



DIALOGUES WITH OUR FUTURE ANCESTORS
An Inquiry into the Well-Being of MA'O and Kauhale
Youth Leadership Training Program Participants 2003–2020

OLA / Health Outcomes Brief

This brief covers the OLA/health outcome learnings from MA'O's *Dialogues with Our Future Ancestors* alumni survey project. Briefs are also available for education, workforce, socioeconomic and community connectedness outcomes, as well as the YLT experience, and evaluation process learnings. The YLT is a holistic program; for a thorough understanding of the program and its interrelated outcomes, we encourage you to refer to the other briefs, and to the report in its entirety, all posted on our website.

DIALOGUES SUMMARY

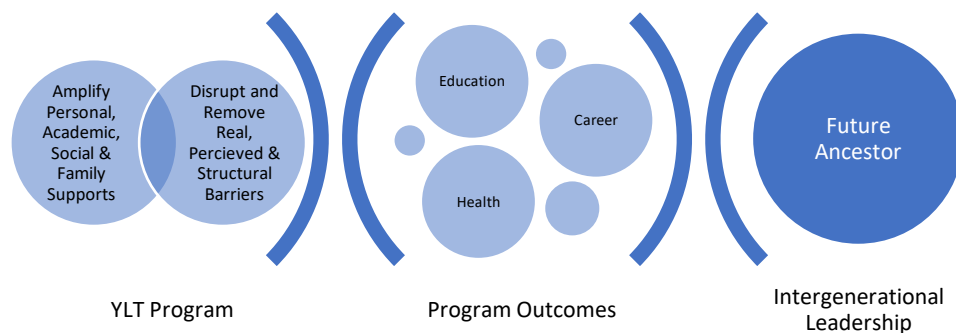
Since its founding in 2001, MA'O Organic Farms (MA'O) has witnessed that investments in the connection of youth to land and in the empowerment of youth leadership generate health, sustainability, and resilience with and for the community. In 2020 MA'O partnered with a team of evaluation experts and academic partners to develop and deploy a multi-faceted 'alumni survey' with the intention of thoroughly and systematically analyzing the effects of its core Youth Leadership Training (YLT) college internship program on participants, and by extension on the community. Our goal was to investigate the hypotheses embedded in MA'O's theory of change regarding the immediate and cascading individual and communal changes that stem from educating and empowering youth.

The Dialogues With Our Future Ancestors project was grounded in MA'O's long-held practice of inquiry, reflection, and refinement: **the feedback loop for our kuleana to our future ancestors.** It was undertaken as a community-based participatory research (CBPR) project, through which MA'O staff, evaluation experts, and academic researchers contributed their unique expertise and experience. This application of the practices of makawalu (seeing through many perspectives; literally 'eight eyes') and kilo (direct observation, generally as a practitioner) affirmed much of MA'O's experiential knowledge, while productively complicating some standing assumptions, and inviting new questions and perspectives.

YLT INTERNSHIP PROGRAM & THEORY OF CHANGE

MA'O's theory of change posits that a social enterprise can mimic the strengths of an 'ohana (family) by providing material, intellectual, and emotional support, educational resources, and workforce training. The YLT program helps youth find their purpose, connect with their culture and history, develop knowledge and skills, grow and mobilize personal and professional networks and partners, and pursue educational and workforce opportunities that lead them, their families, and the community toward cultural, social, economic, and spiritual resilience. This grows **future ancestors** dedicated to leadership, rooted to place, and committed to their community.

Figure A YLT Theory of Change



The YLT program encompasses two program tracks housed in separate educational and enterprise settings: MA’O Organic Farms (an organic farm and home to the majority of YLT interns, referred to as “MA’O”) and Searider Productions (a digital media initiative at Wai’anae School, referred to as “DMED”). Together, these two programs are called the Kauhale. The Kauhale YLT interns from both MA’O and DMED receive comprehensive educational and social wrap-around services, which include counseling, academic advising, and referrals to other social services. They also receive financial support in the form of a monthly stipend and tuition waivers for University of Hawai’i, Leeward Community College (LCC). All Kauhale YLT interns in both the MA’O and DMED program tracks participate in a ramp-up program at MA’O Organic Farms and receive ongoing programmatic support from MA’O education staff. The overlapping two-year cohort structure is core to the program structure: an intern starts as a novice, looking up to the ‘elder’ interns for guidance, expertise, and proof of what is possible, after which they in turn progress into the elder role and take on kuleana (responsibility) for the success of those who follow.

STUDY METHODOLOGY¹

The MA’O Alumni Study comprised four components: two focus groups, an online questionnaire, one-on-one interviews, and the collection of biometric data and biospecimen samples.

The **total YLT alumni population (n=315)** is made up of YLT participants in Cohorts 1-12.5, regardless of how long they stayed in the program and whether they received their associate degree.²

The **alumni questionnaire respondents (n=62)** includes all those who provided a complete response to the online survey questionnaire. This represents **20%** of the total alumni population. The demographic differences between the sample and parent alumni groups suggest that the questionnaire results may not generalize to all YLT participants, particularly those who stayed in the program for a shorter duration, did not attain a post-secondary degree, did not elect to stay on at MA’O for further internship or staff opportunities, or participated in DMED.

The **interviewees (n=21)** did one-on-one interviews in addition to completing the online survey. They represent **7%** of total alumni population. The interviewee population was more likely to have graduated with a degree and to have stayed at MA’O longer, which may have skewed the interviews to reflect a generally more positive interpretation of the YLT program experience.

Comparisons are made throughout the analysis between the alumni questionnaire respondents (n=62) and a **Wai’anae peer group (n=157)**. The Wai’anae peer group aligns closely with the alumni population across the key characteristics of age, gender, household income, and household size.

¹ The complete description of the study methodology can be found in the Process Brief, and in the full report.

² Some participants in Cohorts 13 and up were still active in the program at the time of the project, and as a group they could not yet be considered to have completed the YLT. Members of C13 and up who had already left the program were invited to participate.

OLA & HEALTH IN THE YLT CONTEXT

Ola, or holistic health, is defined here as the well-being of mind, body, and spirit. The OLA health pillar at MA'O is grounded in the provision of three inter-related resources: 1) 'ōhana (family) – the source of fundamental resources for optimum social and economic well-being; 2) Iōkahi – the origin of the values base for optimum spiritual, cultural, and emotional well-being; and 3) 'āina – natural resources that yield physical sustenance, self-sufficiency, and well-being. Many facets of ola, including cultural, social, and emotional well-being, have long been woven into the YLT experience. In particular, the reciprocal relationship between youth and 'āina, that which feeds, and the related concept and practice of food sovereignty, have been foundation to the YLT experience since MA'O's inception. The program provides an environment where fresh produce is celebrated, prepared, and eaten together; youth are also encouraged to take home surplus produce for free, increasing their access to and the affordability of healthy food. YLT participants are supported through curriculum and mentorship to develop agency vis-a-vis their personal and family health, and to build self-awareness and develop practices that improve their emotional and mental well-being. In recent years (since cohort 12), the YLT curriculum has evolved to more explicitly engage with ola and physical health, driven in part by the findings of the Maui Ola study (2017-ongoing).

The Maui Ola study was initiated to explore the social/health impacts of YLT longitudinally by following participating YLT interns over the course of their internship. Through the study we gathered data about interns' food security, diet/nutrition, health-related behaviors, self-esteem, body mass index (BMI), and diabetes risk as measured by the blood biomarker hemoglobin A1C (HbA1C). Through this analysis we observed changes to specific, validated health metrics, focused on obesity-related outcomes. Preliminary results of the Maui Ola study affirmed that within a year on the farm, YLT participants experience statistically significant improvements to their physical health, particularly a reduction in their risk of contracting Type-2 diabetes.

The Maui Ola study raised a series of additional questions, particularly about the potential persistence of the social, behavioral and health impacts of the YLT program. These outcomes are of particular interest and significance in the context of very high incidences of preventable diseases and hunger prevalent amongst Wai'anae community members. In the following section we explore alumni ola outcomes, framed by the overarching question: **do the positive health impacts of the YLT experience persist for alumni after they leave the program, and, if so, how does this manifest?**

The methodology for this biometric analysis, including the self-reported metrics and biospecimen samples, is described in detail in the full report (pp. 22-23). While there were DMED track respondents to the questionnaire, no DMED alumni provided physical samples; the A1C and microbiome analyses therefore include MA'O track participants only (see full demographic breakdown in the full report on p. 16-17).

At the outset of the alumni survey we were hopeful that we would find evidence of the durability of health outcomes for the alumni after their time in the YLT. However, we are also acutely aware of prevailing environmental, economic, social, and cultural conditions that could erode such gains. Because personal and family health are important aspects of the YLT curriculum, it is anticipated that YLT participants will experience:

- 1) Holistic well-being
- 2) Improved mental health
- 3) Good health-related behaviors
- 4) Improved diet and nutrition
- 5) Lower diabetes risk
- 6) 'Āina connection and food sovereignty
- 7) Improved food security

OLA & HEALTH STUDY RESULTS

Holistic Well-being

Questionnaire Findings

The first health-related item in the questionnaire was an open-ended question that asked alumni to share their own definitions of well-being. Upon coding their responses, we found that more than 60% of alumni shared definitions that included multiple dimensions, which we understand to reflect a holistic understanding of health. Another 10% of respondents articulated well-being in terms of being “healthy,” while 16% discussed the importance of happiness or self-care, foregrounding the role of mental and emotional well-being. (See Table 1.)

“*Eating clean and three times a day with snacks in between. Getting at least a 30 minute exercise in your day. Getting up early and going to bed early to ensure a good nights rest. **Being okay mentally and physically.***
Theme: being healthy (Cohort 1-5)

“*Your mental, physical, emotional and spiritual state is within a place of balance.*
Theme: holistic

Table 1 Alumni Perspectives on Health

Theme	Number of respondents	Percent of respondents
Holistic	33	63%
Being healthy	5	10%
Happiness	4	8%
Self-care	4	8%
Other	4	8%

Mental Health

Given the YLT program’s provision of wrap around support for youth’s total well-being, we anticipated that YLT alumni would exhibit stronger than average feelings of self-worth, and have developed strategies for dealing with setbacks. To learn about YLT alumni’s mental health, we included the widely validated Rosenberg approach to measure respondents’ level of self-esteem, using their self-reported answers to a series of specifically targeted questions.³ We note here that programming has evolved more recently to emphasize social-emotional learning and to include practices grounded in trauma-informed care. However, as this has been deployed from Cohorts 12.5 and up, this is not directly relevant for the vast majority of the alumni population.

“*Well-being to me starts with mental health. It's important to feel encouraged and optimistic about being healthy overall. Our minds are what controls us and we as humans never go a moment without having thoughts. Having some kind of community for mental support is crucial. Humans aren't made to do life alone. **We need to be able to relate with others and communicate how we feel and what we are thinking. This way, we can learn from each other, help each other and come up with a solution to the many problems and issues this life comes with.*** Theme: Other (Cohort 6-11.5)

Questionnaire Findings

Upon comparing the alumni and peer groups’ range of self-esteem values and the proportion of respondents in each self-esteem category, we observed that on average the alumni group reported a statistically significantly higher self-esteem than that of the peer group. (See Table 2 and Figure B.) Notably, we also observed a 6-fold higher proportion of individuals in the “high” self-esteem category among the YLT alumni than in the peer group.⁴ **These results indicate that the alumni group generally exhibit higher self-esteem than that reported among the peer group.**

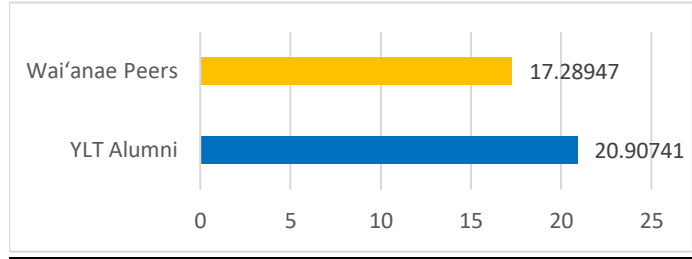
³ Rosenberg's self-esteem scale - <https://www.norton.com/college/psych/psychsci/media/rosenberg.htm>

⁴ In order to rule out the possibility that these differences might be due to the COVID-19 pandemic, we asked the alumni to respond to the same set of self-esteem questions with regard to their post-pandemic (October 2020) state, and their pre-pandemic state (using recall). On average, there was no significant difference between the participants self-esteem at present and before the pandemic.

Table 2 YLT vs. Wai’anae Peers - Self-Esteem

Self-esteem Level	YLT Alumni (n = 62)	Wai’anae Peers (n = 157)
Low	16%	12%
Normal	52%	83%
High	32%	4.9%
Unknown	12	35

Figure B YLT Alumni vs. Wai’anae Peer Self-Esteem



The Rosenberg self-esteem scale:
low (less than 15); normal (15-25); high (25-30)

We also asked alumni how often they experience feelings of sadness or depression (process note: in future these two states should be differentiated, and not collapsed into a single question). 28% of alumni reported being sad less than once a month, 11% about once a month, and 19% a few times a month. 27% of respondents reported being sad a few times a week while 6% reported being sad every day. 8% of individuals declined to answer. (See Figure C.) We then compared the 37% who reported being sad or depressed a few times a week or more with their Wai’anae peers, 35% of whom reported being sad or depressed.⁵ This comparison indicates that alumni do not experience sadness at a statistically different rate than their peers (standard F-test) (see Figure D).

Figure C YLT Alumni Feelings of Sadness or Depression

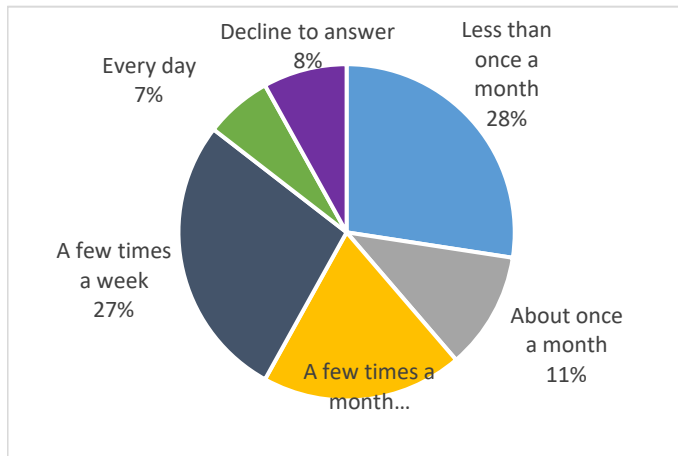
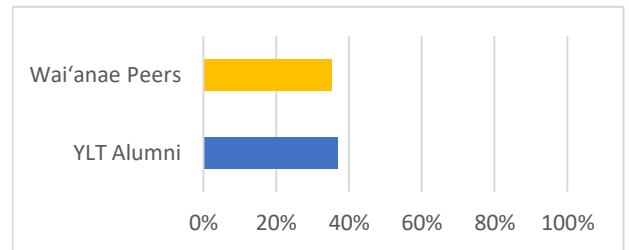


Figure D YLT Alumni vs. Wai’anae Peers - Feelings of Sadness or Depression



Health-related Behaviors

Questionnaire Findings

Alumni were asked several questions regarding health-related behaviors, including the degree and frequency of engaging in the following: physical activity (i.e. exercise), smoking, tobacco use, and alcohol consumption. While there were no significant differences in physical activity between the alumni and Waia’ane peer group, we observed significantly lower consumption of tobacco and alcohol reported among the alumni compared to the peer group. (See Table 3.) These generally lower scores were consistent across all three groups of alumni cohorts,

⁵ The Wai’anae peers were asked a “yes” or “no” question regarding depression/sadness; for this comparison, YLT Alumni reports of feeling sad or depressed a few times a week or more were counted as a “yes.”

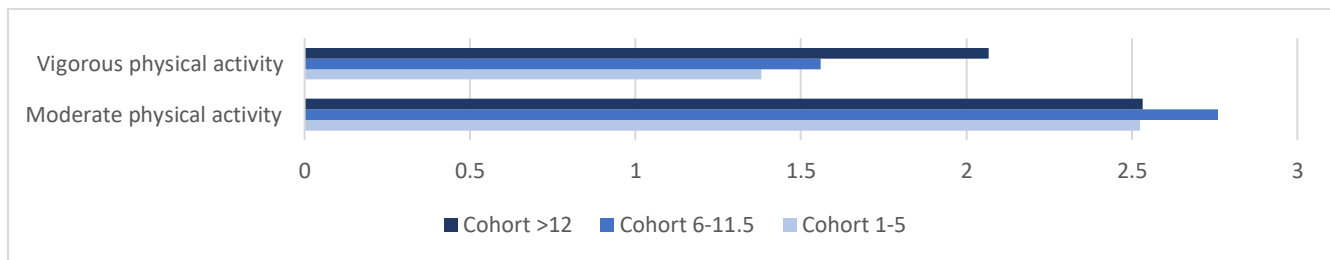
with no significant differences between them, indicating persistence of these behaviors over time. **Together, these data indicate that YLT interns maintain at least some healthier habits than those of their non-YLT peers.**

Interestingly, the younger group of alumni (C12+) reported statistically significantly higher vigorous activity than did the oldest alumni (C1-5), perhaps suggesting a decline in this physical activity over time. (See Figure E.) Given the proximity of the “young” group to the YLT, where intense physical demands are part of the YLT program, and the fact that many of these individuals are still working on the farm in post-YLT capacities, this result is perhaps not surprising and may serve as a control of our approach. This suggests an area for further study in future inquiries.

Table 3 YLT Alumni vs. Peer Health-Related Behaviors

Health-Related Behaviors	YLT Alumni (n=62)	Wai’anae Peers (n=157)	Significance
Moderate physical activity	2.623	2.406	
Vigorous physical activity	1.623	1.716	
Tobacco use	1.836	2.378	***
Alcohol consumption	1.557	2.493	***

Figure E YLT Alumni Physical Activity, By Cohort



Diet, Nutrition & Microbiome

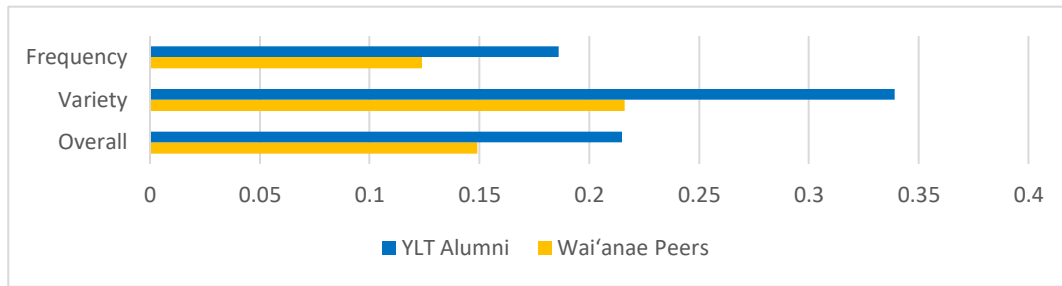
We tentatively hypothesized that YLT alumni would maintain healthier diets than their peers in the Wai’anae community, and in particular that they would eat more fresh fruits and vegetables, even years after leaving the program, given their exposure and access to fresh produce during the YLT. To test this hypothesis we used the validated Healthy Eating Index (HEI) employed in the Multiethnic Cohort Study (UHCC) to evaluate the diet/nutrition of participants based on their self-reported eating habits.⁶ Based on preliminary data of the Maui Ola study and given MA’O’s mission, we focused on the vegetable component of the HEI and created three discrete scores as follows: (1) “overall” vegetable intake (i.e. proportion of vegetable intake relative to overall diet), (2) “variety” of vegetables in the diet (i.e. proportion of specific vegetables comprising those consumed relative to overall vegetable intake), and (3) “frequency” of vegetable intake (i.e. proportion of how frequently vegetables are consumed relative to the overall diet). The overall proportion indicates eating behavior in general. The variety proportion indicates the variety vegetables in the diet. The frequency proportion indicates the frequency of vegetable consumption.

Questionnaire Findings

For each of the metrics related to vegetable intake, we observed that the alumni exhibited significantly higher scores on average than did their peer group. (See Figure F - the index is an arbitrary value.) **These results suggest that YLT alumni tend to consume a larger proportion and variety of vegetables relative to their overall diet than do their non-YLT peers,** even after they no longer receive free produce from MA’O. Notably, there were no significant differences between the cohorts comprising the alumni group, potentially indicating persistence of this relatively higher vegetable intake among YLT interns.

⁶ The Healthy Eating Index-2015 (HEI-2015) was created to assess conformance of dietary intake with the Dietary Guidelines for Americans (DGA) 2015-2020. See: <https://pubmed.ncbi.nlm.nih.gov/29621192/>

Figure F Vegetable Consumption - YLT Alumni vs. Wai'anae Peers T25



By comparing gut microbiome metrics with that of self-reported vegetable consumption (a proxy of fiber intake), we observed that the relative abundance of the *Actinobacteria* phylum significantly negatively correlated with two independent metrics of vegetable consumption (relative proportion of vegetables in the diet and frequency of vegetable consumption in proportion to other dietary factors). This comparison was done using the fecal samples donated by a subset of Alumni participants (n=17). We observed that the relative abundance of the *Actinobacteria* phylum significantly negatively correlated with two independent metrics of vegetable consumption (**variety** of vegetables in the diet and **frequency** of vegetable consumption in proportion to other dietary factors; see Table 5) In other words, higher self-reports of vegetable consumption correlated with lower populations of *Actinobacteria*, which is consistent with prior studies that demonstrate low fiber intake results in enrichment of certain bacteria of the *Actinobacteria* phylum.⁷ The results corroborated participants' self-reported vegetable intake score using their agnostic gut microbiome data. **The comparison therefore suggests that alumni's self-reports were an accurate measure of their vegetable intake, overall diet, and nutrition.**

Table 4 shows the characteristics of the 17 individual Alumni participants who provided fecal samples for gut microbiome analyses. Note that mean values and standard deviations of each metric listed are indicated in the table. BMI and A1C categories are based on the clinical parameters mentioned earlier. Metrics of vegetable consumption, as well as self-esteem results and category listed are as described earlier.

Table 4 Health Metrics for Respondents Who Provided Stool Samples

	Alumni with Microbiome: N= 17
Age	27.4 (5.2)
Unknown	0
BMI results	29.1 (7.1)
BMI category	
Normal	5 (33%)
Overweight	2 (13%)
Obese	8 (53%)
Unknown	2
A1C results	5.86 (1.05)
Unknown	2
A1C category	
Normal	8 (53%)
Pre-diabetes	5 (33%)
Diabetes	2 (13%)
Unknown	2
Race	
Asian	0 (0%)
NHPI	8 (57%)
Other	4 (29%)
White	2 (14%)
Unknown	
Vegetable Consumption	
Veg.diet	0.222 (0.026)
Veg.variety	0.346 (0.020)
veg.frequency	0.191 (0.032)

⁷ Gut Microbes. 2018;9(3):189-201. doi: 10.1080/19490976.2017.1406584. Epub 2018 Mar 13.

Table 5 Negative Correlation Between Vegetable Consumption & Actinobacteria Populations

Variable 1	Variable 2	Correlation	Statistic	p value	Method	p Significance
Actinobacteria	vegetable intake - variety	-0.62	1324.874	0.00747	Spearman	***
Actinobacteria	vegetable intake - frequency	-0.69	1382.123	0.00201	Spearman	***

Interview & Focus Group Findings

In the interviews we further explored if and how the YLT impacted alumni’s families’ health and well-being. Though we did not ask explicitly about dietary changes, close coding of responses revealed that 20 of the 21 interviewees discussed diet changes. **17 of the 21 interviewees spoke about positive personal diet changes driven by the YLT, and more than half reported that their families had experienced positive diet changes.** An additional two interviewees reported that they and their families didn’t change their diet, but that they already ate a healthy diet prior to the program. Many interviewees and ‘ohana dialogue focus group participants directly attributed their own and their families’ increased vegetable consumption to what they learned in the YLT.

“ (...) while I was a part of the YLT, my dad had a lot of health issues. (...) he wasn't able to stay healthy, so I was able to, here and there, put healthy foods within him and then I could see the process actually working. So then **I would explain to him, oh I put a vegetable in, so it's better on your health.** And then he, here and there he would start understanding why I did that kind of stuff and his health actually went up. So, I think that's one of the big things that the YLT actually helped me with. (...) **He lost a lot of weight because I tried to keep unhealthy stuffs away from me and my family.** I mean, it's not, can't get rid of everything but there're some things that doesn't have to be there. (Interview Cohort 12+)

“ before MA'O, I was [unhealthy]. And now, it's like, okay, now, I want to eat healthier. **Make sure that my future kids are going to eat healthier, because I don't want the same health problems that my family has, to go down the line.** So if I can help that, that's awesome. And I learned all of that through MA'O. (Focus Group)

“ [in] my second year they started making snacks. So **it teaches the interns how to incorporate the vegetables and how to cook with it.** (...) It's only the healthy people that know what [the vegetables are], but us local peoples were like, what's a radish, what's a beet, how do you cook with it? And once we eat it... If we eat it raw, it's disgusting. **But the snack has helped incorporate to eat it in your meals. And working at every farmer's market I've been able to ask customers how they eat it, how they cook it. So whatever they tell me, I just cook it for my family and then everyone's like, Oh, this is good. And a majority of the meals it's like an 80 percent vegetables. I barely use meat now. So it helped change our diet.** (Focus Group)

Body Mass Index

Body mass index or BMI (kg/m²) is a measure of risk for obesity that is calculated as the ratio of body weight (in kg) and height (in m²). BMI can be categorized based on risk for obesity as follows: normal (below 24.9), overweight (25-29.9), and obese (more than 30). The initial Maui Ola Study results have not indicated significant change in body mass index (BMI) during the course of the internship. While we did not have a particular hypothesis regarding BMI outcomes for alumni, this metric is a key health indicator and correlates with diet and nutrition choices that we do expect to be impacted by participation in the YLT.

Questionnaire Findings

It is important to note that height and weight from the alumni group were self-reported, unlike that collected from the Peer group participants which were facilitated by researchers. Interestingly, we observed that the overall average BMI among the YLT alumni was significantly lower than that of the Peer group. In addition, we observed

a higher proportion of individuals with normal BMI concomitant with a lower proportion of obese individuals in the alumni group compared with that of the peer group. (See Figures H and G.) **This suggests that the overall risk of obesity is lower among individuals that participated in the YLT compared to non-YLT participants in the same community.**

Figure H YLT Alumni BMI T50

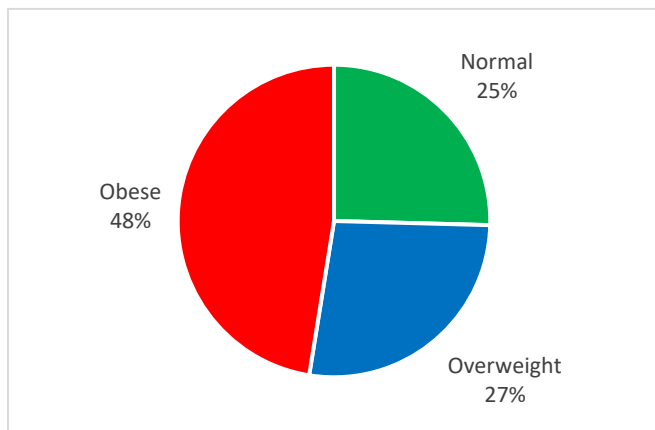
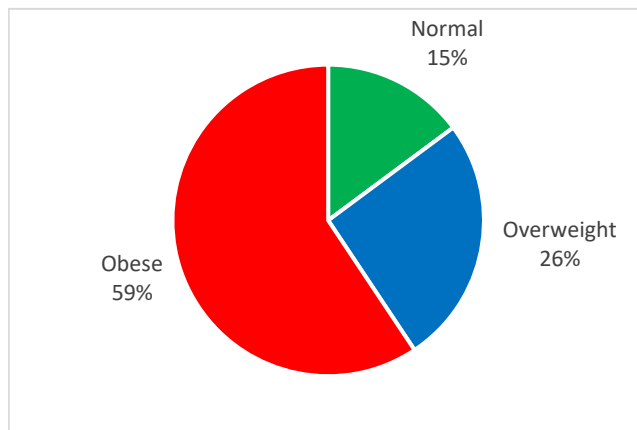


Figure G Wai’anae Peer BMI T50



No statistically significant differences in BMI were observed between the alumni cohorts, which potentially indicates persistence of this generally lower BMI over time. However, we do see a slight deterioration of BMI results (an increase of BMI with age and length of time since participation in the YLT) for members of earlier cohorts. On average the BMI results from the older cohorts (1-11.5) trends towards the average seen amongst the peer group (see Table 6).

Table 6 YLT Alumni BMI Over Time & Vs. Wai’anae Peer

	Cohort 1-5	Cohort 6-11.5	Cohort >12	Wai’anae Peers
BMI	32.22	32.72	28.81	33.41
n	21	24	14	155

Key method: Pair-wise t-test

Diabetes Risk

Given the promising Maui Ola Study data regarding reduction of diabetes risk (as measured through A1C results) during the YLT, we were tentatively hopeful that YLT alumni would continue to demonstrate lower rates of diabetes and pre-diabetes compared to their peers in the Wai’anae community.

The percentage of Hemaglobin A1C measured in the blood corresponds to the level of glucose metabolism and overall glycemic control. The level of A1C has become an important biomarker of type 2 diabetes risk, which can be categorized as follows: normal (below 5.7%), pre-diabetes (5.7-6.4%), and diabetes (6.5% or higher). Using fingerstick measures of blood levels of A1C, we examined differences between the YLT alumni and peer group participants. It is important to note that a subset of Alumni participants (n=22) opted to have their A1C measured. Thus, we adjusted the peer group (n=139) to control for age and gender differences in order to match with this subset of alumni.

Questionnaire Findings

In fact, we observed significantly *higher* A1C levels on average in the alumni group compared to their age/gender-balanced, non-YLT Wai’anae peer counterparts. (See Figures J and K.) We also observed that the proportion of individuals considered pre-diabetic and diabetic based on A1C was higher among the Alumni group than that of the Peer group by approximately 30%. These results conflict with the BMI results discussed above. This may be partly attributed to the 65% reduction of sample size (from 59 reporting their BMI to 22 participants reporting A1C results). This limited data reduces statistical power and confounds appropriate interpretation of these

comparative analyses. For the same reason, the analysis of differences between Alumni cohorts is inconclusive. However, if these results are sustained with a larger population, this raises the prospect that alumni A1C outcomes deteriorate over time, after participants leave the YLT program. This raises questions about why and how this health measure might be eroded. In future analyses, as we gather more longitudinal data, we will have the opportunity to further interrogate persistence across time for discreet individuals.

Figure J YLT Alumni A1C Results

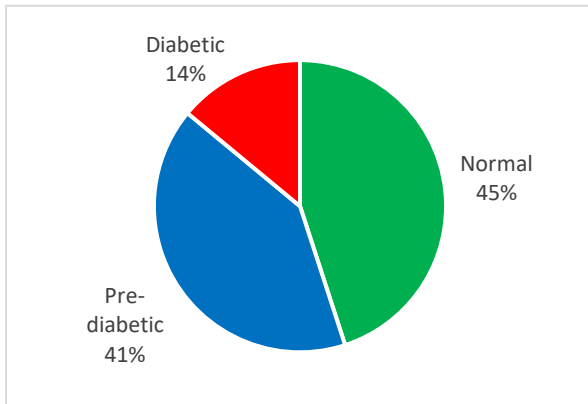
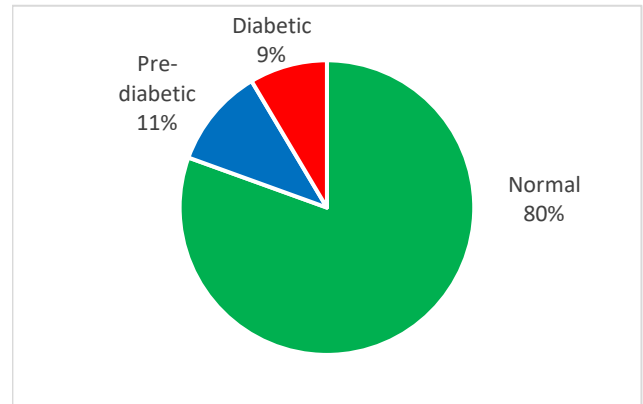


Figure I Wai’anae Peer A1C



‘Āina Connection & Food Sovereignty

Here we discuss ‘āina connection, food sovereignty, and food security as holistic health outcomes, though they also intersect directly with the prior section on socioeconomic outcomes. Food security, food sovereignty, and the underlying state of connection to ‘āina is of particular interest to us given the dismal state of food *insecurity* and related diseases and health disparities in Wai’anae, and because of the great emphasis placed on food sovereignty in the YLT program.⁸ The reciprocal relationship between youth and ‘āina, that which feeds, and the related concept and practice of food sovereignty,⁹ have been foundation to the YLT experience since MA’O’s inception. As noted before, the program provides an environment where fresh produce is celebrated, prepared, and eaten together, and youth are encouraged to take home surplus produce for free, increasing their access to and the affordability of healthy food. YLT participants are supported through curriculum and mentorship to develop pilina with the ‘āina, and agency vis-a-vis their personal and family health. We therefore anticipated that alumni would report significant positive changes in their individual relationship to ‘āina and their commitment to the philosophy and practice of food sovereignty, as well as slightly more modest change in their families’ attitudes and behaviors. These hypotheses were clearly sustained by the questionnaire data and interviews and focus groups, as articulated below. Note the ‘ohana outcomes, which highlight the impact of the YLT experience on interns’ ohana, and indicate the power of YLT youth as agents of change among their families and social networks.

Questionnaire Findings

As we expected, **the vast majority (89%) of respondents stated that their appreciation for ‘āina increased as a result of their participation in the YLT, with 70% reporting a significant increase.** (See Table 7.)

⁸ Though food sovereignty and security are particularly salient to YLT on the MA’O program track, it is also relevant to DMED participants who work at MA’O during their ramp up program.

⁹ While the concept of food sovereignty differs among cultures, in its simplest form it is the inherent right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agricultural systems. Food sovereignty aims to achieve long term food security, as well as community mobilization and maintenance of intergenerational cultural practices and foods. It rejects the globalized food system that prioritizes export-oriented production over the health of the population and land. It lifts up issues of gender/violence against women, environmental sustainability, and indigenous rights with a central theme of anti-colonial struggles, even in post-colonial contexts. <https://viacampesina.org/en/>

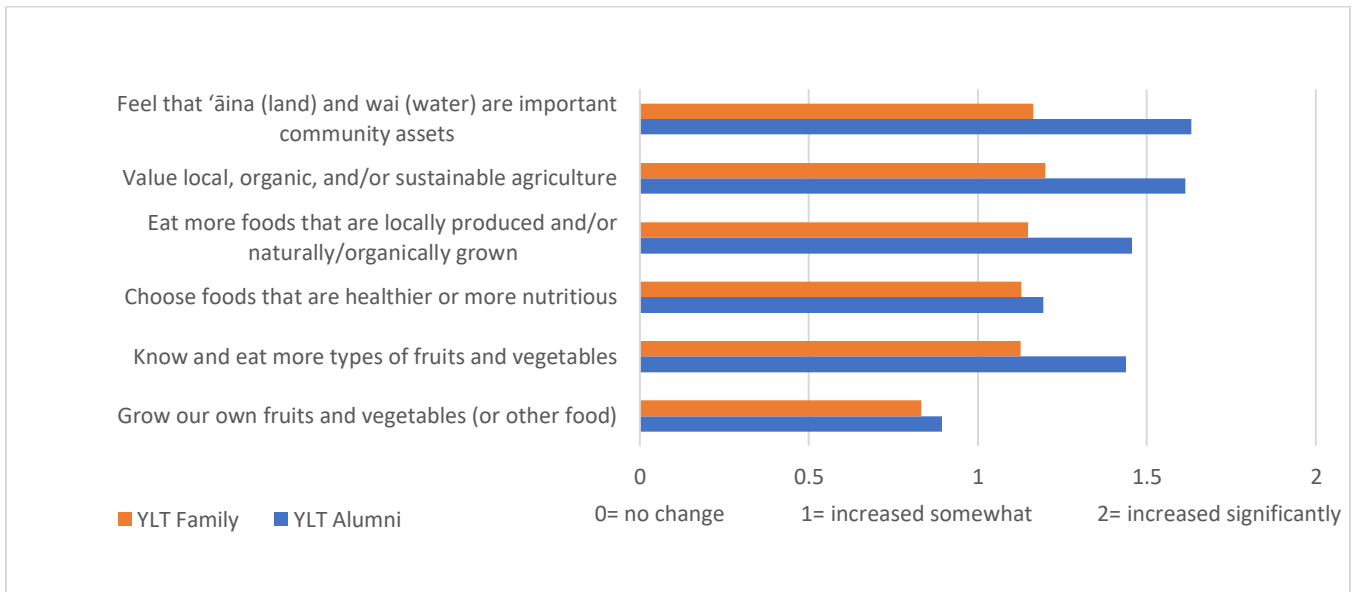
“the one phrase that we use is 'if you take good care of the 'āina, the 'āina will take good care of you.' So, I think that is one thing that I strongly believe in because if you do take even what you need [the 'āina] will also help you because you are gonna take that thing that you need and consume it or use it. So, I think the relationship that I have with the āina is so different than before because I never thought of that. (Interview Cohort 12+)

Table 7 Increased Appreciation for 'Āina

Appreciation of 'Āina	# YLT Alumni (n=62)	% of YLT Alumni
Increased significantly	40	70%
Increased somewhat	11	19%
None	4	7%
Decreased somewhat	1	2%
Decreased significantly	1	2%
Unknown	5	5

Alumni were also asked to describe how their connection and their 'ohana's connection to 'āina and their attitudes and practices regarding food sovereignty changed during the YLT (see Figure K). Respondents identified that the greatest change was in their attitude toward 'āina and wai, and their valuing of local, organic and/or sustainable food. This strong attitudinal shift was also accompanied by self-reported behavioral changes, including eating more locally and/or organically produced food and more fruits and vegetables. Finally, alumni reported a slight increase in their own and their family's growing of their own food. Responses did not differ significantly between MA'O and DMED participant, perhaps indicating that participation in Ramp Up programming at MA'O inculcated similar attitudes among participants in both tracks.

Figure K Increased Alumni & 'Ohana Appreciation for 'Āina



Respondents also reported positive changes in their families on the same measures of 'āina connection and food sovereignty, though at lower rates than their personal attitudinal and behavioral changes (statistical significance noted in Table 8). This once again suggests that while they are in the YLT, youth exert an influence on their family members, thus extending an indirect impact of the program on participants' social networks.

Table 8 ‘Ohana ‘Āina Outcomes

	YLT Alumni	Alumni Family	Significance
Feels that land and wai (water) are important community assets	1.63	1.16	***
Values local, organic, and/or sustainable agriculture	1.61	1.20	**
Eats more foods that are locally produced and/or naturally/organically grown	1.46	1.15	*
Knows and eats more types of fruits and vegetables	1.44	1.13	*
Chooses foods that are healthier or more nutritious	1.19	1.13	
Grows our own fruits and vegetables (or other food)	0.89	0.83	

Food Security

Food security is of particular interest to us given the dismal state of food *insecurity* in Wai‘anae, which is widely understood to be a ‘food desert.’¹⁰ For this analysis, food security was measured using an adapted questionnaire from the USDA Household Food Security survey.¹¹ We compared alumni responses to these standard questions against those of students at the University of Hawai‘i Leeward Community College (n=187).¹² This is not a direct peer comparison, given that the LCC population are all current college students, while many alumni have completed their education and are working full-time. However, it is a similar community by age and geography, and allows for a more direct comparison than any other data set available. Note that the LCC student population is a distinct group from the Wai‘anae peer group referenced elsewhere in this analysis (there is no food security data available for the latter).

Questionnaire Findings

The results show that **the alumni reported a significantly higher level of food security than the LCC group** (Tables 9 and 10). We also observed that the degree of food security reported by the alumni group did not vary significantly amongst the cohorts, suggesting potential persistence of food security over time.

Table 10 YLT Alumni Food (In)Security

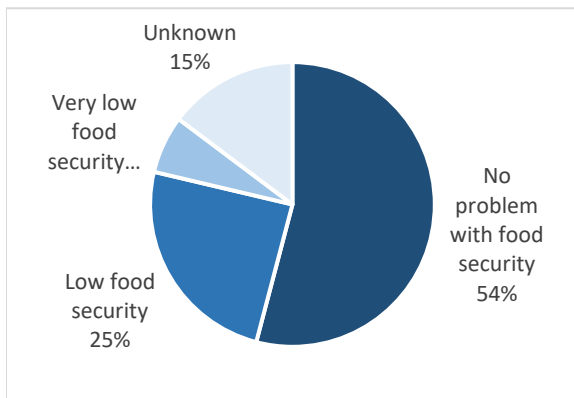
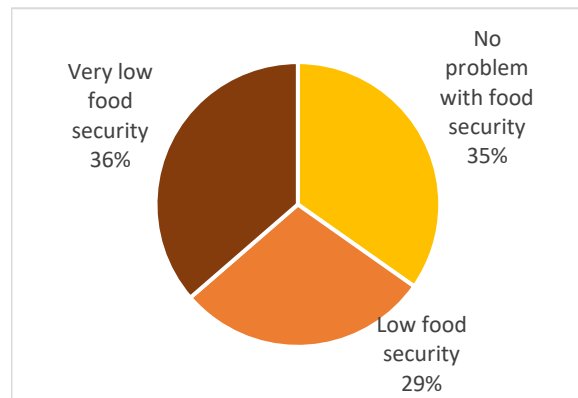


Table 9 LCC Student Population Food (In)Security



¹⁰ Lee, Stephanie, Melissa Oshiro, Laura Hsu, Opal Vanessa Buchthal, and Tetine Sentell. “Public Health Hotline: Neighborhoods and Health in Hawai‘i: Considering Food Accessibility and Affordability.” *Hawaii Journal of Medicine and Public Health*. 2012 Aug; 71(8): 232-237. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3419825/>

¹¹ <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-tools/#six>

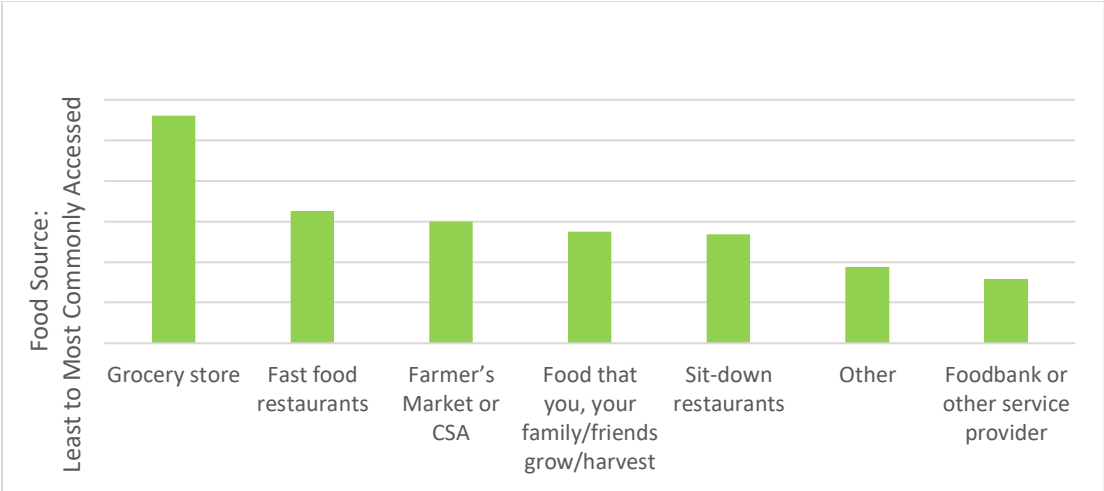
¹² Recommendations to the Office of the President UH System Food Insecurity Committee, 2018

However, it is noteworthy that *a third of alumni still report low to very low food security*. These results appear to coincide with our finding that alumni usage of Supplemental Nutrition Assistance Program (SNAP) benefits (11%) is considerably lower than that of the general Wai‘anae population (34%) (see full report p.48). However, we again note the difficulty of making this comparison due to confounding factors, as those still living with their families might be in households receiving SNAP benefits. Further analysis is necessary to drawn any firm conclusions.

To explore our expectation that alumni would continue to exhibit a strong commitment to food sovereignty after their participation in the YLT, we asked alumni where they currently source their food. Figure L ranks the aggregate alumni sources of food from most to least commonly accessed. Grocery stores were a strong favorite. This was followed by a tight cluster that included: fast food restaurants; farmer’s markets; food grown or harvested by alumni or their family or friends; and sit-down restaurants. This clustering is particularly interesting, as the categories represent such divergent food-related behaviors. Two final categories – other, and foodbanks or other service providers – lagged behind.

As we note in the discussion of career outcomes (pp. 41-45), these outcomes suggest a complex interplay between personal preferences, financial resources, and physical access determined by community. In particular we are left wondering about the impact of structural, environmental factors that impact the 63% of alumni who continue to live in Wai‘anae, where it is challenging to access healthy and fresh food and the majority of dining options are fast food chains. Future analyses should delve further into these questions around food access.

Figure L YLT Alumni Food Sources



Interview & Focus Group Findings

All 21 interviewees reported accessing local food, though they are also accessing non-local foods from places like Costco or the local grocer. While some interviewees described making more of an effort to eat local as much as possible, they were all mindful of where their food comes from (even those that eat local on a less frequent basis). Cross-referencing these responses with alumni’s reports of positive changes in their ‘āina connection and commitment to food sovereignty, we see that the YLT experience is driving a sustained commitment to active participation in the local food economy and community.

We anticipated that alumni who self-identified as buying local food or growing it for themselves would also describe having a strong connection to ‘āina. This expectation was borne out in the interviews; as noted previously, all 21 interviewees reported a local food source and the vast majority (17) indicated a strong connection with ‘āina. More specifically, of the nine people who grow their own food, everyone indicated currently having a strong relationship to ‘āina: five identified having a strong daily life connection to ‘āina and/or

six of them reported a stronger connection because of YLT. Notably, when interviewees were asked about their current relationship to ‘āina, they did not always discuss their current relationship. Rather, they described their current relationship in terms of how YLT changed it. Of the seven interviewees currently involved with MA’O in post-YLT roles, six of them report a strong daily connection to ‘āina. The outlier who did not describe a strong connection to ‘āina responded by describing how YLT impacted their growth of knowledge.

In the ‘ohana dialogue focus groups several alumni articulated how their YLT experience influences their current practice of growing their own food and eating healthy. This also demonstrates their application of farming skills learned in the program.

“ *this year, we actually started gardening, and I am actually putting everything that I learned through MA'O into action now, after what, eight years since I've left MA'O, and it's still with me. (...) And I've introduced a lot of veggies to my husband because he's like, "Oh, I don't really eat healthy foods." His diet was pizzas and instant meals, until I met him and told him, "No, you're going to start eating healthier. (Focus Group)*

“ *when my other half and I first bought our house (...) one of the first things I did was I had him build me some garden beds in the back of our house so that I could start planting our own vegetables because my boyfriend is real big on eating healthy. (...) I enjoy implementing the knowledge I learned from MA'O into my own yard. And it feels great when you know where your food is coming from. And that's what MA'O taught me, the importance of farm to table, and knowing where your food is coming from and what is on your produce. I also feel like MA'O kind of has its own culture. Like the people, the environment, just, you feel a big sense of family. You have a work family, you have a school family. So you have that support in both aspects of life when you're at MA'O. And I think that's why we tend to fall off of that Ohana path because we go our own ways and we're not always together. (Focus Group)*

SUMMARY & DISCUSSION

In summary, our analysis revealed a complex picture of alumni health, with evidence of persistent positive outcomes in areas such as vegetable consumption and BMI, but a comparatively high risk of diabetes. Moreover, the analyses based on biometric data were inherently limited by low rates of participation and small population sizes. Meanwhile, alumni expressions of food sovereignty were very strong, and alumni food security was better than a peer group at Leeward Community College, but still far from ideal. We are left with many lingering and new questions to fuel future inquiries into YLT participants’ long-term health outcomes.

Several overarching themes that emerge in the OLA outcomes are highlighted here:

- There is a complex interplay between youth’s experience in the YLT program and their structural, environmental, and familial context, which can impinge upon and/or bolster individual outcomes. This interplay surfaced repeatedly throughout our analysis, for example in the food security outcomes. We are keen to further explore what programming most effectively and constructively intervenes in these cycles.
- YLT youth exert an influence on their family members, thus amplifying the impact of the YLT program across social networks. This points to the role of social networks, which arose repeatedly throughout our analysis. This was evident in the changes to YLT participants’ ‘ohana attitudes and behaviors in the areas of ‘āina appreciation and food sovereignty practices. It is also reflected in the alumni’s reports of inspiring others to attend college and eat more vegetables. These findings reinforce the promising early findings of the Maui Ola Study that indicated a YLT multiplier effect.
- Given the affirmation from alumni that their appreciation for and connection to ‘āina increased through their participation in the YLT, we note that the range positive outcomes stemming from the YLT may also be attributed to youth’s development of this fundamental pilina with the land itself as ‘ohana.