



Background: Nutrition for a Changing World (NCW) Project

- The prevalence of obesity is greatest in American children of Hispanic, African American, Native American and Southeast Asian/Pacific Islander descent.
 - Influenced by biological and social contextual issues, including cultural, economic and environmental factors
- Healthcare and public health professionals do not share the same cultural diversity as the populations they serve.
- Cultural competency and knowledge in the fields of nutrition, health and agricultural-related issues is imperative for the next generation of workforce to effectively and positively impact the problem of childhood obesity.
- The NCW project addressed this need by developing an innovative curriculum and experiential training for diverse undergraduate students at CSU Fullerton.

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Demographics are Changing



California Population

2010 Population
37,253,956

Change from 2000
+ 10.0%

Race/Ethnicity	Share of Population	Change from 2000
Whites:	40%	-5%
Blacks:	6%	-1%
Hispanics:	38%	+28%
Asians:	13%	+31%
Native Americans:	0%	-9%
Multiracial:	3%	+7%
Other groups:	1%	+22%

K – 12 Student Population in CA: 50 – 70% Diverse Students

<http://quickfacts.census.gov/qfd/states/06000.html>

Committee on a Leadership Summit to Effect Change in Teaching and Learning, National Research Council. (2009). *Transforming Agricultural Education for a Changing World*. The National Academies Press.

Obesity in California

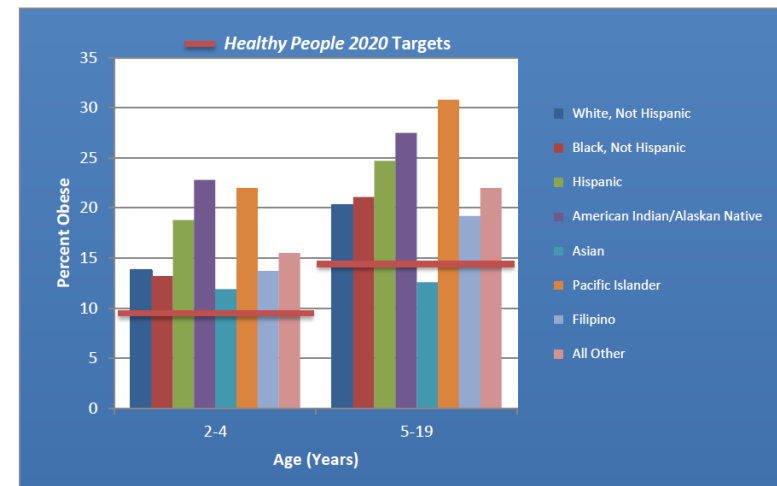


- Obesity remains one of the largest health concerns for youth and adults, leading to increased risk of chronic non-communicable diseases such as diabetes, hypertension, heart disease and others.
- California has one of the largest and fastest-growing immigrant populations of Hispanics, Southeast Asians, Native Hawaiian and other Pacific Islanders in the US. Obesity rates among low-income children in California are highest among these ethnic groups.

Prevalence of Obesity and <i>Healthy People 2020</i> Targets for Californians			
Age	Overweight or Obese (%) ^a	Obese (%) ^b	<i>Healthy People 2020</i> Obesity Targets (%)
Low-Income Children			
2-19 ^c	38.8	21.0	14.5
2-4	33.4	17.3	9.6
5-19	42.1	23.3	N/A
General Population			
12-17 ^d	32.4	15.8	16.1
18+ ^e	62.1	25.4	30.5

Notes: ^a Overweight and obese among children and adolescents is a BMI at the 85th percentile or greater; adult overweight is a body mass index (BMI) of 25 or greater. ^b Obese among children and adolescents is a BMI at the 95th percentile or greater; adult obesity is a BMI of 30 or greater. ^c 2010 Pediatric Nutrition Surveillance System. ^d 2011-12 California Health Interview Survey. ^e 2012 Behavioral Risk Factor Survey. N/A = not available.

Figure 8. Prevalence of Obesity Among Low-Income Children in California by Race/Ethnicity and Age, 2010 PedNSS

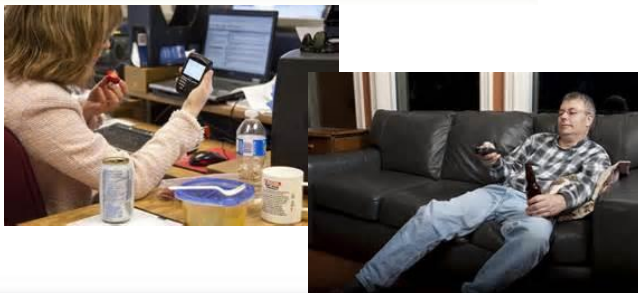
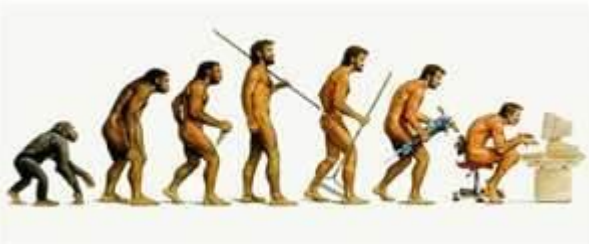


Changes in Diet, Food and Physical Activity

Traditional American Diet



Sedentary Lifestyle



Mexican



Thai



Chinese



Indian



Japanese



The Gap



Rethink your drink presentation !!

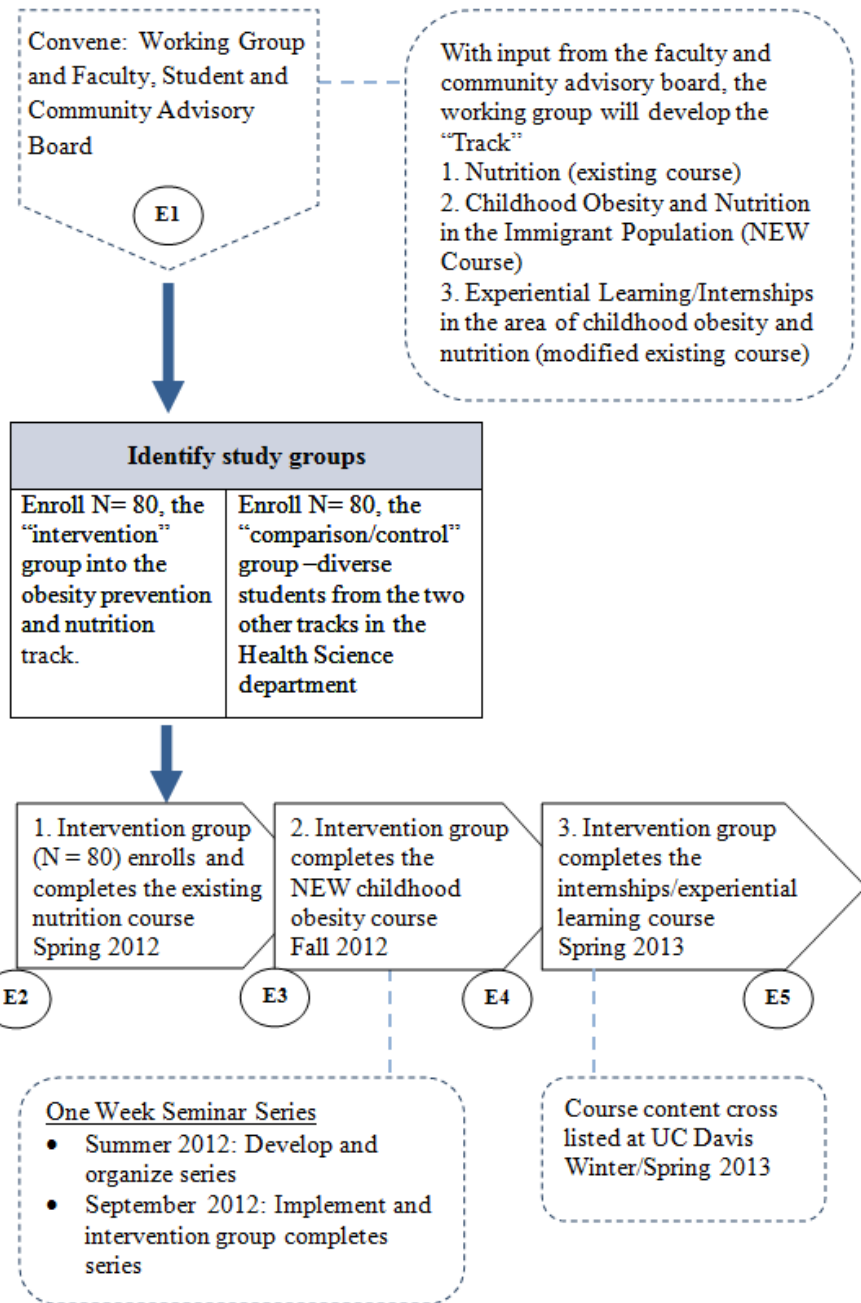


Project Target Objectives

- Educate and train diverse undergraduate students in nutrition/obesity, integrating social contextual concepts
- Develop a Childhood Obesity Prevention and Nutrition curriculum, using a multidisciplinary approach at CSU Fullerton
 - Didactic course with focus on childhood obesity and nutrition in the immigrant population (specifically 1st and 2nd generation Hispanics and Pacific Islanders)
 - Internships and experiential learning course in childhood obesity and nutrition with the community
 - Intensive two-day seminar (topics included: biology of obesity & chronic disease; nutrition during pregnancy & lactation; behavioral & cultural influences on health promotion interventions; scientific literacy and community health; school-based gardens for children's nutrition and health; food insecurity & assistance programs)
- Promote careers and higher education pipeline for diverse students
 - Career information resources; Campus visits and meetings with graduate school diversity officers

Methods

Figure 4: Overview of program



Methods

- **Sample size:** 124 undergraduate students in a quasi-experimental design to assess perceived nutrition knowledge and self-efficacy; self-selected into treatment and comparison groups.
- **Recruitment:** Flyers and informational brochures on CSUF campus.
- **Intervention** over a one year span - coursework, workshops, 120 hour community-based internship, and intensive symposium.
- **Instrumentation:** 82-item questionnaire was distributed to students in both the treatment and comparison groups. Participants had 3 weeks to complete the online survey.
 - The surveys were administered four times over a one year period.
 - The 82-item survey questionnaire yielded seven constructs with good reliability; and question formats used a Likert scale [1) strongly disagree; 2) disagree; 3) neutral; 4) agree; 5) strongly agree], in addition to a mix of multiple choice and free response answers.
- **Statistics:** Independent *t*-tests, multiple linear regression and ANOVA were utilized to assess differences between groups.

Methods: Theoretical Background

Social Ecological Model of Health Promotion

- Social contextual: Macro and micro-influences on health and health disparities.
- Includes familial, demographic, economic, political, legal, organizational, physical environmental, and cultural factors that affect the resources available to individuals throughout their lives.
- At the individual and societal level, issues of acculturation and broader economic and physical environmental influences that may affect, prevent and combat childhood obesity in the immigrant population, are integrated in the curriculum.

- Pasick, R. J., Burke, N. J., Barker, J. C., Joseph, G., Bird, J. A., Otero-Sabogal, R., ... Guerra, C. (2009). Behavioral theory in a diverse society: like a compass on Mars. *Health Education Behavior*, 36(5), 11S-35S.

- Burke, N. J., Joseph, G., Pasick, R. J., & Barker, J. C. (2009). Theorizing social context: rethinking behavioral theory. *Health Education & Behavior*, 36(5), 55S-70S.

Methods: Modules in Didactic Course

Module 1

Physiological and biological aspects of childhood obesity and nutrition across the youth lifespan from early childhood to adolescence

Module 2

Specific issues that influence childhood obesity in Hispanic populations highlighting the social context, culture and psychosocial issues

Module 3

An overview of specific issues influencing Southeast Asians and Pacific Islander childhood obesity highlighting the role of social context

Module 4

A review of effective intervention strategies, including physical activity and nutrition at the community, institutional, school and public policy levels

Methods/Results: Website for Resources

<http://ncw.fullerton.edu/index.htm>

The screenshot shows a web browser window with the URL ncw.fullerton.edu/index.htm. The browser's address bar and tabs are visible at the top. The website's navigation menu includes: Home, About Us, Students, Curriculum, Faculty, Partners, Resources, and Photo Gallery.

The main banner features two globes on the left and the text: **NUTRITION FOR A CHANGING WORLD** and **A Multidisciplinary Approach to Nutrition Education**.

On the left sidebar, there are logos for California State University Fullerton and UC Davis University of California. Below the logos is a "Health - Google News" section with several news snippets:

- FDA approves genetic screening test for cervical cancer - USA TODAY
- Police pile up the pills during drug drop-off - The Trentonian
- FDA Cracks Down on E-Cigs - WDTV
- Walking can help creative thinking, study suggests - CTV News
- Pet Bearded Dragons Carry Rare Form of Salmonella - Nature World News
- Saudi MERS cases surge but experts at loss to explain spike - Sunday Morning

The main content area has a "Welcome to NCW!" heading. The text below reads: "The Nutrition for a Changing World (NCW) program was established in 2011 at California State University, Fullerton (CSUF) in partnership with University of California, Davis to address the growing childhood obesity epidemic. NCW aims to understand and reduce childhood obesity in diverse communities through creating an innovative education curriculum and training underserved diverse students at CSUF to increase workforce diversity in agricultural-related fields."

Below this text is a paragraph: "Childhood obesity is associated not only with immediate health consequences, but also contributes to adult obesity, increases in waist circumference, chronic diseases such as diabetes, cardiovascular disease and cancer, and a reduced quality of life and life expectancy (1-12). At the same time, California's immigrant population has substantially increased over recent decades. Data from the Public Policy Institute of California show that between 1970 and 2006, the number of California residents born abroad increased more than fivefold, from 1.8 million to 9.9 million. This shift in population demographics is significant because national studies show differences in obesity based on immigrant status (13-16)."

To the right of the text is a photo of three women standing outdoors. The caption below reads: "Lyanna Pillazar, Dr. McEligot & Dr. Chandler". Below this is another photo of a group of people indoors.

At the bottom of the browser window, the Windows taskbar is visible with icons for Internet Explorer, File Explorer, Google Chrome, and other applications. The system tray shows the date and time: 6:26 PM, 4/26/2014.

Results - Table 1: Study Population Characteristics

Table 1 *Demographic* (N = 124)

Characteristics	Intervention (n=67)			Control (n=57)		
	N	Percent	Mean	N	Percent	Mean
Total units	66	--	87.92	57	--	78.66
Health Science units	66	--	24.94	57	--	17.47
GPA	67	--	2.96	57	--	2.99
Age	67	--	22.63	54	--	21.09
Financial Aid Eligibility						
Yes	45	67.2%	--	38	66.7%	--
No	21	31.3%	--	19	33.3%	--
Gender						
Female	55	82.1%	--	45	78.8%	--
Male	12	17.9%	--	12	21.9%	--
Ethnicity						
American Indian	0	0.0%	--	0	0.0%	--
Asian	20	29.9%	--	18	31.6%	--
Black	2	3.0%	--	3	5.3%	--
Latino/a	19	28.4%	--	17	29.8%	--
Pacific Islander	0	0.0%	--	0	2.5%	--
White	11	16.4%	--	14	24.6%	--
Multiethnic	11	16.4%	--	4	7.0%	--
Other	4	6.0%	--	1	1.8%	--
Total	67	--	--	57	--	--

Figure 1: Mean Health Construct Scores Across Study Time Periods

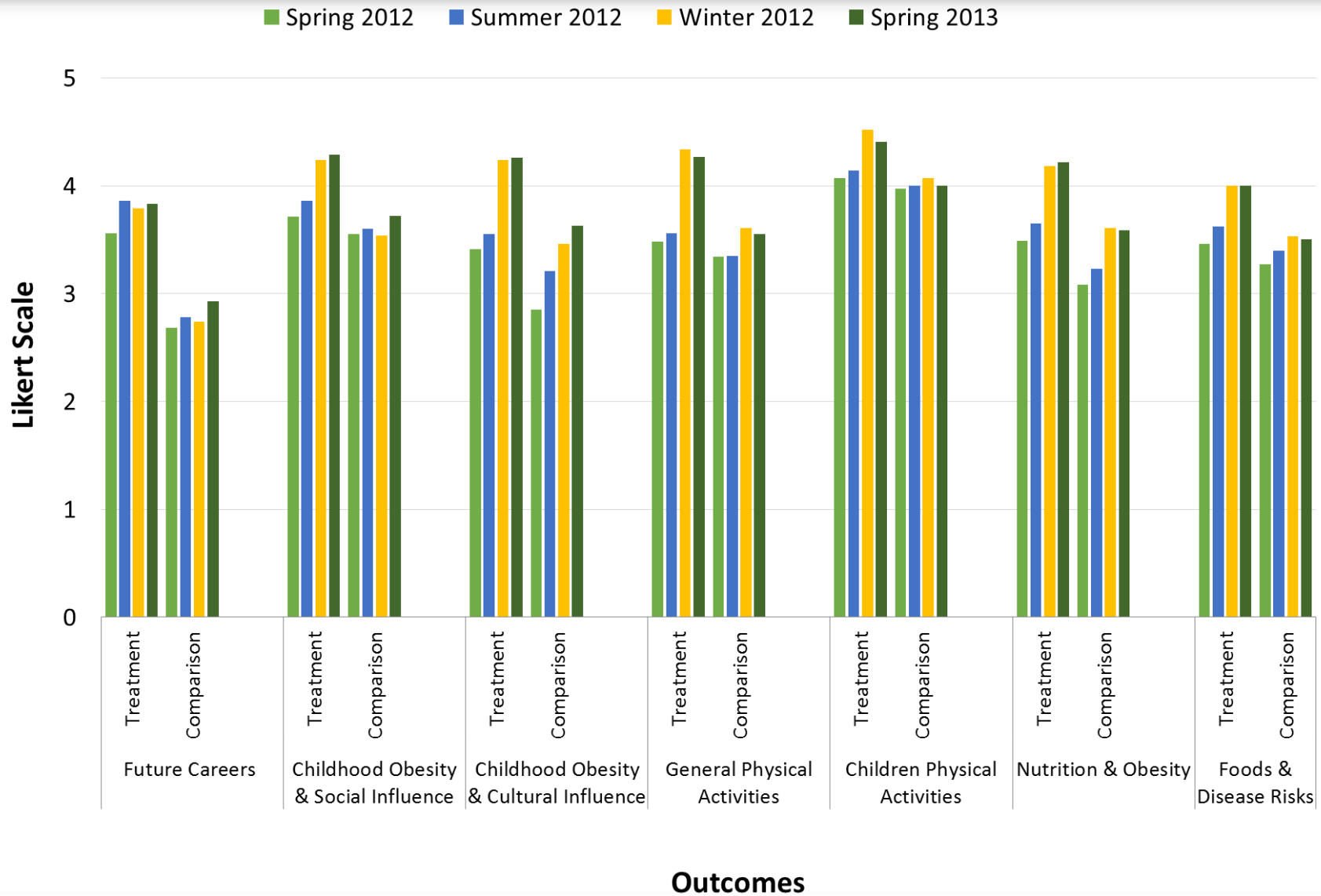


Table 2: Intervention Effects on Health Constructs

Table: Association between intervention & construct scores across baseline to follow-up Adjusted for Baseline Scores, GPA, Gender, Financial Aid, and Units Completed in HESC (P2 n=114, P3 n=74)

Construct	Std. Error	β Standardized	R	R ²	Sig.
Future Careers in Health Science					
9 Months	0.157	0.380	0.652	0.425	<.001
14 Months	0.234	0.296	0.610	0.372	.016
Childhood Obesity and Social Influence					
9 Months	0.090	0.456	0.707	0.500	<.001
14 Months	0.154	0.466	0.533	0.285	<.001
Childhood Obesity and Cultural Influence					
9 Months	0.114	0.446	0.679	0.461	<.001
14 Months	0.171	0.332	0.537	0.288	.011
General Physical Activities					
9 Months	0.105	0.474	0.665	0.442	<.001
14 Months	0.164	0.520	0.551	0.303	<.001
Children Physical Activities					
9 Months	0.100	0.564	0.521	0.271	<.001
14 Months	0.143	0.415	0.428	0.183	.001
Nutrition and Obesity					
9 Months	0.107	0.379	0.612	0.375	<.001
14 Months	0.173	0.395	0.556	0.309	.003
Foods and Disease Risks					
9 Months	0.188	0.872	0.558	0.312	<.001
14 Months	0.222	0.906	0.587	0.345	<.001

$$Y_{\text{outcome}} = \beta_0 + \beta_1 \text{GPA} + \beta_2 \text{Health Science Units} + \beta_3 \text{Financial Aid} + \beta_4 \text{Gender} + \beta_5 \text{Program} + \varepsilon$$

Table 4: Interest in pursuing nutrition and cultural factors

	Asian Pacific Islander	Latino	White	<i>p-value</i>
Total mean of future interest in nutrition and childhood obesity	Mean 3.08	Mean 3.2	Mean 2.9	0.19
Planning on future career involving nutrition	3.21	3.3	3.34	0.8
Interest in pursuing a career in a nutrition-related field	3.26	3.34	3.14	0.64
Interest in a job that involves childhood obesity	3.13	3.38	2.86	0.03 *
Interest in a job that involves childhood obesity and cultural factors influencing it	3.14	3.34	2.80	0.02 *

Conclusion

- We demonstrated that it is feasible to attract and enroll diverse, underrepresented students into a nutrition and childhood obesity curricula, and that through a targeted education program, students improved knowledge and perceived knowledge in various content areas.
- The Intervention group increased their perceived knowledge in the following constructs when compared with the control group: childhood obesity and social/cultural influence, general physical activity, children's physical activity, nutrition and obesity and foods and disease risk. Importantly, students in the intervention group had increased interest in pursuing future careers in nutrition-related fields.
- Those who reported *higher knowledge of cultural influence on childhood obesity* were **more** likely to have interest in pursuing careers in nutrition. This appears to be an important determinant of career interest particularly in diverse students (Latino/a and Asian Pacific Islander).
- The positive results from this intervention project have led to a sustainable presence of nutrition efforts in CSU Fullerton Department of Health Sciences
 - New nutrition course is continuing to be offered, a second course planned
 - One new faculty in nutrition was hired, a second is being considered
 - Additional grant funding for community interventions has been obtained
 - Students from first cohort are moving on to graduate studies (MPH, etc.)

These findings have important implications for developing robust education programs for diverse future nutrition and health educators, and public health professionals

Partners and Collaborators

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Partners (> 20)

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Orange County Asian and Pacific Islander

Community Alliance

Latino Health Access, Alejandro Espinoza

Boys and Girls Club



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Thank You!

Questions?

