

CHILDREN'S HEALTHY LIVING PROGRAM



For Remote Underserved Minority
Populations In The Pacific Region



United States Department of Agriculture
National Institute of Food and Agriculture
Agriculture and Food Research Initiative (AFRI)
No. 2011-88001-50536







Children's Healthy Living Program For Remote Underserved Minority Populations in the Pacific Region

Aoloau Prevalence Survey Results



United States Department of Agriculture
National Institute of Food and Agriculture
Agriculture and Food Research Initiative (AFRI)
No. 2011-68001-30335



Table of Contents

I. EXECUTIVE SUMMARY	6
II. CHILDREN’S HEALTHY LIVING PROGRAM (CHL)	10
III. THE CHL TRAINING PROGRAM	14
TRAINING PROGRAM OBJECTIVES	14
TRAINING PROGRAM PARTNERSHIPS	14
TRAINING PROGRAM ACCOMPLISHMENTS	15
LONG-TERM PLANS.....	18
TARGET BEHAVIORS, STRATEGIES, AND CROSS CUTTING FUNCTIONS	22
IV. RESEARCH ACTIVITIES.....	28
CHL RESEARCH AIMS AND DESIGN.....	28
RESEARCH METHODS.....	28
STUDY DESIGN.....	28
<i>Selection of Communities</i>	28
<i>Longitudinal Study</i>	29
<i>Selection of Participants</i>	30
V. AOLOAU COMMUNITY REPORT	34
SECTION 1. CHILD DEMOGRAPHICS	38
<i>Sex</i>	38
<i>Age</i>	38
<i>Racial and Ethnic Heritage</i>	39

<i>Child's Birth Place</i>	40
<i>Language Child Speaks</i>	40
SECTION 2. CHILD ANTHROPOMETRIC MEASUREMENT RESULTS.....	44
<i>Body Mass Index</i>	44
<i>Prevalence of Overweight and Obesity of Study Children in Aoloau</i>	44
<i>Abdominal Obesity</i>	45
<i>Acanthosis Nigricans (AN)</i>	45
SECTION 3. CHILD NUTRITION AND DIET REPORTS.....	48
<i>Fruit and Vegetable Intake</i>	48
<i>Water</i>	49
<i>Sugar-Sweetened Beverages (SSB)</i>	50
SECTION 4. PHYSICAL ACTIVITY FROM ACCELEROMETERS.....	56
SECTION 5. SCREEN TIME.....	59
SECTION 6. SLEEP.....	66
SECTION 7. MEDICAL.....	74
SECTION 8. EARLY LIFE AND FEEDING OF CHILD	78
<i>Birth Weight</i>	78
<i>Early Feeding Pattern</i>	78
SECTION 9. HOUSEHOLD DEMOGRAPHICS AND MEASURES.....	82
<i>Relationship</i>	82
<i>Marital Status</i>	82
<i>Household Size and Multi-generation Households</i>	82

<i>Education</i>	83
<i>Employment Status of the Caregiver Participants</i>	83
<i>Household Income Level</i>	84
<i>Religion</i>	84
<i>Food Security / Resource Availability</i>	85
<i>Culture</i>	86
VI. COMMUNITY ASSESSMENT RESULTS	92
<i>Section 1. Food Resources and Physical Activity Environment</i>	92
<i>Section 2. Assessment of Parks</i>	93
<i>Section 3. Assessment of Schools</i>	104
<i>Section 4. Assessment of Churches</i>	111
<i>Section 5. Food Availability and Marketing Form</i>	119
<i>Section 6. Walkability Survey</i>	133
FOOD COST SURVEY (FCS).....	134
VII. CONCLUSION / SUMMARY OF PREVALENCE STUDY	140
REFERENCES / SOURCES OF INSTRUMENTS	141



Executive Summary



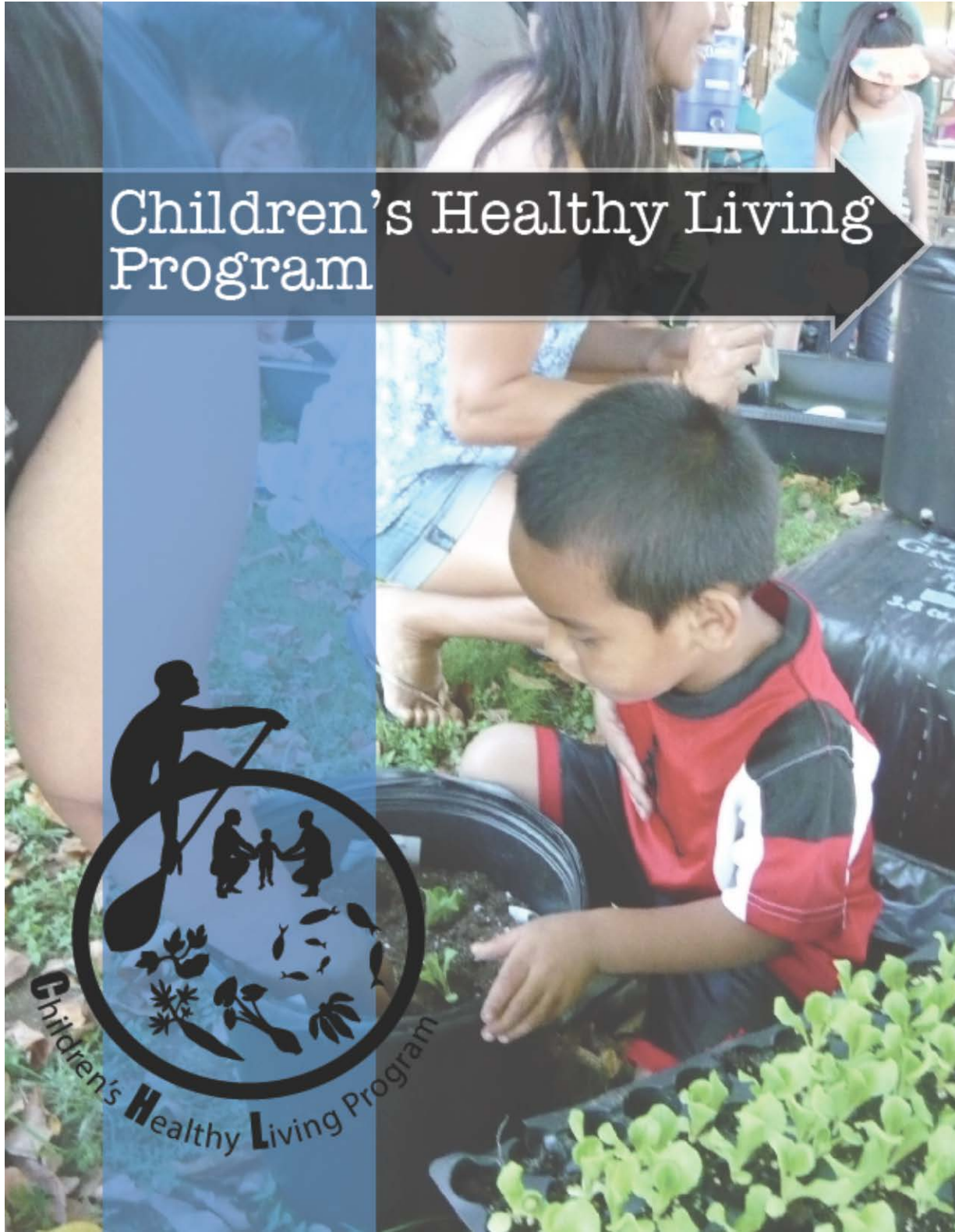
I. Executive Summary

Introduction to the Report

The CHL program utilizes three major strategies towards its goals: 1) training, 2) extension – outreach, and 3) research - intervention. The purpose of this document is to report on the measures of these three strategies in your community. It includes information about CHL training, outreach and sustainability activities, and the research descriptive results of the Children’s Healthy Living Program Survey at the individual and household level and the results of the community level assessment. The community level assessment utilizes the Community Assessment Toolkit (CAT) -- which comprises of assessments about the availability of food resources, parks, play spaces, and walkable streets – and a Food Cost Survey. Results of the intervention trial will be presented in a separate report following this one.

If you have any questions about this report, please contact *Rachel Novotny* at novotny@hawaii.edu or 808-956-3848.

Thank you for your interest and efforts for children’s health!



Children's Healthy Living Program



II. Children's Healthy Living Program (CHL)

The Children's Healthy Living Program for Remote Underserved Minority Populations in the Pacific Region (CHL) is a partnership among the remote Pacific jurisdictions of Alaska; American Samoa; Commonwealth of the Northern Mariana Islands (CNMI); the Federated States of Micronesia (FSM), the Republic of the Marshall Islands (RMI), the Republic of Palau; Guam; and Hawaii to study childhood obesity among Pacific children, ages two to eight years old.

The program is funded by the United States Department of Agriculture (USDA), National Institute of Food and Agriculture, Agriculture and Food Research Initiative (Grant no. 2011-68001-30335). CHL is coordinated from the Department of Human Nutrition, Food and Animal Sciences in the College of Tropical Agriculture, at the University of Hawaii at Manoa with contracts to the University of Guam, University of Alaska Fairbanks, American Samoa Community College, Northern Marianas College, and fees for nutrition analysis services conducted at the University of Hawaii Cancer Center.

The goal of CHL is to help to create a social, cultural, political, economic, and physical environment in the Pacific Region that supports active play, physical activity, and eating healthy food, in order to promote health. In partnership with participating communities, our mission is to elevate the capacity of the region to build and sustain a healthy food and physical environment to help maintain healthy weight and prevent obesity among young children in the Pacific region.

CHL strived for the following behavior targets:

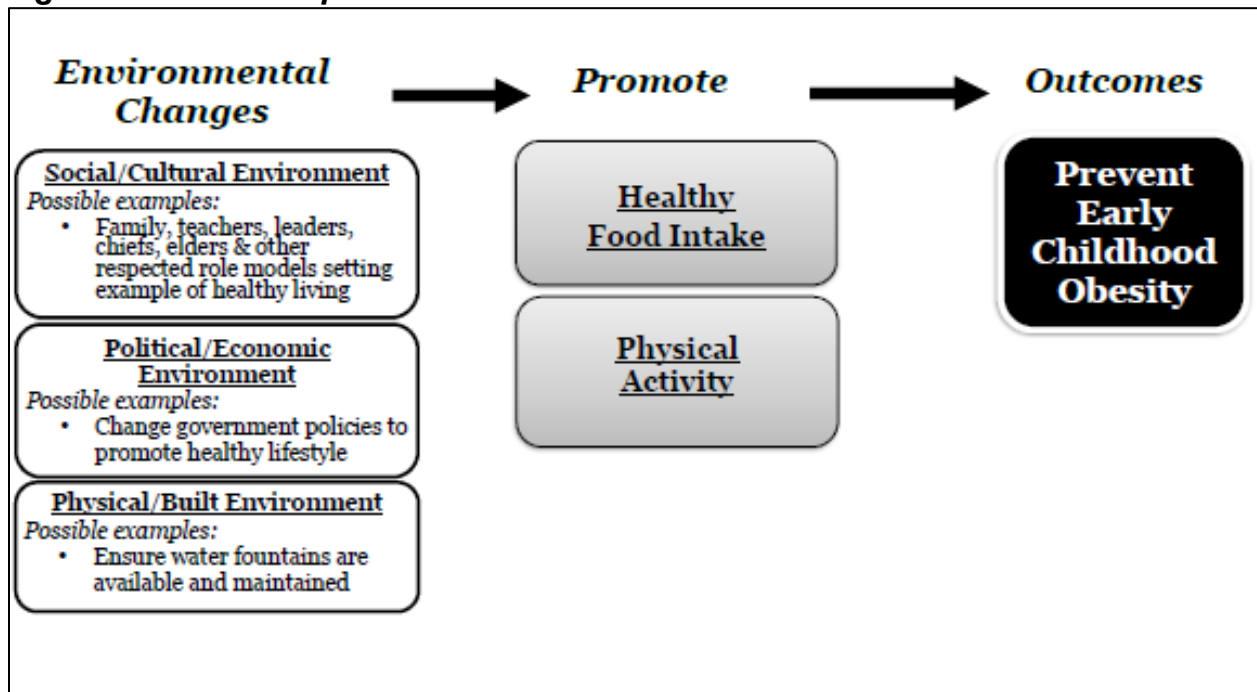
- 1) Lower prevalence of excess weight and waist circumference for height
- 2) Increased sleep
- 3) Reduced consumption of sugar-sweetened beverages (SSB)
- 4) Higher fruit and vegetable intake



- 5) Higher water intake
- 6) Reduced TV/video viewing
- 7) Increased physical activity
- 8) Lower prevalence of acanthosis nigricans (AN)

Figure 1 illustrates CHL's model to influence multiple aspects of the environment to promote healthy food intake and physical activity in young children ages two to eight years old (Braun et al., 2014).

Figure 1. CHL Conceptual Model



The CHL Training Program



III. The CHL Training Program

Training Program Objectives

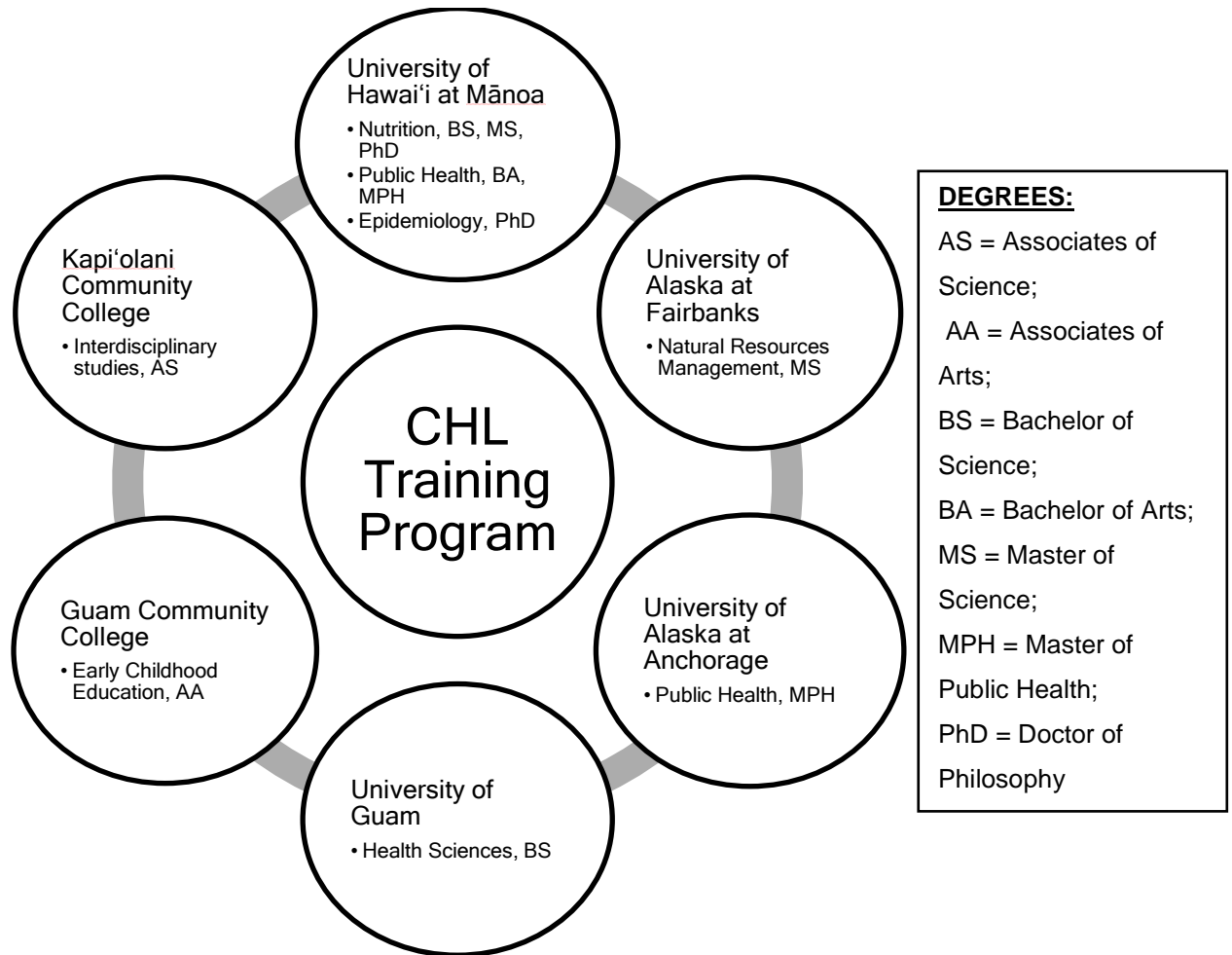
The development of the CHL Training Program (CHL-TP) was an essential component of CHL's multilevel approach to prevent childhood obesity. Approximately one third of the program's resources were invested in training. The CHL-TP's first objective was to train 22 United States Affiliated Pacific Region students in child obesity prevention through selected academic degree programs. A second objective was to enhance the students' academic education with training on childhood obesity prevention strategies and tools, through the offering of culturally appropriate and regionally relevant obesity prevention-related courses and programs.

Training Program Partnerships

The CHL-TP was a collaborative effort with institutions across the Pacific. Students selected for the program have attended courses at the University of Hawai'i at Mānoa, the University of Guam, Guam Community College, Kapi'olani Community College, and the University of Alaska at Fairbanks and Anchorage (Figure 2).

Partner jurisdictions created selection committees who screened and interviewed student applicants and identified the top candidates for the scholarship awards. Two students from each of Alaska, American Samoa, CNMI, Chuuk (FSM), Guam, Hawai'i, Kosrae (FSM), Pohnpei (FSM), the Republic of the Marshall Islands, the Republic of Palau, and Yap (FSM) were selected for a scholarship to enroll in a degree program at one of the partner institutions.

Figure 2. Institutions, Academic Program Areas and Degrees in the Children’s Healthy Living (CHL) Training Program



From: Fialkowski MK, et al. Indigenous Workforce Training by the Children’s Healthy Living Program (CHL) to Prevent Childhood Obesity in the Underserved US Affiliated Pacific Region. *J Health Care Poor Underserved*. 2015; 26(2 Supplement): 83-95.

Training Program Accomplishments

The CHL-TP developed a series of six 1-2 credit seminars that addressed the multiple causes of obesity and provided evidenced-based strategies for childhood obesity prevention. Conducting seminars using an online collaborative approach provided an opportunity for all the CHL trainees to engage in distance learning together while

strengthening their bond as a cohort and their ties to CHL and the region. The CHL-TP also partnered with the University of Hawai'i at Mānoa Public Health Program to allow CHL Trainees to take an indigenous health seminar as a part of their CHL seminar experience.

In addition to the CHL-TP seminar curriculum, CHL modified curriculum for the Food Science and Nutrition (FSHN) course, The Science of Human Nutrition (FSHN 185), offered both through the University of Hawai'i at Mānoa and the University of Hawai'i Outreach College. FSHN 185 utilized an online platform, which allowed for flexible and adaptive nutrition education delivery across the vast region of the Pacific and beyond. The modifications broadened the curriculum to reflect the unique environment and cultural diversity of the Pacific region. New modifications incorporate nutrition education with aspects of commonly consumed food and their significance in societal structure. To further support this Pacific adapted introductory nutrition course, a Pacific Food Guide was developed to help students enrolled in FSHN 185, to better connect the traditional foods of the Pacific with concepts of nutrition.

Other curriculum and education materials developed by the CHL-TP included a comprehensive workshop to provide standardized measurement training to staff and field workers conducting measurements in anthropometry, dietary intake, physical activity, and acanthosis nigricans. The measurement training workshops conducted by CHL were successful in standardizing over 100 measurers in 5 years across the Pacific region from Alaska to Micronesia. Workshop materials will continue to be utilized for standardization of educators and staff conducting regional measurements such as Head Start staff and community workers and will be part of future curriculum being planned.

Students accepted into the CHL-TP conducted a CHL project in their home jurisdictions that supported childhood obesity prevention. Students at the graduate level blended these projects with their final theses and dissertations. All trainees presented their projects and budgets to a selected project committee for approval prior to

implementation. Upon completion of their project all students submitted a formal write up and conducted an oral presentation. Examples of projects completed by graduates of the CHL-TP are outlined in Table 1.

Twenty-four students participated in the CHL-TP. Two Trainees dropped out of the program after their first year, due to personal reasons. The two vacant scholarship positions were offered to two other qualified Trainees from those respective jurisdictions. Two Trainees were released from the program due to poor performance. To date, 6 students (5 graduate and 1 undergraduate) have completed the CHL-TP and attained their degrees (Table 1). Two graduate-level Trainees from CNMI and Alaska are expected to complete their MPH degrees in the Spring of 2016 while 2 graduate level Trainees from American Samoa and CNMI, working towards a PhD in Epidemiology and an MPH, respectively, are expected to complete their degrees in Summer of 2016. Three undergraduate Trainees from American Samoa, Chuuk, and Kosrae are expected to graduate in Spring 2016 with Bachelor's degrees in Public Health (2) and Nutrition (1), respectively. One undergraduate Trainee from Yap is expected to graduate with a Bachelor's degree in Nutrition in Summer 2016. Four undergraduate Trainees from Pohnpei, Palau, Chuuk, and the Marshall Islands are expected to graduate in Fall 2017 with Bachelor's degrees in Health Science (3) and an Associate degree in Early Childhood Education (1), respectively.

Table 1. CHL Training Program Graduates by Jurisdiction, Degree Type, and Project Description

Student Name	Jurisdiction	Degree Name/Type	Project Description
Tanisha Aflague	Guam	PhD, Nutrition	To examine the willingness to try fruit and vegetables (F&V) and F&V intake among children, 3-12yrs, attending a cultural immersion camp compared to children from a camp without cultural immersion
Monica Esquivel	Hawaii	PhD, Nutrition	To build evidence on the effectiveness of Child Care Center wellness policies that promote intake of nutrient-dense food, healthy eating habits and nutrition education to improve child diet intake and prevent childhood obesity in Hawaii
Lenora Matanane	Guam	MS, Nutrition	To test whether access and availability to fruits and vegetables in food stores is associated with childhood overweight/obesity prevalence in selected Guam communities
Ashley Morisako	Hawaii	MPH, Native Hawaiian and Indigenous health	To outline the community engagement process instilled to effectively implement and evaluate a garden-based learning curriculum targeted for preschoolers in Hawaii in order to reduce and prevent childhood obesity
Ron Standlee-Strom	Alaska	MS, Natural Resource Management	To determine factors mediating the delivery of effective nutrition education as perceived by educators and Alaskan program participants
Trisha Johnson	Pohnpei	BS, Food Science and Human Nutrition	To determine traditional fruits and vegetables consumed by young children in Pohnpei, Federated States of Micronesia

PhD = Doctor of Philosophy; MS = Master of Science; MPH = Masters of Public Health; BS = Bachelor of Science

Long-term Plans

The CHL program provided guidance in identifying other funding to Trainees who did not complete their degree programs within the life of the CHL grant. The CHL-TP also continues to serve as a source of professional collaboration and career networking for

the Trainees. The CHL-TP plans to do long-term follow-up of the Trainees to gather information on the career trajectory of graduates.

Curriculum developed by the CHL-TP will continue to be adapted for offering through multiple venues. The Pacific adapted online FSHN 185 has been included as one of the options offered to students at the University of Hawai'i at Mānoa in the Fall, Spring, and Summer semesters. This class has also been designated as meeting the Hawaiian, Asian, and Pacific Issues General Education Focus area for the University of Hawai'i system, including the University of Hawai'i Outreach College. The nutrition education resource, the Pacific Food Guide, has also been developed into a web resource available for free at www.manoa.hawaii.edu/ctahr/pacificfoodguide

The series of seminars developed for the CHL Trainees on the causes of childhood obesity and evidenced-based strategies for childhood obesity prevention are currently being adapted into a comprehensive distance-learning platform for offering through a CHL Summer Institute. The online platform of the CHL Summer Institute will allow for a wider audience to benefit from its unique and important content. The CHL Summer Institute will offer various courses and modules for credit and non-credit through the University of Hawai'i Outreach College. The University of Hawai'i Outreach College allows for non-University of Hawai'i students to access this unique training opportunity at in-state tuition rates. For further information on the CHL Training Program please see the following resources:

- Fialkowski MK, et al. Indigenous Workforce Training by the Children's Healthy Living Program (CHL) to Prevent Childhood Obesity in the Underserved US Affiliated Pacific Region. *J Health Care Poor Underserved*. 2015; 26(2 Supplement): 83-95.
- CHL Training Program available at:
<http://www.chl-pacific.org/trainingeducation/program-overview>

CHL Community Intervention



Target Behaviors, Strategies, and Cross Cutting Functions

CHL's goal was to achieve healthy weight among young children (ages 2 to 8 years) by promoting **six target behaviors**:

1. Increase consumption of fruits and vegetables, preferably locally grown fruits and vegetables
2. Increase physical activity
3. Increase water consumption
4. Increase hours of sleep
5. Decrease consumption of sugar sweetened beverages
6. Decrease screen time

To promote these target behaviors in communities with young children, the CHL team conducted community meetings, reviewed literature, and worked together to identify strategies and activities that would be appropriate for young children and their caregivers. The culture and environment of children and families also were taken into account.

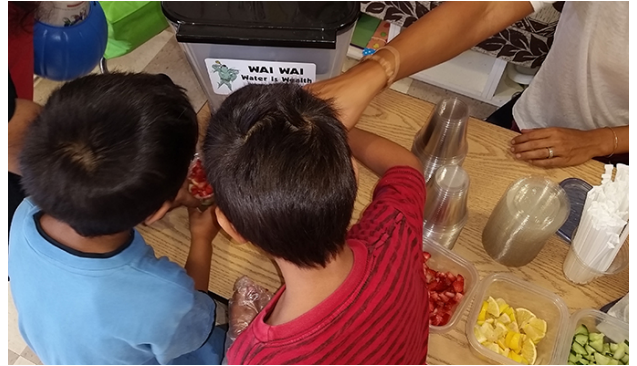
Based on these data, CHL jurisdictions agreed to engage in **six strategies** to promote the target behaviors.

1. Introduce, enhance, and support policy for healthy eating and physical activity of 2-8- year-old children
2. Engage 2 to 8-year-old children in growing and eating local healthy foods
3. Train and support role models to promote CHL's six target behaviors
4. Increase accessibility of environments for safe play and physical activity for young children
5. Increase accessibility of drinking water for young children

6. Provide other education and training related to CHL's six target behaviors

These six intervention strategies were collapsed into **four cross-cutting functions**, signifying the four action areas of the intervention:

1. Strengthen and actualize school wellness policies
2. Partner and advocate for environmental change
3. Promote the CHL message
4. Train trainers (capacity building)



Children making fruit-infused drinking water

Specific recommended activities under each cross-cutting function were provided. Relationships between these activities and the CHL's behavior-change objectives are shown in Table 2. Specific activities conducted in Kagman are shown in the Areas of Focus Column.

Table 2. Relationship of Areas of Focus to CHL Cross-Cutting Function and Target Behavior

Cross-Cutting Function	Area of Focus (Activities)	Target Behavior Add
1) Review Assessment Data for the Policy and Physical Environment related to the 6 CHL behaviors		
a) Review preschool (Head Start) wellness policy assessment data to identify training needs.	Preschool Wellness Policies & trainings	All behaviors (Increase physical activity; Increase sleep; Decrease consumption; Decrease s
i) Review preschool wellness policy assessment data to identify policy gaps		
ii) Address policy gaps with preschool administration	Preschool Wellness Policies & trainings	All behaviors
iii) Assess policy implementation quality identify strengths and weaknesses)	Preschool Wellness Policies & trainings	All behaviors
iv) Work with preschool administrators to address weaknesses in policy implementation	Preschool Wellness Policies & trainings	All behaviors
b) Review CAT (community assessment toolkit) data related to the physical environment to identify areas for advocacy.	Community Gathering Spaces	Increase fruit & vegetable Increase physical activity Increase water consumption Decrease sugar sweeten
i) Assess the physical environment using the CAT		
ii) Review CAT data related to the physical environment to identify areas for improvements and advocacy	Alliance; Community Gathering Spaces	Increase fruit & vegetable Increase physical activity Increase water consumption Decrease sugar sweeten
iii) Improve CAT-indicated physical activity environments	Community Gathering Spaces	Increase fruit & vegetable Increase physical activity Increase water consumption Decrease sugar sweeten
iv) Advocate (with partners, stakeholders, role models, coalitions, etc.) for CAT-indicated physical activity environment changes	Alliance; Community Gathering Spaces	Increase fruit & vegetable Increase physical activity Increase water consumption Decrease sugar sweeten
2) Partner and Advocate for Environmental Change		
a) Work with existing community organizations and coalitions and/or form new coalitions to advocate for:	Alliance; Community Gathering Spaces	Increase physical activity
i) Better access to parks that are safe and inviting		
ii) Better access to clean water	Alliance; Community Gathering Spaces	Increase water consumption
iii) Safer environments for walking, biking, etc. (e.g., bike lanes/racks, sidewalks, greenways)	Alliance; Community Gathering Spaces	Increase physical activity
iv) Better food placement in stores	Alliance; Community Gathering Spaces	Increase fruit & vegetable Increase Water consumption Decrease sugar sweeten
v) Gardens and hydroponics	Alliance; Community Gathering Spaces	Increase fruit & vegetable
b) Partner with existing entities to purchase or obtain sponsorship for:		
i) Water in the preschools and childcare centers		
ii) Gardening supplies for preschool kids	Community Gathering Spaces	Increase fruit & vegetable
iii) Sports/play equipment for preschool kids		
iv) Campaigns and messages	Na Ki'i Ola	All behaviors

Cross-Cutting Function	Area of Focus (Activities)	Target Behavior Add
3) Promote the CHL Message		
a) Support Role Models to deliver CHL messages in various ways (using the CHL role model curriculum as a guide)	Support Community Role Models	All behaviors
b) Enhance existing social marketing campaigns in the intervention communities, and/or develop low-cost local social marketing campaigns related to the 6 CHL behaviors	Na Ki'i Ola	All behaviors
c) Advertise CHL or other activities that promote 6 CHL target behaviors	All areas of focus	All behaviors
4) Train the Trainers		
a) Train individuals to promote gardening in preschools and communities	Workshops	Increase fruit & vegetable
b) Train individuals to lead interactive, hands-on sessions to promote the 6 CHL behaviors	Workshops	All behaviors
c) Train individuals to organize and lead family-based activities that support the 6 CHL behaviors (park clean-ups, hikes, cooking sessions, etc.)	Workshops; Community Gathering Spaces	All behaviors
d) Provide Technical Assistance (TA) to preschool and childcare staff on wellness policies	Preschool Wellness Policies & Trainings	All behaviors
e) Train childcare providers and preschool teachers in curricula related to 6 CHL behaviors	Preschool Wellness Policies & Trainings	All behaviors
f) Train role models (community champions, role celebrities, role models)	Support Community Role Models	All behaviors

CHL Research Activities



IV. Research Activities

CHL Research Aims and Design

CHL measured two to eight year-old children to identify young child overweight and obesity, acanthosis nigricans, and health behavior information about sleep, physical activity, screen time, eating of fruits and vegetables, and consumption of sugar-sweetened beverages and water.

Research Methods

Study Design

The cross-sectional CHL study design collected data on body size, functional outcomes of obesity (acanthosis nigricans), food intake, physical activity, lifestyle behavior which included screen time, and demographics (baseline or prevalence). These were measured through anthropometry (height, weight, and waist circumference), Food and Activity Logs, questionnaires, accelerometry, and visual inspection (of the neck).

Data were collected between October 2012 and September 2013 in American Samoa, Alaska, Commonwealth of the Northern Mariana Islands (CNMI, Guam and Hawaii, and between October 2013 and June 2015 in FAS.

CHL research included data from the Federated States of Micronesia (Yap, Chuuk, Kosrae, and Pohnpei), the Republic of the Marshall Islands, and the Republic of Palau; referred to collectively in CHL as the Freely Associated States (FAS), and all other CHL jurisdictions -- Alaska, American Samoa, CNMI, Guam, and Hawaii.

Selection of Communities

Communities were identified in Alaska, American Samoa, CNMI, Guam and Hawaii using the 2000 U.S. Census tract data (U.S. Census Bureau). In the FAS, 2010 country census data were used to inform selection of sites. The community eligibility criteria included population size of >1000 (except for FAS), >25% of the population of

indigenous/native descent (except 15% in Alaska due to no targeted census tract within the CHL catchment area with a population of more than 1000), having more than 25% indigenous /native ethnic groups, and >10% of the population under age 10 years. Additional selection criteria included adequate settings for measuring children (e.g., schools), reasonable accessibility for the CHL team, and geographic representation for FAS.

Longitudinal Study

For the study of the effectiveness of the CHL intervention in American Samoa, CNMI, Guam and Hawaii, communities were selected as matched pairs. Four communities were selected (two matched-pairs). Two communities were selected (1 matched-pair) in Alaska. The matching included similar criteria as above, as well as community characteristics such as access to food stores and ethnic distribution. In each pair, one community was randomly assigned to intervention and the other to a delayed optimized intervention (community will receive intervention at the end of the main study). Two additional non-matched communities (third and fourth for Alaska and fifth and sixth for other jurisdictions) were selected from the eligible list of communities to serve as temporal indicators.

A second round of measurement occurred around 24-months from the baseline in Alaska, American Samoa, and Commonwealth of the Northern Mariana Islands (CNMI), Guam, and Hawaii to examine if CHL intervention activities in those jurisdictions were effective.

Smaller amounts of data were collected from the “temporal” communities. The temporal communities served to show changes in BMI over time, in communities that did not have any CHL activities.

This report includes only the baseline data. The results of the CHL-wide intervention study examining changes between baseline and 24-month data will be available later in a separate report.

Selection of Participants

Recruitment activities involved schools and other community venues and activities. Recruitment took place at Head Start sites, preschools, day care centers, kindergartens, WIC sites, community health centers and other appropriate venues (e.g., parks and community recreation centers). Recruitment efforts, led by CHL staff in each jurisdiction, involved close collaboration with community liaisons (e.g., teachers, school staff, program directors, matai, mayors) to enhance participation. The teams in all jurisdictions tailored the recruitment strategies to work effectively with the stakeholder organizations while meeting recruitment goals of CHL.

*NOTE: The following numbers are based on those who consented, rather than those who completed, the measures.***

Table 1: Number of Participants Consented in each Jurisdiction for CHL Research

Number of Participants Consented in each Jurisdiction for CHL Research	
Jurisdiction Communities	Number Consented
Alaska <i>Anchorage, Fairbanks, Kenai, Mat-Su Valley</i>	713
American Samoa <i>Fagaitua/Pagai/Amua/Auto/Utusia, Leloaloa/Aua, Onenoa/Aoloau/Alao, Aoloau/Aasu</i>	978
CNMI <i>Koblerville/San Antonio, Oleai, Kagman, San Roque, Saipan</i>	924
Guam <i>Yigo, Yona, Agat, Sinajana</i>	885
Hawaii <i>Nanakuli, Waimanalo, Hilo, Wailuku, Kauai, Molokai</i>	988
CHL Intervention Study Data (total)	4,488

Freely Associated States	
Jurisdiction Communities	Number Consented
Pohnpei <i>Nett, Mand, Sekere, Wenik</i>	212
Republic of the Marshall Islands <i>Majuro, Ebeye (Kwajalein atoll), Ailinglaplap</i>	218

Palau <i>Koror, Ngaraard, Melekeok, Airai</i>	214
Yap <i>Rull, Tomil, Weloy, Ulithi</i>	205
Kosrae <i>Tafunsak, Lelu, Sansrik, Malem, Utwe/Walung</i>	207
Chuuk <i>Weno (Sapuk, Iras), Tol, Tonoas, Uman</i>	231
FAS Prevalence Data (total)	1,287
CHL Total (CHL Intervention + FAS Prevalence)	5,775

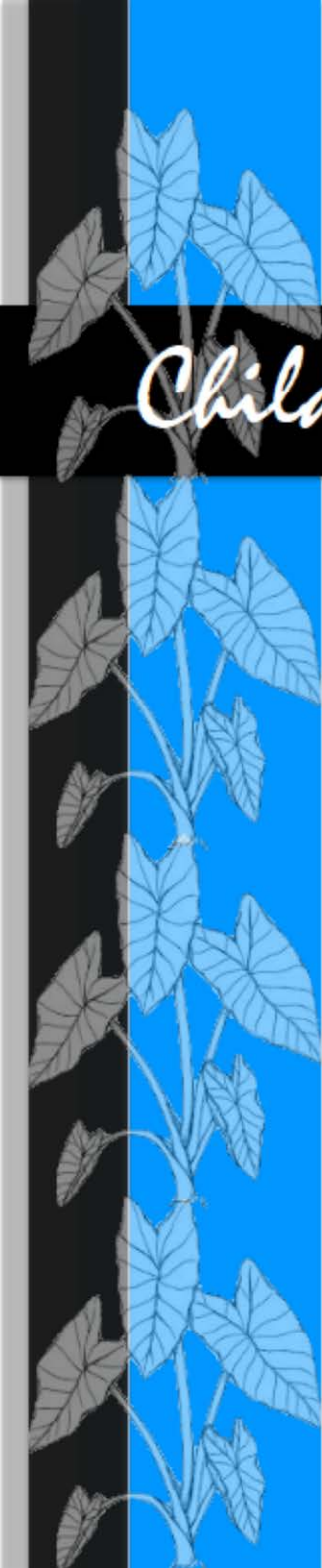
Community Report



Children's Healthy Living Program

V. Aoloau Community Report

The total number of responses for each question may not match the total number of consented participants. Parents identified their children as eligible (including age eligible) and consented, upon which children participated in the study. In data analysis, upon calculation of age by study metrics, some children were outside the defined age range and were excluded from the analysis. In addition, not all who consented to participate in the study completed all parts or all items of all the questionnaires, so the results for each item reflect only those who answered that question or whose data were available at the time of this report. Potential outliers with extreme values (defined as those with a value of 3 standard deviations (sd) above or below the mean) were also excluded from this report. The total percentage may not add up to 100 because of rounding.



Child Demographics



Section 1. Child Demographics

A total of 143 children participated from Aoloau. Parents / caregivers answered multiple questions about their child participating in the CHL research program. The following section reports some of that information collected, including child’s sex, age, race and ethnicity.

Sex: All 143 children participated had data on sex.

Table S.1.1. Number and Percent of Participants by Sex

Sex	Number	Percent
Boys	81	56.6%
Girls	62	43.4%
Total	143	100%

Age: Child’s age was calculated between age in years elapsed between child’s date of birth and the date when anthropometry was measured. The distribution of age of the children is shown below.

Table S.1.2. Number and Percent of Participants by Age

Age in Years	Number	Percent
Age 2	20	14.0%
Age 3	23	16.1%
Age 4	22	15.4%
Age 5	18	12.6%
Age 6	23	16.1%
Age 7	17	11.9%
Age 8	20	14.0%
Total	143	100%

Table S.1.3. Number and Percent of Participants by Age Group

Age in Years	Number	Percent
2-5 years old	83	58.0%
6-8 years old	60	42.0%
Total	143	100%

Racial and Ethnic Heritage

The data collection questions used in this section and for the household demographics came from various sources. Some items were generated by CHL staff; some came from The Center for Alaska Native Health Research Demographic and Medical Screening Questionnaire, the Behavioral Risk Factor Surveillance System 2011 survey, and the 2011 Middle School Youth Risk Behavior Survey.

Table S.1.4. The Distribution of Race of the Children Using the U.S. Office of Management and Budget (OMB) Definition

Race of child of OMB definition	Number	Percent
Native Hawaiian or other Pacific Islander	134	93.7%
More than one race	9	6.3%
Total	143	100%

Table S.1.5. The Distribution of Race/Ethnicity of the Children Using the CHL Pacific Definition Which Prioritize the Indigenous Ethnic Groups in the Jurisdiction (CHL Pacific)

Race of child of Pacific definition	Number	Percent
Samoan	123	86.0%
Native Hawaiian mixed with Samoan	11	7.7%
Mixed Samoan	6	4.2%
Native Hawaiian mixed with other race group	3	2.1%
Total	143	100%

Child's Birth Place

Parents or caregivers responded to the question: "In what city or country was your child born?"

Table S.1.6. Child's Place of Birth

Birth Place	Number	Percent
American Samoa	123	86.0%
Hawaii	7	4.9%
West Samoa	7	4.9%
Other (Including USA, California, and Washington)	6	4.2%
Total	143	100%

Parents responded to the question about residence: "How many years has your child lived here?"

Among the 143 children, 138 had information on this question. Among them, 122 (88.4%) lived their whole life in Aoloau and the rest 11.6%, spent 42 to 87 percent of their life here.

Language Child Speaks

The language distribution of the children in the survey is listed in the following table.

Note: Language responses may total over 143 and 100% because some respondents could speak more than one language.

Table S.1.7. Top Languages Child Speaks

Top languages child speaks	Number	Percent
Samoan	80	55.9%
English and Samoan	63	44.1%
Total	143	100%

Samoan was the top language spoken at home (86.0%). Other languages children in Aoloau spoke at home included English and Samoan. Fifty percent of children spoke one language other than English at home. **Fifty percent of the children spoke English and at least one other language.**

Summary

Among the 143 children, 62 (43.4%) were girls and 81 (56.6%) were boys. Furthermore, 83 (58.0%) were of age group 2-5 years and 60 (42.0%) were of age group 6-8 years. Among the 143 children, all had information on race, of which 123 (86.0%) were Samoan.



Child Anthropometric Measurement Results



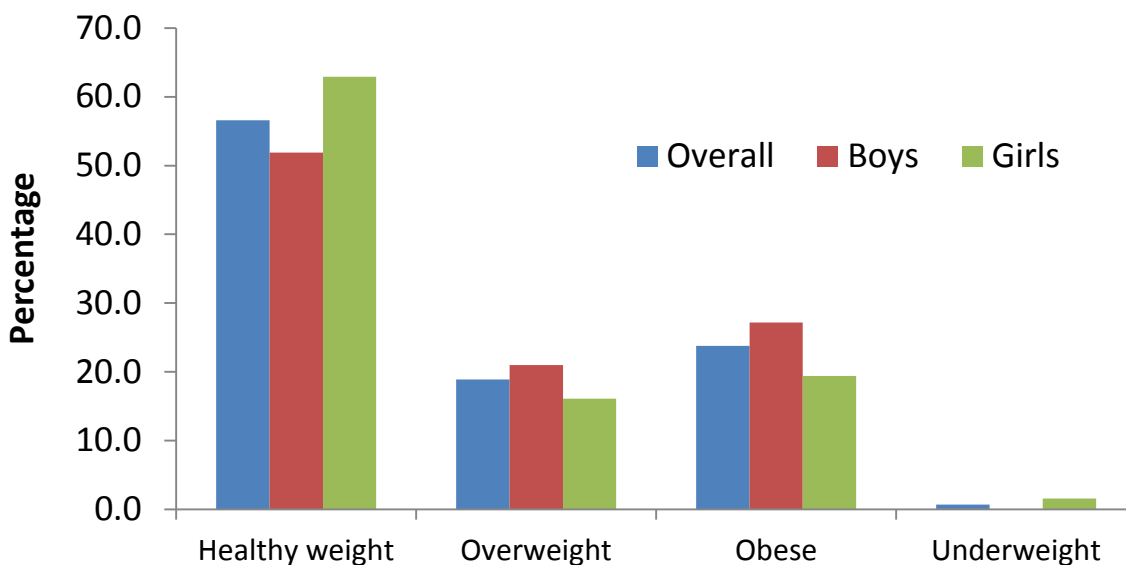
Section 2. Child Anthropometric Measurement Results

Body Mass Index

Among the 143 children who participated in Aoloau, all had valid measurements of Body Mass Index (BMI).

Overweight was defined as the 85th - 94th percentile for BMI (weight, kg/height, m²) and obesity was defined as greater than or equal to the 95th percentile for BMI (Centers for Disease Control and Prevention, 2009).

Prevalence of Overweight and Obesity of Study Children in Aoloau



A total of 143 children were included for this analysis. Among them, 56.6% were healthy weight, 18.9% were overweight, 23.8% were obese, and 0.7% were underweight. No difference was found between boys and girls, or between children ages 2-5 and those 6-8 years old.

Abdominal Obesity

The International Diabetes Federation (IDF) suggests that children 6 years or older with a waist circumference equal or greater than the 90th percentile be considered as having abdominal obesity (Zimmet, et al., 2007). For children younger than 6 years of age, currently there is insufficient information for such classification. Using children ages 6-8 years in the CHL data set as the reference data, the 90th percentile cutoff value is 71.47cm. The 90th percentile cutoff value reported from the IDF, which uses “a nationally representative sample” of boys and girls, is 67.65 cm for 7-year olds.

Among the 60 participants in **Aoloau** between the ages 6-8 years, using either the CHL cutoff or IDF cutoff value, **11 (18.3%) or 15 (25.0%) of children 6-8 year olds were considered as having abdominal obesity.**

Acanthosis Nigricans (AN)

Acanthosis nigricans is an indicator of high insulin levels, which can lead to insulin resistance and Type 2 diabetes. Acanthosis nigricans presents as a light brown, black velvety, rough, or a thickened lesion on the surface of the skin. These features are usually seen in body folds and creases, on the nape of the neck, armpits, and over the knuckles. This screening suggests a problem with handling the body’s insulin, and the possibility of having pre-diabetes or diabetes. CHL staff encouraged the parents/caregivers of these children to make an appointment for these children to see a doctor for further information and care.

Burke’s (1999) quantitative scale was utilized, with scores given for the severity of AN. Among the 143 children who participated, all had data on AN, of which 4 (2.8%) screened positive for AN.



Child Nutrition And Diet Reports



Section 3. Child Nutrition and Diet Reports

Parents and caregivers completed logs of everything their children ate and drank for two assigned days. The design of the logs was based on previous research conducted by the principal investigator as well as other team members.

For Aoloau, 117 Food and Activity Logs were reviewed by CHL staff and are included in this report.



The top five foods, beverages or condiments reported that children ate are shown in the table below.

Table S.3.1. Top 5 Foods, Beverages, or Condiments Most Commonly Reported

Food description	Aoloau	
	Number of times reported	% of all foods reported
1. White rice, not enriched	271	6.7%
2. Milk, 2%	179	4.4%
3. White bread, enriched	138	3.4%
4. Canned sweetened tea	103	2.6%
5. Milk, 1%	91	2.3%

Fruit and Vegetable Intake

The United States Department of Agriculture (USDA) daily recommended amounts of fruits and vegetables for children 2-8 years of age are shown in the table below.

United States Department of Agriculture's My Daily Food Plan		
Daily recommended amount of fruits and vegetables	 VEGETABLES	 FRUITS
2 years	1 cup	1 cup
3 years	1 ½ cup	1 cup – 1 ½ cup
4-5 years	1 ½ cup – 2 cups	1 cup – 1 ½ cup
6-8 years	1 ½ cup – 2 ½ cups	1 cup – 2 cups

Children should consume at least 1 cup of fruit and 1 cup of vegetables daily, with these recommendations (as shown in the table) increasing as children age. This aligns with the CHL behavioral intervention target or goal: to eat more fruits and vegetables daily.

In Aoloau, children ate 2.9 servings of fruits and vegetables per day on average as recorded by parents/caregivers on the two-day food log. The average servings of fruit was 1.8 per day and the average servings of vegetables was 1.2 per day.

74 (63.3%) of children in Aoloau met the U.S. national recommendations for daily fruit consumption.

34 (29.1%) of children in Aoloau met the U.S. national recommendations for daily vegetable consumption.

Water

Children should consume at least 32 - 40 fluid ounces (4 - 5 cups) of water from all beverages (milk, juice, drinking water) daily. CHL behavioral intervention target or goals were to encourage children to drink more water.

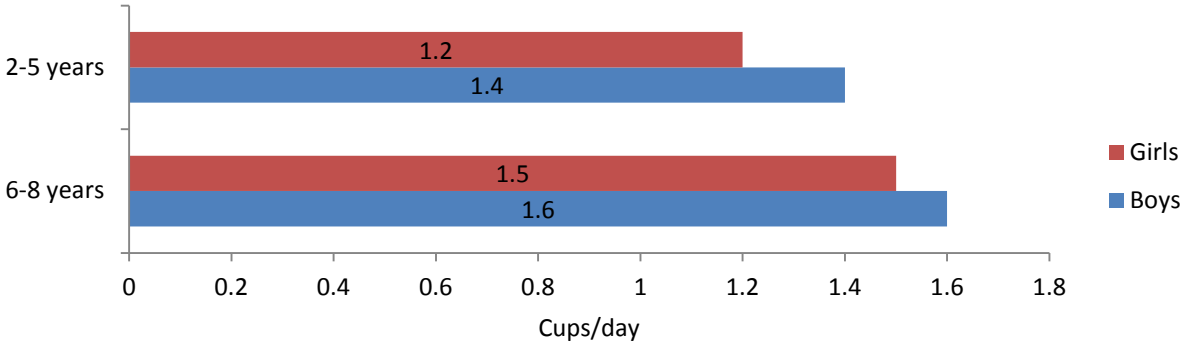
82.1% of Parents/caregivers reported on the two-day Food and Activity Log that their child drank water daily.

On average, children in Aoloau drank 1.5 cups of water daily.

Table S.3.3. Intake of Daily Drinking Water by Age Group and Sex

Drinking water intake (cups / day) by sex	Aoloau	
	Number	Mean (SD)
Boys		
2 – 5 years	29	1.4
6 – 8 years	31	1.6
All	60	1.5
Girls		
2 – 5 years	18	1.2
6 – 8 years	39	1.5
All	57	1.4

Recorded intake of Daily Drinking Water (cups / day) by Sex and Age for all Children



Sugar-Sweetened Beverages (SSB)

CHL behavioral intervention targets or goals are to limit (or avoid) the consumption of sugar-sweetened beverages (SSB).

From the two-day food record, 98 (83.8%) of parents/caregivers in Aoloau reported that their child consumed SSBs.

Children drank 1.2 cups of sugar-sweetened beverages on average daily.

For Aoloau, the most frequently consumed SSB included canned sweetened tea, canned orange-apricot, and Kool-Aid.

Children’s intake of Sugar-Sweetened Beverages (cups/day) for Aoloau

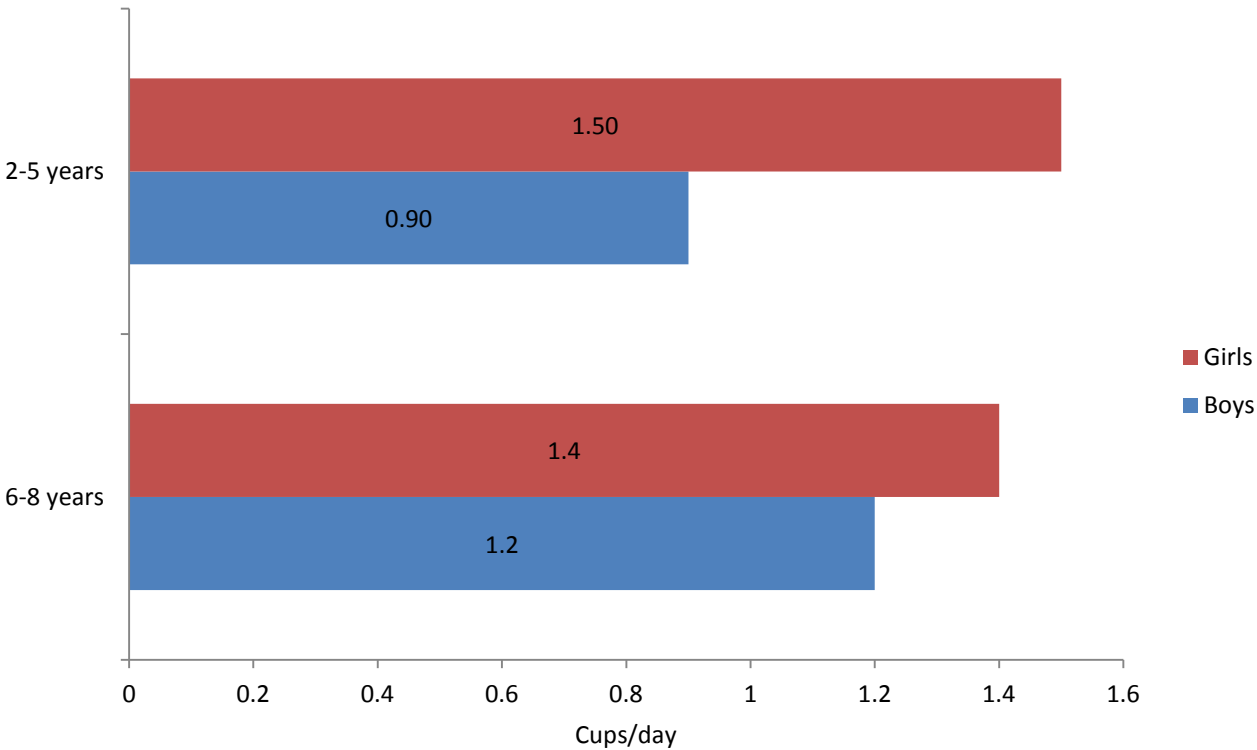


Table S.3.4. Mean SSB Intake (cups/day) for all Children and Those with SSB's Recorded for Aoloau

Mean SSB intake (cups/day)	All children		SSB Recorded	
	Number	Mean (SD)	Number	Mean (SD)
Boys				
2 – 5 years	29	0.9	22	1.1
6 – 8 years	31	1.2	24	1.6
All	60	1.1	46	1.4
Girls				
2 – 5 years	18	1.5	15	1.8
6 – 8 years	39	1.4	37	1.4
All	57	1.4	52	1.5

Table S.3.5. Proportion of SSB Consumption Greater than 2 cups per day Among all Children and Only Children with SSB Recorded for Aoloau

Proportion of children with SSB consumption greater than 2 cups per day	All children, number (%)		SSB Recorded, number (%)	
	0-2 cups	greater than 2 cups	0-2 cups	greater than 2 cups
Boys				
2 – 5 years	25 (86.2%)	4 (13.8%)	18 (81.8%)	4 (18.2%)
6 – 8 years	26 (83.9%)	5 (16.1%)	19 (79.2%)	5 (20.8%)
All	51 (85.0%)	9 (15.0%)	37 (80.4%)	9 (19.6%)
Girls				
2 – 5 years	13 (72.2%)	5 (27.8%)	10 (66.7%)	5 (33.3%)
6 – 8 years	30 (76.9%)	9 (23.1%)	28 (75.7%)	9 (24.3%)
All	43 (75.4%)	14 (24.6%)	38 (73.1%)	14 (26.9%)



Physical Activity From Accelerometers



Section 4. Physical Activity from Accelerometers

To provide data on their physical activity levels, about 100 children in each community were fitted with Actical accelerometers on the first day of measurement. Accelerometers are objective tools for measuring physical activity. Children were instructed to wear the accelerometers for 6 days without removal. Accelerometers were set to record children's movements at each second. Recorded movements are known as counts. The accelerometer counts were summed to derive the number of counts per minute (cpm). These cpm were then used to derive activity levels based on the following criteria:

- Sedentary, if $\text{cpm} \leq 40$
- Light, if $41 \leq \text{cpm} \leq 2295$
- Moderate, if $2296 \leq \text{cpm} \leq 6815$
- Vigorous, if $\text{cpm} \geq 6816$

Sedentary (physical inactivity) behaviors includes excessive sitting, lying, as well as screen time. In this study, time spent on sleeping was not excluded from the sedentary results and was also considered as sedentary. **Light** activities include things such as walking at a slow pace or cleaning. **Moderate** types of activities include brisk walking, dancing and some active play, while **vigorous** activities include running, fast cycling and fast swimming.

Potential outliers with extreme values (defined as those with a value of 3 standard deviations (sd) above or below the mean) were excluded from this report. In **Aoloau**, Actical accelerometers from 42 children provided valid data on their physical activity levels. After excluding outliers, on average children spent 11.1 hours in sedentary activities (sd=1.2 hours).

On average, children in Aoloau spent 11 hours and 34 minutes (sd=1.3 hours) on light activities. On average, children in Aoloau engaged 1 hour and 16 minutes on moderate

activities (sd=0.5). On average, children in Aoloau spent 9 minutes (sd=0.3) on vigorous activities. On average, children spent 1 hour and 30 minutes (sd=0.8) on moderate or vigorous activities.

Of the 42 children with accelerometer data, 32 (76.2%) of children in Aoloau met the U.S. national recommendations for achieving at least 60 minutes of moderate or vigorous activity daily, which is also a CHL behavioral intervention target or goal.

This information can be found in the following table.

Table S.4.1. Hours of Physical Activity by Type

Physical activity from accelerometer	Mean hours/day (sd)	
Sedentary activities (weighted) per day	11.1 (1.2)	
Light activities (weighted) per day	11.6 (1.3)	
Moderate activities (weighted) per day	1.3 (0.5)	
Vigorous activities (weighted) per day	0.2 (0.3)	
Moderate and vigorous activities (weighted) per day	1.5 (0.8)	
	Number	%
Met national recommendation of ≥ 60 minutes of moderate or vigorous physical activity daily	32	76.2%



Screen Time



Section 5. Screen Time

The following set of questions was adapted from Buckworth, J., & Nigg, C. (2004); Nigg, C. R. (2005); Haas, S., & Nigg, C. R. (2009).

Parents were asked, “On usual weekdays (Monday to Friday), how many hours a day does your child spend watching Television and/or videos/ DVD?” They were asked the same question about the weekend days.

Among the 143 children participated in Aoloau, 4 children had data on the overall time spent on watching TV. The overall average among those 4 children is 1.4 hours/day (sd=0.6) overall, 1.1 hours (sd=0.9) on weekdays, and 2.0 hours (sd=1.7) on weekends. The following table summarizes the distribution of duration of TV watching.

Table S.5.1. Hours per day of TV Watching

Hours per day child watches TV (n=157)	Percent of children		
	Per Day (adjusted for weekday and weekend)	Per Weekday	Per Weekend day
1/2 hour or less	--	25.0%	25.0%
More than 1/2 hour up to 2 hours	75.0%	75.0%	25.0%
More than 2 hours up to 4 hours	25.0%	--	50.0%
More than 4 hours up to 6 hours	--	--	--
More than 6 hours up to 7 hours	--	--	--
Total	100%	100%	100%

INACTIVE Video Games (Per day, Per Weekday, and Per Weekend day)

Parents were asked, “On a usual weekdays (Monday to Friday), how long on average a day does your child spend playing INACTIVE video games (DS, Play station, XBOX, Wii computer games, etc.)?” They were asked the same question about the weekend days.

Among the 142 children participated in Aoloau, a total of 4 had data on the overall time spent on inactive video games. The **overall average among those 4 children is 1.7 hours/day** (sd=0.4). A total of 4 children had data on weekday and weekend inactive video time. Average inactive video time on weekdays is 1.6 hours/day (sd=0.9) and on weekends is 1.9 hours/day (sd=1.7). The following table summarizes the distribution of duration of inactive video playing time.

Table S.5.2. Hours per day of Inactive Video Games

Hours per day child spent on inactive video games	Percent of children		
	Per Day (adjusted for weekday and weekend)	Per Weekday	Per Weekend day
1/2 hour or less	--	25.0%	25.0%
More than 1/2 hour up to 2 hours	75.0%	50.0%	50.0%
More than 2 hours up to 4 hours	25.0%	25.0%	25.0%
More than 4 hours up to 6 hours	--	--	--
More than 6 hours up to 7 hours	--	--	--
Total	100%	100%	100%

ACTIVE Video Games (Per day, Per Weekday, and Per Weekend day)

Parents were asked, “On a usual weekdays (Monday to Friday), how long on average a day does your child spend playing ACTIVE video games (DS, Play station, XBOX, Wii computer games, etc.)?” They were asked the same question about the weekend days.

Among the 142 children participated in Aoloau, a total of 4 had data on the overall time spent on active video games. The **overall average among those 4 children is 1.7 hours/day** (sd=0.7). A total of 4 children had data on weekday active video time. Average active video time on weekdays is 1.4 (sd=1.1). A total of 4 children had data on weekend active video time. Average active video time on weekend is 2.4 (sd=1.1) . The following table summarizes the distribution of duration of active video playing time.

Table S.5.3. Hours per day of Active Video Games

Hours per day child spent on active video games	Percent of children		
	Per Day (adjusted for weekday and weekend)	Per Weekday	Per Weekend day
1/2 hour or less	--	25.0%	--
More than 1/2 hour up to 2 hours	75.0%	50.0%	75.0%
More than 2 hours up to 4 hours	25.0%	25.0%	25.0%
More than 4 hours up to 6 hours	--	--	--
More than 6 hours up to 7 hours	--	--	--
Total	100%	100%	100%

Screen Time - Overall

This variable was created by adding the hours for watching TV and DVDs, the hours playing active video games, and the hours playing inactive video games. The overall mean is a weighted average of weekday and weekend hours.

Among the 143 children participated in Aoloau, 4 had data on the overall screen time, which averaged 4.7 hours/day (sd=1.2). A total of 4 had data on weekday screen time, which averaged 4.1 hours/day (sd=2.6). A total of 4 had data on weekend screen time, which averaged 6.3 hours/day (sd=4.3). The following table summarizes the distribution of duration of screen time.

Table S.5.4. Hours per day of Screen Time

Hours per day child spent on screen time	Percent of children		
	Per Day (adjusted for weekday and weekend)	Per Weekday	Per Weekend day
1/2 hour or less	--	25.0%	--

More than ½ hour up to 2 hours	--	--	25.0%
More than 2 hours up to 4 hours	25.0%	25.0%	--
More than 4 hours up to 6 hours	50.0%	25.0%	25.0%
More than 6 hours up to 7 hours	25.0%	25.0%	50.0%
Total	100%	100%	100%



Section 6. Sleep

The National Sleep Foundation **recommends** for 2 year olds: 11-14 hours of sleep/night; for 3 to 5 year olds: 10-13 hours/night; and for 6 to 8 year olds: 9-11 hours/night. The National Sleep Foundation also gives a **range** that may be appropriate for an individual child which is a bit wider with 9-16 hours for 2 year olds; 8-14 hours for 3 to 5 year olds; and 7-12 hours for 6 to 8 year olds.

Parents were asked, “How many hours of sleep on average does your child get in a 24-hour period (at night and in naps)?” The respondents were asked to choose from 0 hours to over 13 hours in half hour increments. For those who chose over 13 hours, 13.5 hours was assigned instead; hence, the maximum hours are at 13.5 hours.

Some participants misunderstood the question but put down child’s nap time or hours sleep on the previous night instead of average sleep duration. Therefore, observations where sleep duration was less than 3.5 hours were removed from this report as those values are more or less considered as biologically implausible values.

Table S.6.1. Number and Percent of Children’s Average Hours of Sleep per day by Age

Hours of sleep in 24 hours at night and in naps (on average and from parent / caregiver report)	Number	%
2 year olds	15	100%
Less than 9 hours	5	33.3%
9 hours to less than 11 hours	3	20.0%
11 hours or more (to 13.5 hours)	7	46.7%
3 – 5 year olds	47	100%
Less than 8 hours	2	4.3%
From 8 hours to less than 10 hours	16	34.0%
From 10 hours to 13.5 hours	29	61.7%

Hours of sleep in 24 hours at night and in naps (on average and from parent / caregiver report)	Number	%
6 – 8 year olds	44	100%
Less than 7 hours	1	2.3%
From 7 hours to less than 9 hours	18	40.9%
From 9 hours to 13.5	25	56.8%

Table S.6.2. Number and Percent of Children Meeting Recommended Hours of Sleep

Met recommended hours of sleep	Number	%
Two year olds met recommendation of 11 – 14 hours of sleep	7	46.7%
Three to five year olds met recommendation of 10 – 13 hours of sleep	29	61.7%
Six to eight year olds met recommendation of 9 – 11 hours of sleep	25	56.8%

The following questions were modified from The Tayside children’s sleep questionnaire (McGreavey, Donnan, Pagliari, & Sullivan, 2005).

Table S.6.3. Number and Percent of Minutes to Fall Asleep

How long after going to bed does your child usually fall asleep?	Number	%
0 to less than 15 minutes	--	--
15 to less than 30 minutes	3	75.0%
30 to less than 45 minutes	--	--
45 to less than 60 minutes	--	--
60 minutes and more	1	25.0%
Total	4	100%

Table S.6.4. Number and Percent of Children with Difficulty Getting to Sleep

The child has difficulty getting to sleep at night (and may require a parent to be present)	Number	%
This sleep behavior never occurs	3	75.0%
The behavior occurs once or twice a month	--	--
Occurs one to two times a week	--	--
Occurs between three and five nights a week	--	--
The sleep behavior happens every night	1	25.0%
Total	4	100%

Table S.6.5. Number and Percent of Children Not Falling Asleep in Own Bed

Child does not fall asleep in his or her own bed.	Number	%
This sleep behavior never occurs	2	50.0%
The behavior occurs once or twice a month	1	25.0%
Occurs one to two times a week	--	--
Occurs between three and five nights a week	--	--
The sleep behavior happens every night	1	25.0%
Total	4	100%

Table S.6.6. Number and Percent of Children Waking Up at Night

Child wakes up during the night	Number	%
This sleep behavior never occurs	2	50.0%

The behavior occurs once or twice a month	1	25.0%
Occurs one to two times a week	1	25.0%
Occurs between three and five nights a week	--	--
The sleep behavior happens every night	--	--
Total	4	100%

Table S.6.7. Number and Percent of Children Difficulty Falling Asleep After Wakening

After waking up in the night, child has difficulty falling asleep again by himself or herself.	Number	%
This sleep behavior never occurs	3	75.0%
The behavior occurs once or twice a month	1	25.0%
Occurs one to two times a week	--	--
Occurs between three and five nights a week	--	--
The sleep behavior happens every night	--	--
Total	4	100%

Table S.6.8. Number and Percent of Children Sleeps Some of the Night in Parent's Bed

Child sleeps in the parent's bed at some time during the night	Number	%
This sleep behavior never occurs	2	50.0%
The behavior occurs once or twice a month	--	--
Occurs one to two times a week	1	25.0%
Occurs between three and five nights a week	--	--

The sleep behavior happens every night	1	25.0%
Total	4	100%

Table S.6.9. Number and Percent of Children Needing Parent to Replace a Comforter After Waking in Night

If child wakes, he or she uses a comforter (e.g. pacifier or binky) and requires a parent to replace it.	Number	%
This sleep behavior never occurs	2	50.0%
The behavior occurs once or twice a month	--	--
Occurs one to two times a week	1	25.0%
Occurs between three and five nights a week	--	--
The sleep behavior happens every night	1	25.0%
Total	4	100%

Table S.6.10. Number and Percent of Children Wanting a Drink During the Night

Child wants a drink during night (including breast or bottle-feed)	Number	%
This sleep behavior never occurs	3	75.0%
The behavior occurs once or twice a month	1	25.0%
Occurs one to two times a week	--	--
Occurs between three and five nights a week	--	--
The sleep behavior happens every night	--	--
Total	4	100%

Table S.6.11. Number and Percent of Children with Sleeping Difficulties

Do you think your child has sleeping difficulties?	Number	%
--	--------	---

No	3	100%
Yes	0	0%
Total	3	100%

Summary

Among the 62 two to five year olds, 47% met the national recommendation of sleep of between 11-13 hours daily. Another 35% of children slept more than 8 hours but less than 11 hours daily and 8% slept less than 8 hours. About 70 (66%) of our younger children (2-5 years old) did not meet the national recommendation of 11-13 hours daily of sleep. This is an opportunity for both parents and educators to intervene to help children get more sleep.



Section 7. Medical

Parents answered the question: Does your child have any current medical conditions diagnosed by a doctor? Among the 143 children, 16 (11.2%) reported that their children had a medical conditions diagnosed by a doctor. The top medical condition was asthma (12, 8.4%).



*Early Life & Feeding
Of A Child*



Section 8. Early Life and Feeding of Child

Birth Weight

Among the 143 children participated from Aoloau, a total of 111 had information on birth weight. The distribution of birth weight into three groups is summarized in the following table.

Table S.8.1. Number and Percent of Children by Birth Weight

Birth Size	Number	%
Low birth weight < 2500 g	2	1.8%
Healthy birth weight (2500 – 4000 g)	88	79.3%
High birth weight > 4000 g	21	18.9%

Among the 143 children participated in Aoloau, a total of 20 had information on birth length. Among the 20 children, 11 (55%) had birth length below 5 percentile using the CDC 2000 reference data, which is at 45.57 cm.

Early Feeding Pattern

Among the 143 children participated in Aoloau, a total of 138 had information on breastfeeding. Among the 138 children, 106 (76.8%) of children were reported to be ever breastfed.

Table S.8.2. Number and Percent of Children Ever Breastfed or Fed Breast Milk

Child ever Breastfed or fed Breastmilk	Number	%
Yes	106	76.8%
No	32	23.2%
Total	138	100%
If Yes, (about children who were ever breastfed)		

Mean age child stopped breastfeeding or being fed breast milk (months) (n=88)	12.2 months
--	-------------

Among the 143 children participated in Aoloau, a total of 133 had information on formula feeding. Among those 133 children, 91 (68.4%) of children were reported to be ever formula fed. Mean age of children started formula feeding or stopped formula feeding is reported in the following table.

Table S.8.3. Number and Percent of Children Ever Fed Formula

Child ever fed formula	Number	%
Yes	91	68.4%
No	42	31.6%
Total	133	100%
If Yes, (about children who were fed formula)		
Mean age (sd) child first fed formula (months) (n=72)	6.1 months	
Mean age (sd) child completely stopped drinking formula (months) (n=57)	15.4 months	

A total of 111 out of the 143 children had information on age when the child was fed anything other than breast milk or formula (juice, cow's milk, sugar water, baby food, or anything else, even water). The mean age of this is 7.7 months.



Household Demographics & Measures



Section 9. Household Demographics and Measures

Parents and other caregivers brought their children to participate in the CHL measurement study. The following section summarizes the participant's relationship to the child, the parent or caregiver's marital status, educational achievement, employment status, family income, and family structure.

Relationship

Relationship of the caregiver participant to the child is summarized in the following table.

Table S.9.1. Number and Percent of Caregiver's Relationship to Child

Relationship	Number	Percent
Biological mom	108	75.5%
Birth dad	19	13.3%
Legal guardian, caregiver, other	9	6.3%
Grandmother	4	2.8%
Other*	3	2.1%

**Includes adoptive dad, adoptive mom, and grandparents*

Marital Status

A total of 141 out of the 143 participants had marital status information of the respondent (see the following table).

Table S.9.2. Frequency and Percent of Caregiver's Marital Status

Marital Status	Number	Percent
Married	114	80.9%
Single and living with boyfriend, girlfriend, or partner	8	5.7%
Single and not living with boyfriend, girlfriend, or partner	7	5.0%
Other (not specified)	5	3.6%
Separated	4	2.8%
Other*	3	2.1%

**Includes divorced and widowed*

Household Size and Multi-generation Households



All 143 children had information on the number of people lived in the same household and their relationship to the child. Among them, 62 (43.4%) are from multi-generation households.

Mean size of household is 6, with the minimum of 2 and maximum of 17.

Education

The education levels of the caregivers – (the parents or guardians) are shown below

Table S.9.3. Number and Percent of Caregiver’s Education Level

Education	Number	Percent
Never attended school or only kindergarten	3	2.1%
Grades 1 up to 8 (elementary to middle)	3	2.1%
Grades 9 to 11 (some high school)	9	6.3%
Grades 12 or GED (high school graduate)	86	60.1%
College or technical school 1 to 3 years	20	14.0%
College 4 years or more	22	15.4%
Total	143	100%

Employment Status of the Caregiver Participants

Among the 143 children participated in Aoloau, all had information on whether the respondent is employed for wages/salary, whether he/she is self-employed, whether he/she is out of work for more than a year or less than a year, whether the respondent is a homemaker, a student, unable to work or has more than one job.

Table S.9.4. Number and Percent of Caregiver’s Employment Status

Employment	Number	Percent
Employed for wages / salary	58	40.6%
Self-employed	1	0.7%
Subsistence	5	3.5%
Out of work (less than 1 year)	13	9.1%
Out of work (more than 1 year)	58	40.6%

Homemaker	6	4.2%
Student	4	2.8%
Retired	8	5.6%
Unable to work	18	12.6%
More than one job	53	26.9%

*Note: responses may total over 100% because respondents could select more than one category.

Household Income Level

Among the 143 children participated in Aoloau, 127 had information on annual Household income from all sources over the past 12 months. The following table summarizes this information.

Table S.9.5. Number and Percent of Caregiver's Household Income Level

Annual household income in the past 12 months	Number	Percent
Under \$10,000	71	55.9%
From \$10,000 to less than \$20,000	34	26.8%
From \$20,000 to less than \$35,000	12	9.5%
From \$35,000 to less than \$75,000	6	4.7%
Above \$75,000	4	3.2%
Total	127	100%

Religion

Among the 143 children, a total of 142 had information on family's religious affiliation. Out of the 142, 0 (0%) reported no religious affiliation. Among the 142 with any type of religious affiliation, the distribution of different religious affiliations is presented in the following table. A total of 12 had information on how often they engage in religious activities. The mean number of times per month attending religious activities is 10.0 among those participants.

Table S.9.6. Number and Percent of Respondents' Religious Affiliation

Religion Affiliation	Frequency	Percent
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Protestant	67	47.2%
Catholic	33	23.2%
Pentecostal	22	15.5%
Mormon/Latter-day Saints	16	11.3%
Other*	4	2.8%
Total	142	100%

*Includes Baptist and Episcopalian

Food Security / Resource Availability

Food security and availability was included in the demographic questionnaire, to help understand the support services used by participants in our geographically varied jurisdictions. The food security questions were adapted from questions used by USDA to Assess Household Food Security (USDA, 2008). NHANES (cdc.gov/nchs/data/nhanes/nhanes_11_12/fsq_family.pdf).

Participants were asked, in the past 12 months, how often money for food or money for utility runs out before the end of the month. Among the 143 children participated in Aoloau, a total of 120 had information on whether money for food runs out or not and a total of 128 had information on whether money for utility runs out or not. The following table presents the answers.

Table S.9.7. Number and Percent of Caregiver's Money for Food and Utilities

Food Insecurity and Utilities in past 12 months	Number	%
Money runs out for food before the end of the month.		
Never	20	16.7%
Seldom	30	25.0%
Sometimes	53	44.2%
Most times	16	13.3%
Always	1	0.8%
Money for household utilities (water, fuel, etc.) runs out before the end of the month.		

Never	22	17.2%
Seldom	31	24.2%
Sometimes	50	39.1%
Most times or always	25	19.5%
Always	--	--

A total of 141 children had information on whether they received assistance to pay food. Among those 141 children, 120 (85.1%) reported they did receive assistance. The following table summarizes different types of benefits their households have received.

Table S.9.8. Number and Percent of Caregiver’s Who Receive Food Assistance

Food Assistance Benefits received for those who obtained food assistance	Number	%
EBT/ SNAP / NAP (formerly called Food Stamps)	23	20.2%
Food Assistance (Food Bank / Food Pantries or Commodity foods)	4	3.5%
WIC benefits	100	87.7%
Free or reduced cost breakfast or lunch at school	17	14.9%

*Note: responses may total over 100% because respondents could select more than one category.

Culture

The degree of participants’ own group’s cultural and U.S. mainland cultural identifications were assessed using an acculturation questionnaire originally designed for use with Native Hawaiians (Kaholokula, Grandinetti, Nacapoy and Chang, 2008). The following tables summarize responses to those questions.

Table S.9.9. Number and Percent of Caregiver's Knowledge of Traditional Culture and Lifestyle

Knowledge of traditional culture & lifestyle	Number	Percent
Very knowledgeable	63	44.7%
Somewhat knowledgeable	74	52.5%
Neutral or no response	4	2.8%
Somewhat not knowledgeable	--	--
Not at all knowledgeable	--	--

Table S.9.10. Number and Percent of Caregiver' Involvement with Traditional Culture and Lifestyle

Involved with traditional culture & lifestyle	Number	Percent
Very involved	41	29.5%
Somewhat involved	75	54.0%
Neutral or no response	18	13.0%
Somewhat not involved	5	3.6%
Not at all involved	--	--

Table S.9.11. Number and Percent of Caregiver's Feelings Towards Traditional Culture and Lifestyle

Feel towards traditional culture & lifestyle	Number	Percent
Very positive	67	47.5%
Somewhat positive	57	40.4%
Neutral or no response	10	7.1%
Somewhat negative	3	2.1%
Very negative	4	2.8%

Table S.9.12. Number and Percent of Caregiver's Association with Traditional Culture and Lifestyle

How often associate with people of your traditional culture & lifestyle	Number	Percent
Most of the time	41	29.5%
Somewhat often	75	54.0%
Neutral or no response	11	7.9%
Very little of the time	7	5.0%
Not at all	5	3.6%

Table S.9.13. Number and Percent of Respondents' Knowledge of U.S. Mainland/Lower 48 Culture and Lifestyle

Knowledge of U.S. Mainland / Lower 48 culture and lifestyle	Number	Percent
Very knowledgeable	25	17.6%
Somewhat knowledgeable	83	58.5%
Neutral or no response	15	10.6%
Somewhat not knowledgeable	7	4.9%
Not at all knowledgeable	12	8.5%

Table S.9.14. Number and Percent of Caregiver's Involvement in U.S. Mainland/Lower 48 Culture and Lifestyle

Involvement with U.S. Mainland / Lower 48 culture and lifestyle	Number	Percent
Very involved	14	10.0%
Somewhat involved	61	43.6%
Neutral or no response	35	25.0%
Somewhat not involved	10	7.1%
Not at all involved	20	14.3%

Table S.9.15. Number and Percent of Caregiver's Feelings Toward U.S. Mainland/Lower 48 Culture and Lifestyle

Feeling towards U.S. Mainland / Lower 48 culture and lifestyle	Number	Percent
Very positive	17	12.1%
Somewhat positive	66	46.8%
Neutral or no response	21	14.9%
Somewhat negative	23	16.3%
Very negative	14	9.9%

Table S.9.16. Number and Percent of Caregiver's Association with U.S. Mainland/Lower 48 Culture and Lifestyle

How often associate with U.S. Mainland / Lower 48 culture and lifestyle	Number	Percent
Most of the time	20	14.1%
Somewhat often	59	41.6%
Neutral or no response	25	17.6%
Very little of the time	16	11.3%
Not at all	22	15.5%

Community Assessment Results



VI. Community Assessment Results

The Community Assessment Toolkit or CAT is a collection of data-recording forms to evaluate the food and physical activity environments of communities. These enabled us to study determinants of healthy eating, physical activity, and obesity among youth.

Section 1. Food Resources and Physical Activity Environment

The assessment of the food environment included inventories and surveys of fast food restaurants, and food outlets, with documents adapted from other surveys (Bridging the Gap (BTG) and Community of Excellence (CX3))

- **CX3 Scores for Food outlet**
 - a. Accepts WIC and Food stamps / SNAP/ EBT
 - b. Availability of fresh fruit and quality of fruit
 - c. Availability of fresh vegetable and quality of vegetable
 - d. Other healthful foods
 - e. Unhealthy products
 - f. Nutrition information
 - g. Number of healthy and unhealthy ads present inside and outside the food outlet
 - h. Walkability
- **Fast food**
 - i. Advertisements that promoted price
 - j. Advertisements that included sugar-sweetened beverages
 - k. Number of healthy food options on the menu
 - l. Number healthy beverage options

The assessment of the physical activity environment included inventories and surveys of parks, school grounds, church grounds, and physical activity facilities, with documents adapted from Bridging the Gap (BTG). The assessment of community walkability was assessed with documents adapted from the National Center for Safe

Routes to School. Original forms can be found in Appendix A. CHL adapted forms can be found in Appendix B.

Section 2. Assessment of Parks

The Form used to assess parks is modified from the Bridging the Gap Program, University of Illinois at Chicago, Park Observation Form (See Appendix for form used). The purpose of this survey is to improve our understanding of accessibility of park settings and quality of opportunities for physical activity in these settings among CHL communities. A complete list of parks that were located within the community boundary, or on the periphery, and their locations was compiled for each community by local staff. Staff then assessed up to ten parks per community or all of them when there were less than ten parks in a community. Staff were instructed to spend about 30 minutes walking through each park to survey its accessibility, setting, amenities, sports fields (e.g., soccer, football, baseball), courts (e.g., tennis, basketball, volleyball), walking/running/biking trails, and incivilities.

Eligible parks: Local municipal or county park that is open to the public

- Has equipment used for physical activity or play, including playing fields and courts AND/OR has green space or natural features, benches, walking paths, picnic tables, or other park features
- On-the-ground parks only. Must also have a sign designating it as a public park if no sports features are present

Exclusions: Campgrounds, golf courses, forest preserves, stadiums, zoos, state and national parks, private/resident-only (e.g., neighborhood association) parks, stand-alone fields/courts associated with a school.

Park Setting, Parking, Sidewalks, and Amenities

Upon entering the park staff assessed the presence of certain park settings, parking and sidewalk features, and certain park amenities.

Observations on park setting included whether it was a public park, whether it was adjacent to a school, and whether it shared sports features with a school. In Aoloau, there were 2 parks with this information. Out of those 2 parks, all were other communal spaces, all were adjacent to a school, and 1 (50.0%) shared sports features with an adjacent school.

One (50.0%) of the parks had on-site parking, while no parks had on-site parking with overhead lighting, and none had bicycle parking. Only 1 (50.0%) park had a sidewalk leading up to the entrance of the school, and 1 (50.0%) park had sidewalks with overhead lighting.

Observations on park amenities included whether it had closing time signage, restrooms, showers, and beverage vending machines. Among the 2 parks with such information, none had closing time signage, none had restrooms, none had showers, and none had beverage vending machines.

Table S.2.1. Park Setting (N=2)

Park Setting	Number	Percent
Setting		
Public Park	0	0%
Adjacent to a school	2	100 %
Shares sports features with a school	1	50%
Parking		
Parking on-site available (not including street parking)	1	50%

Parking has lights	0	0%
Bicycle parking racks or cages available	0	0%
Sidewalk		
Sidewalks on street lead up to the entrance*	1	50%
Sidewalks have lighting	1	50%
Amenities		
Park has closing time signage	0	0%
Restrooms present	0	0%
Showers present	0	0%
Beverage vending machines present	0	0%

Park Access and Barriers to Entry

Staff assessed each park for an entrance fee, signage limiting entry and any physical barriers around the perimeter of the park. Among the 2 park surveyed in Tula, 1 park had information on entrance fee. The park did not have an entrance fee available. Among the two parks surveyed in Aoloau, none had signage indicating the park name, signage stating that public use of the park was limited to specific times, or signage indicating that the park was private or had restricted access at all times (e.g. no trespassing, school use only). Furthermore, none of the parks had a locked fence or other physical barrier around the perimeter.

Table S.2.2. Park Access and Barriers (N=2)

Access and Barriers		
Signage indicates park name	0	0%
Signage states public use of area is limited to specific times	0	0%

Signage states area is private or restricted access at all times	0	0%
Locked fence or other physical barrier around the perimeter prevents public access	0	0%

Sports Features

Staff assessed each park for a specific list of sports features to determine the number of each feature present and whether such a feature had lighting or not. Staff also rated the condition of each feature.

Feature Descriptions

- **Field, Multi-use:** A multi-use field is a large, flat, open space usable as an athletic field for more than one sport.
- **Field, Football:** A field should have the appropriate layout, markings, and/or equipment in order to be identified as a football field.
- **Field, Baseball:** A field should have the appropriate layout, markings, and/or equipment in order to be identified as a baseball field.
- **Field, Soccer:** A field should have the appropriate layout, markings, and/or equipment in order to be identified as a soccer field.
- **Court, Basketball:** A court should have the appropriate layout, markings, and/or equipment in order to be identified as a basketball court.
- **Court, Tennis:** A court should have the appropriate layout, markings, and/or equipment in order to be identified as a tennis court.
- **Court, Volleyball:** A court should have the appropriate layout, markings, and/or equipment in order to be identified as a volleyball court.
- **Court, Multi-use:** This includes large courts that contain equipment or the capability of holding equipment for different sports such as both basketball and volleyball.
- **Running/Walking Track:** A running/walking track may be located on the perimeter of a field or as part of a track and field stadium. Most tracks will have lane and/or distance markings.

- **Pool:** This includes–
 - a pool that is at least 3 feet deep at the deepest end.
 - a wading pool that is less than 3 feet deep at the deepest end and intended for use by small children.
- **Playground Area:** A playground area includes swings, monkey bars, climbing apparatuses, slides, see-saws, spring features, and other items meant for children’s play. In CHL survey, staff was trained to count only the number of areas, not the specific equipment or apparatuses.
- **Skateboarding Facilities:** Skateboarding facilities include ramps, tracks, and other apparatuses meant for use by skateboarders or in-line skaters. In CHL survey, staff was trained to count only the number of rooms or areas, not the specific equipment or apparatuses.
- **Exercise Stations with or without Signage:** Exercise stations are designated activity points. Exercise stations may also be called FitnessTrails or FitTrails.
- **Rock Climbing Wall:** A rock climbing wall is a natural or artificially constructed outdoor wall with grips for hands and feet, used for climbing.

Condition of the Feature

Staff rated the condition and the presence of lighting for each feature item. The condition of a feature could be recorded as “poor”, “okay/good”, or “not rated”. When there was more than one item per feature, each item was evaluated for condition while the presence of lighting was assessed across all items in a feature. For example, if a park had 3 basketball courts and 2 were in okay condition, 1 was in poor condition, and 1 of them had lighting, then the staff would record the number of basketball courts as 3, 2 of which are rated okay/good, 1 rated as poor, and one basketball courts had lighting.

Feature condition was rated based on the feature’s surface and related equipment, if any was available for the feature. Ultimately the feature condition rating was related to whether or not players could safely play or engage in physical activity on a feature without risking injury or falling. Staff took into consideration the type of activities that

would take place on or within a particular feature as well as the material comprising the surface when considering its condition. When assessing the condition of equipment used for physical activity, staff took into consideration age, functionality, wear and tear, damage such as dents or sharp edges, missing pieces, and rust. For example, if a playing surface was composed of concrete, staff assessed whether smooth concrete covered the entire surface and looked for cracks or uneven slabs in the concrete surface.

Survey Results for Sports Features

Across the three parks surveyed in Aoloau, there were a total of 2 features, of which all 2 were rated as poor. Among those 2 rated features, 100% were rated as poor.

Multiuse fields (1) and volleyball courts (1) were the most frequent features. The following table (Table S.2.3) summarizes the number of each sports feature, the conditions of the feature, and whether lighting was present for the feature across the 2 parks in Aoloau.

Table S.2.3. Sports Features Across 2 Parks in Aoloau

Feature	Total number of the feature	Condition of the Feature			Number of features w/ Lighting
		OK/Good	Poor	Not rated	
Field multiuse	1	0	1	0	1
Field football	0	0	0	0	0
Field baseball	0	0	0	0	0
Field soccer	0	0	0	0	0
Court basketball	0	0	0	0	0
Court tennis	0	0	0	0	0
Court volleyball	1	0	1	0	1
Court multiuse	0	0	0	0	0

Track	0	0	0	0	0
Pool	0	0	0	0	0
Playground	0	0	0	0	0
Skateboarding	0	0	0	0	0
Exercise Stations	0	0	0	0	0
Rock Climbing	0	0	0	0	0

Park Features and Amenities

Staff assessed each park for a specific list of features and amenities to determine if the feature or amenity was present and to rate the condition of the surface or feature.

When staff were unable to determine the condition of one or more features of a specific type (if more than one present), they rated the features of that type that were able to be rated. When any features of a specific type could not be rated due to construction/repairs or seasonal closure staff selected not rated.

Feature or Amenity Descriptions

- **Green Space:** This includes natural or landscaped space not specifically designated for physical activity
- **Beaches:** This includes natural or man-made beaches on the edge of water features such as lakes, rivers, and lagoons, as well as beaches at coastal parks.
- **Beaches Swimmable:** This includes any beach area with minimal shore break for a 3-5 year old to swim in.
- **Beaches Recreational:** This includes any beach with facilities for family picnics, barbecues, sports, water-sports, etc.
- **Beaches with Lifeguard:** This may be a swimmable beach, recreational beach, or both wherein lifeguards are present to monitor activities and to alert families of changing currents.

- **Other Water Features:** This includes natural or man-made bodies of water that may be present, including streams, creeks, rivers, ponds, lakes, lagoons, and in case of coastal parks, ocean.
- **Shelters:** This refers to a permanent structure with a roof to protect users from rain or sun. Walls are not required. Cloth or lattice canopies over picnic tables or exercise equipment and pergolas are not included.
- **Picnic Tables, Shaded:** This refers to a table top with benches, including outdoor lunch tables. Shade can be provided by tree or a structure.
- **Picnic Tables, not Shaded:** This refers to a table top with benches including outdoor lunch tables. These include tables without trees or a structure.
- **Benches:** Benches are structures designed to function as seating. These do not include picnic tables or retaining/supporting/landscaped walls whose primary function is not seating.
- **Drinking Fountains:** These include freestanding or attached water dispensers intended for drinking.
- **Decorative Water Fountains:** These include ornamental structures from which jet(s) or stream(s) of water is issued and reflecting pools. Decorative fountains are not used for drinking or swimming.
- **Trash Containers:** These are receptacles for litter and refuse that can be made of metal, plastic, or paper/plastic bags. They may be stand-alone or attached to a building.
- **Grills/Fire Pits:** These are structures designed for cooking meats or other foods over open fire. A fire pit may be built directly into the ground or may be a wide and low metal container that holds coals or wood.
- **Fence:** Large areas of the park are enclosed by a fence.
- **Trails:** These include paved or unpaved pathways or footpaths for walking, biking, roller-skating, etc. Trails are distinct from running/walking tracks in that they tend not follow a strict oval shape, but will usually follow an irregular direction and cover a greater distance than a track.

Survey Results of Park Features and Amenities

Among the 2 parks surveyed in Aoloau, there were a total of 3 features and amenities, of which 1 was rated as ok/good and 2 were rated as poor. Among the rated features and amenities, 1 (33.3%) was rated as ok/good. The most common features and amenities present were green space and fences. Table S.2.4. summarizes the total number and condition of each individual feature/amenities which was assessed.

Table S.2.4. Park Features and Amenities Across 2 Parks in Aoloau

Feature	Total Number of the Feature	Condition of the Feature		
		OK/Good	Poor	Not rated
Green Space	2	1	1	0
Beach swim	0	0	0	0
Beach recreational	0	0	0	0
Beach lifeguard	0	0	0	0
Waterpark	0	0	0	0
Shelters	0	0	0	0
Picnic Tables w/Shade	0	0	0	0
Picnic Tables w/o Shade	0	0	0	0
Benches	0	0	0	0
Drinking fountain	0	0	0	0
Décor fountain	0	0	0	0
Trash bins	0	0	0	0
Grills	0	0	0	0
Fence	1	0	1	0

Trails	0	0	0	0
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Incivilities

Staff assessed each park for a list of incivilities and how much each was present. The term incivility is used to describe items in the environment that might discourage physical activity. These items are often signs of area deprivation. The following items in this section were used to assess the physical disorder of the park grounds environment.

- **Garbage/Litter:** Includes paper, packaging, and other items of refuse not included in other categories below.
 - **Broken Glass:** Includes any types of broken glass, such as bottles, etc.
- **Graffiti/Tagging:** Refers to “unapproved” writing such as painted or drawn signs or symbols (e.g., gang insignia) on the building and/or exterior property. Do not include painted murals or public art.
- **Evidence of Alcohol Use:** This includes beer or other alcohol-related bottles, cans or caps littering the ground or in/around overflowing trash cans. You do not need to check inside the trash cans for evidence of alcohol use.
- **Evidence of Substance Abuse:** This includes syringes, baggies, rolling papers, etc.
- **Sex Paraphernalia:** This includes condoms, condom wrappers, or other contraceptive device/material, or visible pornographic reading material.
- **Dog Refuse:** There is dog refuse visible.
- **Dogs Unattended:** There are dogs who wander the facility not under advice or leash.
- **Vandalism:** There are evidences of broken windows or other broken features.

Staff looked for incivilities throughout the park and assigned a score for each incivility type based upon the amount that was present across the park settings. The possible ratings were: none (0), a little (1), some (2), and a lot (3). For the community, average rating for each of the item was used. Mean

rating across all 9 items were then used as an overall rating of incivilities across all parks surveyed in that community.

Among the two parks in Aoloau, there was a little bit of incivilities (mean=0.2; sd=0.1). There was no evidence of broken glass, graffiti/tagging, evidence of alcohol use, evidence of substance abuse, sex paraphernalia, and no vandalism. However, there was on average, a little bit of garbage, dog refuse, and dogs left unattended (Table S.2.5).

Table S.2.5. Average Amount of Each Incivility Across 2 Parks in Aoloau

Incivility Type	Amount
Garbage	A little
Broken glass	None
Graffiti/Tagging	None
Evidence of Alcohol use	None
Evidence of Substance Abuse	None
Sex Paraphernalia	None
Dog Refuse	A little
Dogs Unattended	A little
Vandalism	None

Section 3. Assessment of Schools

Method: The tool used to assess schools is modified from the Bridging the Gap Program, University of Illinois at Chicago, School Observation Form (See APPENDIX for form used). The purpose of this survey is to improve our understanding of the availability and quality of physical activity features that are located on school grounds in CHL communities. A complete list of schools that were located within the community boundary, or on the periphery, and their locations was compiled for each community by local staff. Staff then assessed up to ten schools per community or assessed all of them when there were fewer than ten schools in a community. Staff were instructed to spend about 30 minutes walking through each school grounds to survey its accessibility, setting, amenities, sports fields (e.g., soccer, football, baseball), courts (e.g., tennis, basketball, volleyball), other features (e.g. track, pool, and playground) and incivilities.

Eligible schools: All school grounds were eligible for assessment. This includes schools sharing some sports features with an adjacent park.

School Setting, Parking, Sidewalks, and Amenities

Method: Upon entering the school, staff assessed the presence of certain school settings, parking and sidewalk features, and certain school amenities.

Observations on school setting included whether it was adjacent to a park. In Aoloau, there were 2 schools with this information. Out of the 2 schools, none were adjacent to a park, and none shared sports features with an adjacent park.

Among the 2 schools, 1 (50%) of the schools had on-site parking, while no schools had on-site parking with overhead lighting, and none had bicycle parking. None had a sidewalk leading up to the entrance of the school, and none had sidewalks with overhead lighting.

Observations on school amenities included whether it had closing time signage, restrooms, showers, and beverage vending machines. Among the 2 schools with such information, 1 (50%) had closing time signage, all 2 (100%) had restrooms, 1 (50%) had showers, and none had beverage vending machines.

Table S.3.1. School Setting (N=2)

School Setting	Number	Percent
Setting		
Adjacent to a park	0	0%
Shares sports features with a park	0	0%
Parking		
Parking on-site available (not including street parking)	1	50%
Parking has lights (n=1)	0	0%
Bicycle parking racks or cages available	0	0%
Sidewalk		
Sidewalks on street lead up to the entrance	0	0%
Sidewalks have lighting	0	0%
Amenities		
School has closing time signage	1	50%
Restrooms present	2	100%
Showers present	1	50%
Beverage vending machines present	0	0%

School Access and Barriers to Entry

Staff assessed each school for signage limiting entry and any physical barriers around the perimeter of the school. Among the two schools surveyed in Aoloau, 2 (100%) had signage indicating the school name, 1 (50%) had signage stating that public use of the school was limited to specific times (e.g., after school), 1 (50%) had signage indicating that the school was private or had restricted access at all times (e.g. no trespassing, school use only), and none had a locked fence or other physical barrier around the perimeter.

Table S.3.2. School Access and Barriers (N=2)

Access and Barriers		
Signage indicates school name	2	100%
Signage states public use of area is limited to specific times	1	50%
Signage states area is private or restricted access at all times	1	50%
Locked fence or other physical barrier around the perimeter prevents public access	0	0%

Sports Features

Staff assessed each school for a specific list of sports features to determine the number of each feature present and whether such a feature had lighting or not. Staff also rated the condition of each feature. These features are the same as those included in the assessment of parks.

Condition of the Feature

Staff rated the condition and the presence of lighting for each feature item. The condition of a feature could be recorded as “poor”, “okay/good”, or “not rated”. When there was more than one of a particular feature, each was evaluated for condition while the presence of lighting was assessed across all features. For example, if a school had

3 basketball courts and 2 were in okay condition, 1 was in poor condition, and 1 of them had lighting, then the staff would record the number of basketball courts as 3, 2 of which were rated okay/good, 1 was rated as poor, and that this school had lighting for this feature.

Feature condition was rated based on the feature's surface and related equipment, if any was available for the feature. Ultimately the feature condition rating was related to whether or not players could safely play or engage in physical activity on a feature without risking injury or falling. Staff took into consideration the type of activities that would take place on or within a particular feature as well as the material comprising the surface when considering its condition. When assessing the condition of equipment used for physical activity, staff took into consideration age, functionality, wear and tear, damage such as dents or sharp edges, missing pieces, and rust. For example, if a playing surface was composed of concrete, staff assessed whether smooth concrete covered the entire surface and looked for cracks or uneven slabs in the concrete surface. See APPENDIX C for a detailed protocol on how each sports feature was rated for condition.

Survey Results for Sports Features

Across the two schools surveyed in Aoloau, there were a total of 3 sports features, of which 2 were rated as ok/good and 1 was not rated. Among the 2 rated features, 100% were rated as ok/good.

Playgrounds were the most frequent features (2), followed by multiuse courts (1). Playgrounds may be of particular interest to families with young children. Among the 2 playgrounds in Aoloau, 1 was rated ok/good while 1 was not rated, and 1 of the schools had a playground area with lighting. The following table (Table S.3.3) summarizes the number of each sports feature, the conditions of the feature, and whether lighting was present for the feature across all 2 schools in Aoloau.

Table S.3.3. Sports Features Across all 2 Schools in Aoloau

Feature	Total number of the feature	Condition of the Feature			Number of schools w/ Lighting
		OK/Good	Poor	Not rated	
Field multiuse	0	0	0	0	0
Field football	0	0	0	0	0
Field baseball	0	0	0	0	0
Field soccer	0	0	0	0	0
Court basketball	0	0	0	0	0
Court tennis	0	0	0	0	0
Court volleyball	0	0	0	0	0
Court multiuse	1	1	0	0	0
Track	0	0	0	0	0
Pool	0	0	0	0	0
Playground	2	1	--	1	1
Skateboarding	0	0	0	0	0
Exercise Stations	0	0	0	0	0
Rock Climbing	0	0	0	0	0

School Features and Amenities

Method: Staff assessed each school for a specific list of features and amenities to determine if the feature or amenity was present and to rate the condition of the surface or feature. These features are the same as those included in the assessment of parks.

When staff were unable to determine the condition of one or more features of a specific type (if more than one present), they rated the features of that type that were able to be rated. When any features of a specific type could not be rated due to construction/repairs or seasonal closure, staff selected not rated.

Survey Results of School Features and Amenities

Among the 2 schools in Aoloau, there were a total of 6 features and amenities, of which 4 were rated as ok/good and 2 were rated as poor. Among the rated features and amenities, 66.7% were rated as ok/good. The most common features and amenities present were fences, green space, shelters, drinking fountains, and trash bins. Table S.3.4. summarizes the total number and condition of each individual feature/amenity which was assessed.

Table S.3.4. Features and Amenities Across all 2 Schools in Aoloau

Feature	Total Number of the feature	Condition of the Feature		
		OK/Good	Poor	Not rated
Green Space	1	0	1	0
Beach for swimming	0	0	0	0
Beach, recreational	0	0	0	0
Beach with lifeguard	0	0	0	0
Waterpark	0	0	0	0
Shelters	1	1	0	0
Picnic Tables w/ Shade	0	0	0	0
Picnic Tables w/o Shade	0	0	0	0
Benches	0	0	0	0
Drinking fountain	1	0	1	0
Decorative fountain	0	0	0	0
Trash bins	1	1	0	0

Grills	0	0	0	0
Fence	2	2	0	0
Trails	0	0	0	0

Incivilities

Method: Staff assessed each school for a list of incivilities and how much each was present. The term incivility is used to describe items in the environment that might discourage physical activity. These items are often signs of area deprivation or markers of blight. The following items in this section were used to assess the physical disorder of the school grounds environment. These incivilities are the same as those included in the assessment of parks.

Amount of Incivilities

Staff looked for incivilities throughout the school and assigned a score for each of 9 incivility types based upon the amount that was present across the school settings. The possible ratings were: none (0), a little (1), some (2), and 3 (a lot). For the community, average rating for each of the item was used.

Among the two schools in Aoloau, there was no evidence of garbage, broken glass, graffiti/tagging, evidence of alcohol use, evidence of substance abuse, sex paraphernalia, dog refuse, dogs left unattended, or vandalism. (Table S.3.5).

Table S.3.5. Average Amount of Each Incivility Across all 2 Schools in Aoloau

Incivility Type	Amount
Garbage	None
Broken glass	None

Graffiti/Tagging	None
Evidence of Alcohol use	None
Evidence of Substance Abuse	None
Sex Paraphernalia	None
Dog Refuse	None
Dogs Unattended	None
Vandalism	None

Section 4. Assessment of Churches

Method: The tool used to assess churches is modified from the Bridging the Gap Program, University of Illinois at Chicago, Park Observation Form (See APPENDIX for form used). The purpose of this survey is to improve our understanding of the availability and quality of physical activity features that are located on church grounds in CHL communities. This assessment was only performed in jurisdictions where churches are commonly used as places for physical activity. A complete list of churches that had some outdoor physical activity features, such as fields, and that were located within the community boundary, or on the periphery, and their locations, was compiled for each community by local staff. Staff then assessed up to ten churches per community or assessed all of them when there were fewer than ten churches in a community. Staff were instructed to spend about 30 minutes walking through the grounds of each church to survey its accessibility, setting, amenities, sports fields (e.g., soccer, football, baseball), courts (e.g., tennis, basketball, volleyball), other features (e.g. track, pool, and playground) and incivilities.

Eligible Churches: The grounds of any church that had outdoor physical activity features and was on the inventory list were eligible for assessment.

Church Setting, Parking, Sidewalks, and Amenities

Method: Upon entering the church grounds, staff assessed the presence of certain church settings, parking and sidewalk features, and certain church amenities.

In Aoloau, there were 3 churches. Observations on church settings included whether it was within a quarter mile of another community feature (e.g. a school, housing, food store). Among the 3 churches, 2 (66.7%) churches were near another sport area.

Of the 3 churches, 3 (100%) had on-site parking, while 2 (66.7%) churches had on-site parking with overhead lighting. None had a sidewalk leading up to the entrance of the church or sidewalks with lighting overhead. None of the churches had bicycle parking.

Observations on church amenities included whether it had closing time signage, restrooms, showers, and beverage vending machines. Among the 3 churches, none had closing time signage, 3 (100%) had restrooms, none had showers, and none had beverage vending machines.

Table S.4.1. Church Setting (N=3)

Church Setting	Number	Percent
Setting		
Within ¼ of a mile from another community feature	2	66.7%
Parking		
Parking on-site available (not including street parking)	3	100%
Parking has lights	2	66.7%
Bicycle parking racks or cages available	0	0%
Sidewalk		
Sidewalks on street lead up to the entrance	0	0%
Sidewalks have lighting	0	0%

Amenities		
Church has closing time signage	0	0%
Restrooms present	3	100%
Showers present	0	0%
Beverage vending machines present	0	0%

Church Access and Barriers to Entry

Staff assessed each church for signage limiting entry and any physical barriers around the perimeter of the church. Among the three churches surveyed in Aoloau, none had signage indicating the church name, 3 (100%) had signage stating that an area was open to the public, none had signage indicating that an area was open to church members only, 2 (66.7%) had signage indicating that use of an area was limited to specific times, 3 (100%) had signage that use of an area required permission (e.g. from a minister or deacon), 2 (66.7%) had signage stating that supervision was needed (e.g. by an adult or minister), none had signage stating that an area was private or restricted at all times, and 2 (66.7%) had a locked fence or other physical barrier around the perimeter.

Table S.4.2. Church Access and Barriers (N=3)

Access and barriers		
Signage indicates church name	0	0%
Signage states an area is open to the public	3	100%
Signage states an area is open to church members only	0	0%
Signage indicates that use of an area was limited to specific times	2	66.7%

Signage states that use of an area required permission	3	100%
Signage states that supervision was needed	2	66.7%
Signage states area is private or restricted access at all times	0	0%
Locked fence or other physical barrier around the perimeter prevents public access	2	66.7%

Sports Features

Staff assessed each church for a specific list of sports features to determine the number of each feature present and whether such a feature had lighting or not. Staff also rated the condition of each feature. These features are the same as those included in the assessment of parks.

Condition of the Feature

Staff rated the condition and the presence of lighting for each feature item. The condition of a feature could be recorded as “poor”, “okay/good”, or “not rated”. When there was more than one of a particular feature, each was evaluated for condition while the presence of lighting was assessed across all features for each church. For example, if a church had 3 basketball courts and 2 were in okay condition, 1 was in poor condition, and 1 of them had lighting, then the staff would record the number of basketball courts as 3, 2 of which were rated okay/good, 1 was rated as poor, and that this church had lighting for this feature.

Feature condition was rated based on the feature’s surface and related equipment, if any was available for the feature. Ultimately the feature condition rating was related to whether or not players could safely play or engage in physical activity on a feature without risking injury or falling. Staff took into consideration the type of activities that would take place on or within a particular feature as well as the material comprising the

surface when considering its condition. When assessing the condition of equipment used for physical activity, staff took into consideration age, functionality, wear and tear, damage such as dents or sharp edges, missing pieces, and rust. For example, if a playing surface was composed of concrete, staff assessed whether smooth concrete covered the entire surface and looked for cracks or uneven slabs in the concrete surface.

Survey Results for Sports Features

Across the three churches surveyed in Aoloau, there were a total of 3 sports features, of which 1 was rated as ok/good and 2 were rated as poor. Among the rated features, 33% were ok/good. Multiuse fields were the most common sports features (2), followed by volleyball courts (1).

The following table (Table S.4.3) summarizes the number of each sports feature, the conditions of the feature, and whether lighting was present for the feature across all 3 churches in Aoloau.

Table S.4.3. Sports Features Across 3 Churches in Aoloau

Feature	Total number of the feature	Condition of the Feature		
		OK/Good	Poor	Not rated
Field multiuse	2	1	1	0
Field football	0	0	0	0
Field baseball	0	0	0	0
Field soccer	0	0	0	0
Court basketball	0	0	0	0
Court tennis	0	0	0	0
Court volleyball	1	0	1	0
Court multiuse	0	0	0	0

Track	0	0	0	0
Pool	0	0	0	0
Playground	0	0	0	0
Skateboarding	0	0	0	0
Exercise Stations	0	0	0	0
Rock Climbing	0	0	0	0

Church Features and Amenities

Method: Staff assessed each church for a specific list of features and amenities to determine if the feature or amenity was present and to rate the condition of the surface or feature. These features are the same as those included in the assessment of parks.

When staff were unable to determine the condition of one or more features of a specific type (if more than one present), they rated the features of that type that were able to be rated. When any features of a specific type could not be rated due to construction/repairs or seasonal closure, staff selected not rated.

Survey Results of Church Features and Amenities

Among the 3 churches in Aoloau, there were a total of 7 features and amenities, of which 5 were rated as ok/good and 2 were rated as poor. The most common features and amenities present were green space (3), fences (2), shelters (1), and trash bins (1). Table S.4.4. summarizes the total number and condition of each individual feature/amenity which was assessed.

Table S.4.4. Features and Amenities Across 3 Churches in Aoloau

Feature	Total Number of the feature	Condition of the Feature		
		OK/Good	Poor	Not rated

Green Space	3	1	2	0
Beach for swimming	0	0	0	0
Beach, recreational	0	0	0	0
Beach with lifeguard	0	0	0	0
Waterpark	0	0	0	0
Shelters	1	1	0	0
Picnic Tables w/ Shade	0	0	0	0
Picnic Tables w/o Shade	0	0	0	0
Benches	0	0	0	0
Drinking fountain	0	0	0	0
Decorative fountain	0	0	0	0
Trash bins	1	1	0	0
Grills	0	0	0	0
Fence	2	2	0	0
Trails	0	0	0	0

Incivilities

Method: Staff assessed each church for a list of incivilities and how much each was present. The term incivility is used to describe items in the environment that might discourage physical activity. These items are often signs of area deprivation or markers

of blight. The following items in this section were used to assess the physical disorder of the church grounds environment. These incivilities are the same as those included in the assessment of parks.

Amount of Incivilities

Staff looked for incivilities throughout the church and assigned a score for each of 9 incivility types based upon the amount that was present across the church settings. The possible ratings were: none (0), a little (1), some (2), and 3 (a lot). For the community, average rating for each of the item was used.

Among the 3 churches in Aoloau, there were no incivilities. There was no evidence of garbage, broken glass, graffiti/tagging, evidence of alcohol use, evidence of substance use, sex paraphernalia, dog refuse, dogs left unattended, and no vandalism was present (Table S.4.5).

Table S.4.5. Average Amount of Each Incivility Across 3 Churches in Aoloau

Incivility Type	Amount
Garbage	None
Broken glass	None
Graffiti/Tagging	None
Evidence of Alcohol use	None
Evidence of Substance Abuse	None
Sex Paraphernalia	None
Dog Refuse	None
Dogs Unattended	None
Vandalism	None

Section 5. Food Availability and Marketing Form

CHL's Food Availability Survey and Marketing Form is modified from the California Department of Health Communities of Excellence in Nutrition, Physical Activity, and Obesity Prevention program (CX3). The purpose of this survey is to assess the availability of healthy foods, price, nutrition information, and marketing of foods in stores. In addition to the food environment, we surveyed the safety and walkability around stores. A complete list of food stores, including their locations, was compiled for each community by local staff. Staff then assessed up to ten stores per community or all of them when there were less than ten stores in a community. The types of stores assessed include supermarket chain, large grocery store, small market, convenience store, and other community sources for food products.

Supermarket Chain: a large store that sells food and other items, including canned and frozen foods, fresh fruits and vegetables, and fresh (raw) and prepared meats, fish, and poultry. It is owned by a company that has many stores such as Safeway, K-mart, payless. (This type of store has twenty or more employees and at least 4 cash registers.)

Large Grocery Store (not part of a large chain): a large store that sells food and other items, including canned and frozen foods, fresh fruits and vegetables, and fresh (raw) and prepared meats, fish, and poultry. It may be part of a small regional chain of fewer than 5 stores or may be independent. (This type of store also has twenty or more employees and at least 4 cash registers.)

Small Market: usually an independent store that sells food including canned and frozen foods, fresh fruits and vegetables, and fresh (raw) and prepared meats, fish, and poultry as well as convenience items and alcohol. (This type of store has fewer than 20 employees and 3 or less cash registers.)

Convenience: a store that sells convenience items only, including bread, milk, soda, snacks and may sell alcohol and gasoline. These stores do not sell fresh (raw) meat. These stores also are known as food marts.

Other: a store that does not fit into supermarket chain, large grocery store, small market or convenience, but is seen by the community as a general source of food products. Examples would include farmers market, dollar stores or drug stores.

The following table is a breakdown of the store types surveyed in Aoloau. Among the 2 stores assessed, the most common store types in Aoloau were small market stores (2).

Table S.5.1. Type of Store (N=2)

Type	Number	Percent
Supermarket chain	0	0%
Large grocery store	0	0%
Small market	2	100%
Convenience	0	0%
Other	0	0%

Federal Food Assistance Acceptance at Store (WIC and Food Stamps/SNAP)

Stores were assessed for whether or not they accept Federal Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and Food Stamps/SNAP benefits. WIC provides Federal grants to States to provide supplemental foods to low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk (USDA, 2015). The Supplemental Nutrition Assistance Program (SNAP) offers nutrition assistance to eligible, low-income individuals and families.

Stores were also assessed on whether or not they display signage saying “We Accept WIC” and “We Accept Food Stamps/EBT” (electronic benefit transfer). Among the 2 store surveyed, all stores had information on participating in WIC or Food Stamps/EBT. Among the 2 stores, 1 (50%) accepts WIC and 1 (50%) accepts Food Stamps/EBT. Among the 2 stores with information on signage, none displayed signage for WIC being accepted, while 1 (50%) displayed signage for Food Stamps/EBT being accepted.

Table S.5.2. Benefits (N=2)

Federal Benefits	Number	Percent
Accepts WIC	1	50%
Accepts Food Stamps or a SNAP vendor	1	50%
“We Accept WIC” signage displayed	0	0%
“We Accept Food Stamps/EBT” signage displayed	1	50%

Variety, Quality, and Availability of Fruits and Vegetables and Other Health Foods

Staff looked at the overall variety, quality, and availability of specific fruits and vegetables in stores. Stores were assessed for whether they had a wide variety (7 or more types), moderate variety (4-6 types), limited variety (1-3 types) or none of fruits and vegetables, separately. Of the 1 out of 2 stores with this data in Aoloau, 1 (100%) store had a limited variety of fruit, and 1 (100.0%) store had a moderate variety of vegetables.

Table S.5.3. Variety of Fruits and Vegetables (N=2)

Variety	Number	Percent
Fruits		
None	0	0%
Limited (n=1)	1	100%

Moderate variety	0	0%
Wide variety	0	0%
Vegetables		
None	0	0%
Limited	0	0%
Moderate variety (n=1)	1	100%
Wide variety	0	0%

Stores were also assessed on the quality of their fruits and vegetables. Staff looked for signs of quality in the produce such as the lack of wilting, decay, shriveling, brown stems, and color changes.

- **Wilting** - leaves or stems are limp
- **Decay** - mold or blackening
- **Shriveling** - skin has wrinkles
- **Brown stems/dry stem cuts**
- **Color changes** - yellowing when item should be dark green

The quality was rated as:

- **None** - None sold
- **Poor** - All or most of fruit is of poor quality (brown, bruised, overripe, wilted)
- **Mixed Poor** - Mixed quality; more poor than good
- **Mixed Good** - Mixed quality; more good than poor
- **Good** - All or most of fruit is of good quality (very fresh, no soft spots, excellent color)

Of the 2 stores in Aoloau assessed for quality, 1 (100%) had mixed good quality for fruits and 1 (100%) had mixed good quality for vegetables.

Table S.5.4. Quality of Fruit and Vegetables (N=2)

Quality	Number	Percent
Fruit		
None	0	0%
Poor	0	0%
Mixed Poor	0	0%
Mixed Good	1	100%
Good	0	0.0%
Vegetable		
None	0	0%
Poor	0	0%
Mixed Poor	0	0%
Mixed Good	1	100%
Good	0	0%

Stores were assessed for the availability and price of specific fruits (apple, banana, and orange) and vegetables (carrot, tomato, broccoli, and cabbage). A total of 1 store in Aoloau had data on the availability of these produce. The most commonly available fruits were apples and oranges in which were each in 1 (100%) of stores. Carrots and cabbage were each in 1 (100%) of the stores.

Table S.5.5. Availability of Selected Fruits and Vegetables (N=1)

Availability	Number	Percent
Selected fruit		

Apple	1	100%
Banana	0	0%
Orange	1	100%
Selected vegetable		
Carrot	1	100%
Tomato	0	0%
Broccoli	0	0%
Cabbage	1	100%

Stores were assessed for the availability of other healthy foods. **Healthy foods** are fruits and vegetables, whole grains, beans, nuts and seeds, non-fat and low fat milk products, and lean meat, poultry, and fish. Healthy foods include minimal or no added fat, sugars, or sweeteners. Unsweetened black coffee is included. Pickled vegetables, whole coconut, and coconut water are included.

Stores were specifically assessed for a variety of items considered to be low/reduced fat dairy or soy drinks, lean meat protein, non-meat protein, whole-grain, canned/frozen fruit or vegetables, and baby food. Among the 2 stores assessed in Aoloau, only 1 store had information available. The store lacked at least one low/reduced fat dairy or soy beverage, 1 (100%) had at least one lean meat protein, 1 (100%) had at least one non-meat protein, 1 (100%) had at least one whole-grain item, 1 (100%) had at least one canned/ frozen fruit or vegetable, and 1 (100%) had at least one baby food.

Table S.5.6. Availability of Other Healthy Foods in Stores (N=1)

Other Healthy Foods	Number	Percent
Low/reduced fat dairy or soy beverage	0	0%
1% milk	0	0%

Other Healthy Foods	Number	Percent
2% milk	0	0%
Skim milk	0	0%
Mozzarella	0	0%
Flavored soy beverage	0	0%
Plain soy beverage	0	0%
Lean meat protein	1	100%
Ground beef or turkey, lean (85% or higher)	1	100%
Whole chicken	0	0%
Tuna (light) canned in water	1	100%
Salmon canned in water	1	100%
Sardines canned in water, tomato, or mustard	1	100%
Non-meat protein	1	100%
Tofu, plain	0	0%
Beans, dried	1	100%
Beans, canned with no added fats, sugar or sweetener	0	0%
Whole grain	1	100%
Whole grain bread	0	0%
Brown rice	0	0%
High fiber cereal (≥ 3 grams fiber, ≤ 12 grams sugar per serving)	1	100%
Oatmeal (plain)	1	100%
Tortillas, soft corn or whole wheat (no lard)	0	0%

Other Healthy Foods	Number	Percent
Canned/frozen fruit or vegetables	1	100%
Any canned fruit packed in 100% fruit juice	1	100%
Any canned vegetable with no added fats, sugar, or sweetener	1	100%
Any frozen fruit with no added fats, sugar, or sweetener	1	100%
Any frozen vegetable with no added fats, sugar, or sweetener	0	0%
Baby food	1	100%
Baby food, jarred, single fruit	1	100%
Baby food, jarred, single vegetable	0	0%
Baby food, jarred, single meat	1	100%

Store Interior Advertisements or Promotions

Stores were assessed for specific ads or promotion themes in the interior of the store. First, staff looked to see if there were health promotion items around the fruit and vegetables display. Of the 2 stores with this data, 0 (0%) had a health promotion item. Staff then categorized each health promotion item into one of the following themes:

- 5 A Day signs
- Nutrition information
- Fruit and Veggies: More matters
- Children’s Healthy Living (CHL) or CHL partnership
- Other

In Aoloau, there were no health promotion items. Stores were also assessed for ads promoting locally grown produce. Of the 2 stores with this data, none promoted locally grown produce.

Table S.5.7. Advertisements Inside the Store (N=2)

Interior Advertisements	Number	Percent
Health promotion around the fruit and vegetable display	0	0%
5 A Day signs	0	0%
Nutrition information	0	0%
Fruit and Veggies: More matters	0	0%
Children’s Healthy Living (CHL) or CHL partnership	0	0%
Other	0	0%
Promotion of locally grown produce	0	0%

Staff looked at the marketing (presence of ads and product placement) of specific healthy and unhealthy foods near the main check-out area. The presence of ads or promotions recorded included those next to or below the check out, on the floor, or hanging from the ceiling. The presence of products recorded included those next to or below the check out and near the exit doorway.

The healthy products surveyed include the following:

- Granola bars (whole grain, ≥ 2 g fiber, ≤ 1 g saturated fat, ≤ 14 g sugar per serving)
- Bagged Nuts/seeds (does not include honey roasted or w/ added sugar) (next to or below counter/check-out)
- Fresh fruit (next to or below counter/check-out)
- Bottled water (next to or below counter/check-out)
- Other: specify (such as dried fruit, trail mix, 100% juice, etc.)

The unhealthy products surveyed include the following:

- Gumball or candy machine (next to counter or exit doorway)
- Candy (next to or below counter/check-out)
- Soda (next to or below counter/check-out)
- Chips (next to or below counter/check-out)
- Other: specify (such as cookies, ice cream, beef jerky, energy drinks, etc.)

Among the 2 stores surveyed, 1 store had information on the marketing near the main check-out area. Looking at ads for healthy food products, the store had 0 ads. Looking at ads unhealthy food products, the store had ads for 3-4 items. More stores had a least one ad for unhealthy food products compared to ad for healthy food products near the main check-out area (1 versus 0).

Looking at the presence of healthy food products near the main check-out area, the store had 1-2 items. Looking at the presence of unhealthy food products near the main check-out area, the store had 0 items. More stores had at least one healthy food product compared to unhealthy food product near the main check-out area (1 versus 0).

Table S.5.8. Store Check-out area Marketing (N=1)

Marketing next to the main check-out area	Healthy Food Products (n)	Unhealthy Food Products (n)
Presence of ads or promotions		
0	1	0
1-2 items	0	0
3-4 items	0	1
Presence of products		
0	0	1
1-2 items	1	0

3-5 items	0	0
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Store Exterior Advertisements on Healthy and Unhealthy Foods

Stores were assessed for ads promoting healthy or unhealthy foods on the exterior of the store. **Unhealthy products** are high calorie, low nutrient foods and beverages that include alcoholic beverages, soft drinks and other sweetened beverages including diet drinks, sweet desserts and highly sugared cereals, chips and other salty snacks, most solid fats, fried foods, and other foods with high amounts of sugar, fat and/or sodium. **Healthy products** include minimal or no added fat, sugars, or sweeteners. Examples include fresh or dried fruits and vegetables, whole grain snacks (≥ 2 g fiber per serving), energy bars (≤ 14 g sugar per serving), nuts and seeds, non-fat and low fat milk products, water, or 100% fruit juice.

Among the 2 stores that had data on the presence of exterior ads for healthy foods, none had ads on healthy foods. Among the 2 stores that had data on the presence of exterior ads for unhealthy foods, 1 (50%) had ads for unhealthy foods.

Store Exterior Conditions

Stores were assessed for specific exterior conditions for food promotion. Among the 2 stores surveyed, none had produce bins on the sidewalk in front of the store. No stores had other products (e.g., soda, water) displayed on the sidewalk in front of the store or inside the store next to the window so they are clearly visible from the outside. There was no vending machine on the sidewalk in front of any of the 2 stores surveyed. One store had ads on the roof, walls, or anywhere on the store property of the 2 stores surveyed. One store (50%) had images of unhealthy foods and/or beverages painted on doors or windows of the storefront, while no stores had images of healthy foods and/or beverages. None of the stores had painted murals of healthy food and/or beverages on the building walls of the store.

Table S.5.9. Store Exterior Conditions (N=2)

Exterior Conditions	Number	Percent
Produce bins on the sidewalk in front of the store	0	0%
Products displayed on the sidewalk in front for the store or inside the store next to the window	0	0%
Vending machines on the sidewalk in front of the store	0	0%
Advertising (banners, posters, temporary signs, etc.) on the roof, walls or elsewhere on the property (n=1)	1	100%
Images of healthy food (e.g. tomato, apple) and/or beverages (e.g. milk) painted on doors or windows of the storefront	0	0%
Images of unhealthy food (e.g. hamburger, hot dog) and/or beverages (e.g. soda, shake) painted on doors or windows of the storefront	1	50%
Painted murals of healthy foods and/or beverages anywhere on the building walls	0	0%

Perceptions of Safety at Store

Store were assessed for perceptions of safety including whether there were bars or chains on the exterior, whether advertisements covered no more than 1/3 of the window area and the cash register could be seen from the outside for stores that sold alcoholic beverages (e.g. the Lee Law which was passed in California), whether people felt safe walking in and around the store, and if the store was located in a safe, walkable environment. Among the 2 stores with this information, 1 (50%) store had bars. None of the stores complied with Lee Law. None of the stores were rated that people feel safe during the walk around or outside of the store. None of the stores met standards for being located in a safe, walkable environment.

Table S.5.10. Perceived Safety of Store (N=2)

Safety	Number	Percent
Store has bars or chains on windows or doors	1	50%
Store sells alcohol and no more than 1/3 of window area is covered with ads (Lee Law)	0	0%
People feel safe during the walk around or outside of the store	0	0%
Store meets standards for being located in a safe, walkable environment	0	0%

Overall Summary of Store Assessments

Among the 2 stores surveyed in Aoloau there were strengths and areas needing improvement in order for stores to support community health.

WIC and Food Stamps/SNAP benefits:

- 1 store accepted Food Stamp/SNAP benefits and 1 store accepted WIC; signage on the store exterior for accepting these benefits can be improved for the two stores which lacked WIC signage and the one store which lacked Food Stamps/EBT signage.

Variety, Quality, and Availability of Fruits and Vegetables and Other Healthy Foods

- Of the 2 stores in Aoloau, none had a wide variety of fruit and none had a wide variety of vegetables.
- For the two stores that had fruits and vegetables, the stores can improve the availability of common fruits and vegetables.
- Among the 1 store assessed and had data for Other Healthy Foods, the store lacked at least one low/reduced fat dairy or soy beverage item.

Ads, promotions, and marketing

- Among the 2 stores in Aoloau, none of the stores had health promotion items around the fruit and vegetables display and none of them had promotion of locally grown produce.
- Stores in Aoloau are more likely to have ads for unhealthy food products than healthy food products near the main check out area (1 store versus 0 stores). However, more stores had at least one healthy food product compared to unhealthy food product near the main check-out area (1 versus 0).
- On the store exterior 1 store had ads for unhealthy foods, while none had ads for healthy foods.
- Looking at the store exterior conditions, there were no produce bins on the sidewalk in front of the stores. The stores had no images of healthy food and/or beverages painted on doors or windows of the storefront. 1 (50%) store had images of unhealthy foods and/or beverages. None had painted murals of healthy foods and/or beverages anywhere on the building walls.

Perceptions on Safety around the Store

- Of the 2 stores in Aoloau, 1 (50%) had bars or chains on the windows, none were rated as people feeling safe around or outside of the store, and none were in a location deemed to be a safe, walkable environment.
- The store did not meet the standards of California's Lee Law to limit the amount of space taken by advertisements for alcohol on the store exterior.

Section 6. Walkability Survey

Everyone benefits from walking. These benefits include: improved fitness, cleaner air, reduced risks of certain health problems, and a greater sense of community, but walking needs to be safe and easy.

CHL staff conducted two separate walkability survey in Aoloau. The survey included a checklist of items to be observed and rated, which are related to the safety and quality of the walk. The individual scores for these items were then added for a total score to get an overall rating for the community walkability.

Rating Scale for Each Walking Feature	Total Walkability Score	Community Walkability
1=awful	26-30	Celebrate! You have a great neighbourhood for walking.
2=many problems	21-25	Celebrate a little. Your neighbourhood is pretty good.
3=some problems	16-20	Okay, but it needs work.
4=good	11-15	It needs lots of work.
5=very good	5-10	It's a disaster for walking!
6=excellent		

The total rating scores for Aoloau, as well as the individual scores for the 5 items, are summarized in the table below. For the total score, the number of neighborhoods audited (n) is 2. This is followed by the mean total score (8.5), standard deviation (0.7), median (8.5), minimum (8), and maximum (9). According to the mean total score, the neighborhoods surveyed in Aoloau are a disaster for walking and needs a lot of work to encourage community walkability.

Table S.6.1. Community Walking Features

Walking Features	n	mean	sd	med	min	max
<i>Total Walking rating</i>	2	8.5	0.7	8.5	8.0	9.0
Room to walk	2	1.5	0.7	1.5	1.0	2.0
Ease of crossing street (s)	2	1.0	0.0	1.0	1.0	1.0
Ease of following safety rules	2	3.5	0.7	3.5	3.0	4.0
Drivers' behavior	2	1.0	0.0	1.0	1.0	1.0
Pleasantness of walk	2	1.5	0.7	1.5	1.0	2.0

*Walkability survey and rating scale is adapted from The National Center for Safe Routes to School (www.saferoutesinfo.org/sites/default/files/walkabilitychecklist.pdf)

Food Cost Survey (FCS)

The CHL Food Cost Survey (FCS), adapted from the Alaska Food Cost Survey, was conducted in all of the CHL jurisdictions in March 2014. Given the link between childhood obesity and food security, particularly in low-income households, CHL conducted this survey of communities in the CHL jurisdictions. Three stores in Aoloau were assessed to determine the cost and availability of market foods in Aoloau.

The FCS is based on a meal plan, in particular, the USDA Thrifty Food Plan (TFP). The Thrifty Food plan, based on a national survey of dietary habits, is designed to meet the nutritional needs at low cost for a family of four with school age children (USDA, 1999). It assumes that the food items are bought at a store and are prepared at home. This menu is made of foods in 10 categories. The categories include fruits, vegetables, meats, legumes, dairy, egg, fats / oils, grain, sweets / beverages, and spices. Included in the report is the percent of each category towards the Thrifty Food Plan cost. The TFP is also used as the basis for determining food assistance levels provided in programs such as school lunch.

If a particular item was missing in a local area/ jurisdiction, we used the cost of a similar item as a substitute for the item that was on the national menu. However, in some cases, items were unavailable and no obvious substitutes were available.

Portland, Oregon serves as a general indicator of and reference point for the price series in a somewhat comparable mainland/lower 48 cities and its food costs have been collected using the same survey as that was used by CHL. The weekly food cost for a family of four with two adults and two young school- age children in Portland was \$142.37.

It is important to note that the Thrifty food Plan menu was developed based on diets and food availability in the contiguous U.S. Further work is necessary to document local diets and food availability and to examine how they may be incorporated into an adjusted thrifty food menu for use in Aoloau, and its effect on community food costs.

Results for Aoloau

- **Food Cost Survey, Costs of Food at Home (\$) based on the Thrifty Food Plan and USDA adjustments.**

In Aoloau, the following foods had no price information: bagels, gelatin, bananas, hamburger buns, dinner rolls, melon, canned kidney beans, cottage cheese, chili powder, French fries, French or Italian Bread, oregano, chicken bouillon, molasses, paprika, Italian herb seasoning, vanilla, and bottled lemon juice. The weekly food cost for the Thrifty Food Plan menu for a family of four in Aoloau was \$189.71. In the CHL region, the average cost was \$215.18, with a minimum of \$173.97 and a maximum of \$286.30. The cost in Portland, USA was \$142.37. Aoloau’s costs for the same or comparable food items of the Thrifty Food Plan are 133.2% of their cost in Portland, Ore.

Table 1. Weekly and Monthly Food Cost to Eat According to the U.S. Thrifty Food Plan in Aoloau

Age, Groups	Weekly	Monthly
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INDIVIDUALS		
Child, 6-8 years	\$39.76	\$172.29
Child, 9-11 years	\$47.18	\$204.44
Male, 20-50 years	\$53.71	\$232.75
Female, 20-50 years	\$49.06	\$212.60
FAMILY		
Family of 2, 20-50 years	\$113.07	\$489.98
Family of 4, Couple, 20-50 years and children, 6-8 and 9-11 years	\$189.71	\$822.08

* Ratio used to calculate cost of family of other size and individuals are based on Center for Nutrition and Policy and Promotion (CNPP)'s Official USDA Alaska and Hawaii Thrifty Food Plans at <http://www.cnpp.usda.gov>

- **Thrifty Food Plan, Weekly Food Costs: By Food Category**

Cost and percent of each food category was presented in the following table (Table 2), in the order from most expensive to least expensive.

Table 2. Weekly Thrifty Food Plan Costs for a Family of 4 by Food Category in Aoloau

Food Group	Cost	Percent
Fruit	\$37.42	19.7%
Meat	\$36.10	19.0%
Grain	\$31.96	16.8%
Vegetable	\$27.94	14.7%
Diary	\$23.79	12.5%
Sweets and Beverages	\$13.88	7.3%
Spice	\$6.38	3.4%
Fats and Oils	\$6.11	3.2%
Egg	\$3.22	1.7%
Legume	\$2.91	1.5%

- **Thrifty Food Plan, Weekly Food Costs: Top 10 Most Expensive Foods**

The top 10 most expensive foods in Aoloau were presented in Table 3.

Table 3. Top 10 Most Costly Food Items in Aoloau

Food	Food Group	Price	Percent
Milk, 1% milk fat	Dairy	\$14.56	7.7%
Potatoes, any variety	Vegetable	\$12.74	6.7%
Oranges, any variety (bagged or loose)	Fruit	\$12.19	6.4%
Beef, ground, lean (16 to 23% fat)	Meat	\$11.03	5.8%
Orange juice, frozen concentrate	Fruit	\$10.57	5.6%
Bagels, plain, enriched	Grain	\$7.78	4.1%
Fruit drink, refrigerated, any flavor	Sweet Beverages	\$7.10	3.7%
Milk, whole	Dairy	\$6.87	3.6%
Pork, ground	Meat	\$6.35	3.3%
Noodles, yolk-free, enriched	Grain	\$4.84	2.6%
Total		\$94.03	49.5%

Summary

The CHL food cost survey found the cost of food for a family of four, using the TFP, to be \$189.71 per week which is 33.3% higher than the weekly food cost for a family of four in Portland, Oregon. In comparison to the average CHL region (\$215.98), the weekly food cost in Aoloau was 12.2% lower.

Summary of Prevalence Study



Children's Healthy Living Program

VII. Conclusion / Summary of Prevalence Study

The purpose of this report is to inform the community of the CHL research that was conducted in Aoloau during 2012 and 2013. It is a “snapshot” of the community during this time period. It is hoped that this comprehensive report will help the community in designing programs, allocating resources, and advocating for policies that increase the health and well-being of young children in Aoloau.

Having a greater the selection of fruit and vegetables at Aoloau’s stores and improving walking conditions could serve to better the health and well-being of young children in the community.

14.1% of participants in Aoloau reported that they ran out of money for food “most times” or “always” each month and 85.1% reported they received some type of food assistance. This is a concern as 82.7% of participants household income was <\$20,000 and the weekly cost to feed a family of four on the Thrifty Meal plan is \$189.71.

The CHL team would like to express our gratitude and appreciation to all the children, parents, caregivers, teachers, community members and partners who assisted in the collection of this information. Without the support and participation of the community this report would not exist.

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