt their organization needed to do more. 38% of women, and 36% of men, agreed that their organization takes positive action to recruit women for posts in which they are currently under-represented. 19% of women and 13% of men disagreed that there was positive action to recruit women into their organization.

Figure 25 shows the opinions of the participants as to how high priority gender diversity is to their Executive, their direct manager and to them individually.

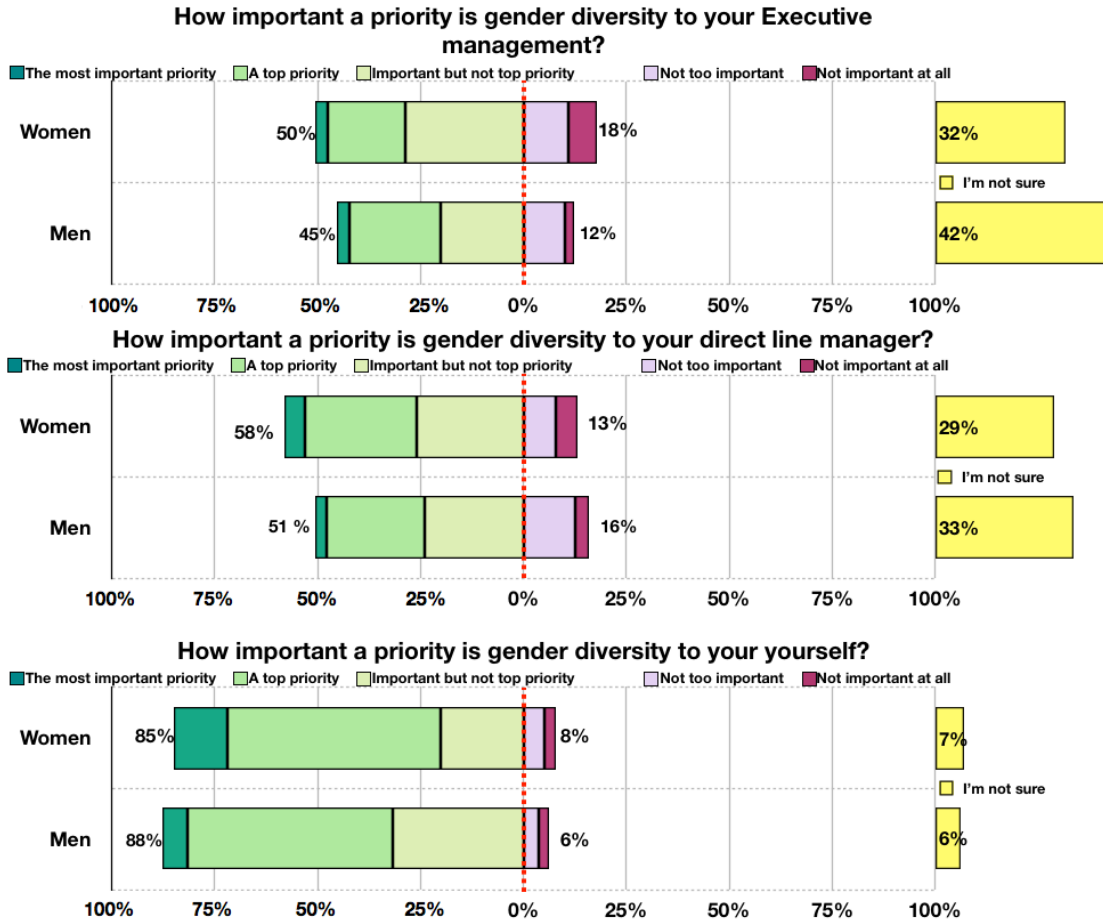


Figure 25: MKO participants provide opinion on the priority importance of gender diversity at the executive, direct management and personal levels, presented by gender identity group.

Diversity and access programs

While 75% of survey participants agreed that gender diversity programs in the workplace were a good thing (78% of women and 72% of men), 50% did not know if their organization provided any such programs, with 36% (43% women, 33% of men) being certain that they did not have any programs of this type. This was also reflected in the low rate of response from MKO employees when asked if they had access to or participated in a range of support programs from part-time or reduced schedules, maternity/paternity leave, childcare subsidies, parental network support or services for sick children (all responding groups reported at less than 5%). A higher number (25%) reported participating in telecommuting (work-from-home) arrangements or leaves of absence/sabbatical (9%). A full 63% of participants had not participated in any of the working support arrangement options listed.

Finally, when asked if they thought that taking a six month leave to handle a family issue would hurt their position at work, 82% of participants agreed that it would

damage their position at least somewhat, with 40% of those believing it would hurt their position a great deal.

Equity and Diversity initiatives: Key Findings

- *Most (>70%) of participants have had training in sexual harassment prevention, but only a minority (<30%) in other diversity initiatives. There is strong interest (57% of women and 47% of men) in training in unconscious bias.*
- *While 75% of survey participants agreed that gender diversity programs in the workplace were a good thing, 50% did not know if their organization provided any such programs, with 36% (43% women, 33% of men) being certain that they did not have any programs of this type.*
- *39% of women and 31% of men responding that they felt their organization needed to do more to foster gender equity and diversity, and just 38% of women, and 36% of men, agreed that their organization takes positive action to recruit women for posts in which they are currently under-represented.*
- *63% of participants reported having no access to flexible working hours and programs to aid parents and people with caring responsibilities.*

Analysis

How many women do we employ at the Maunakea Observatories, and how does this compare with the demographics in other STEM organizations in the United States and across the world?

The Maunakea Observatories workforce has 31% of employees that identify as women (165 out of 530 employees across all islands)– and a matching percentage (31% - 112 women) participated in the survey. Looking only at women in scientific and technical (STEM) roles, this percentage falls to 21%. This is lower than the demographic reported in recent AAS surveys (30%), though higher than the current percentage of women in the IAU membership (16%).

Are we reflecting the demographic make-up of the Hawaii state and the US?

The MKOs employ a higher percentage of Asian staff (25%) than the US average (5%), more closely reflecting the 39% demographic of the State of Hawaii. 6% of MKO participants identified as ethnic Hawaiian, similar to the state average. The percentage of white/Caucasian staff is 62% - far higher than the state average but equal to the US demographic.

How do our demographics compare in various job roles, and in senior roles?

36% of women in MKOs work in administration – where they make up 86% of the total. In the scientific positions, fewer women are present (31%), and notably the numbers of women in management and senior roles drops to just 20%. This is similar to studies in academic institutions in the US, where similar declines are observed. Technical and engineering positions are the least equitable, with just 12% of the jobs across the Observatories filled by women – very much similar to demographics of women in engineering positions across the US (8%). MKOs also do not retain women well: 71% of STEM women have been in their position for less than five years compared to 43% of men.

What are the Observatories doing to enhance equity and diversity?

Participants seemed very unsure if their institutes were doing anything tangible to improve their equity or diversity. Particularly younger staff members (under 45) responded that they did not know what factors their management took into account when determining advancements. 62% of women (and a notable 58% of men) said they did not know if men and women in their workplace were paid the same for work of equal value. 63% of staff report having no access to flexible working hours or support for parents and carers.

Do Maunakea Observatory staff experience career setbacks, or bias in their workplace, as a result of their gender or another characteristic?

40% of MKO women believe that they have fewer opportunities than their male counterparts. 40% of STEM women report having missed career opportunities as a result of their gender. 51% of these younger women believe their future career will be further challenged because they are female. 52% of women in the MKOs report experiencing unfavorable treatment in their current workplace as a result of their gender. Likewise, 45% of staff identifying as an ethnic minority report having received unfavorable treatment because of a protected characteristic (race, religion, sexuality etc).

What are employees' awareness of their organization's practices and attitude to equity and diversity, and what are their own opinions on these concepts?

MKO participants overall want to see better equity and more diversity in their workplaces. They seem generally confident that these concepts are a priority for their organizations and management, but very unsure if, and how, any plans to improve equity and fair treatment are being put into practice.

How can we do better?

The response rate of 67% to the survey, along with the committed attitudes and working habits of the MKO participants, shows the strong interest people have in their organizations and their desire to make them better. This survey has created an opportunity for dialogue and discussion on diversity and inclusion – and it is clear that our community would like to have that conversation.

Key Recommendations

- **Establish baseline demographics:** by its nature as a voluntary survey, the demographics this survey provides are not complete. *Internal tracking at each organization of gender balance and diversity is necessary.* Once done, this allows comparison over time, as initiatives on equity and diversity are implemented, to measure improvement and successes. Any demographic tracking should include not just current staff numbers, but also the genders of job applicants at the initial, shortlist and hiring stages: many comments made in the survey included concerns that shortlists for open positions included few to no women.
- **Improve communication from senior management:** key findings in multiple survey themes showed a lack of understanding, particularly from younger staff, on the factors that determined career advancement as well as the initiatives and priorities, if any, of their organization and their executive regarding equity and diversity and how they are implemented in practice. This communication should also include information on how to report instances of mistreatment, as there is still a significant minority of staff who are unsure of how to go about such reporting, and uncertain if such reporting will be acted upon.
- **Provide mentorships:** more formal and structured mentoring of junior employees has been shown to enhance job satisfaction and improve performance and retention. MKOs are, as a whole, failing to retain women at mid- and senior-levels of experience. Providing young women with mentors

(and ideally, women mentors) has been shown to be a critical support structure when navigating career advancement.

- **Enhance training:** a majority of MKO participants indicated interest in further training in ways to improve workplace inclusion. The strongest interest was a request for training in unconscious bias. Increasing training in unconscious bias, inclusion practices and workplace fairness, is a strong recommendation from the survey results.

We have gender imbalance throughout our organizations – most obvious in our technical fields, and at senior scientific and management levels. Hiring practices need to be reviewed and improved to entice more women applicants, and internal supports enhanced to retain them once they are hired. Executives are encouraged to look at successful initiatives (through organizations such as the Athena Swan and Pleiades Awards in the UK and Australia, respectively, that can be used as templates) as well as seeking input from their staff regarding ways to improve equity in workplace treatment and opportunities.

Maunakea is a unique community – we have a dedicated and committed staff from a range of backgrounds and experience. This survey can provide a way to open up a conversation within, and between the individual organizations that make up our community that will in practice, lead to better experiences for our staff both individually and as a whole. This survey is not a beginning, or a solution, but it can be a catalyst for change. Change for the better.

Acknowledgements

The survey team would like to thank the Maunakea Observatory community for their strong support of this initiative, as evidenced by the commitment of their time to respond to the survey, and for the honesty and thoroughness of their responses.

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