Factors Associated with Obesity in Children and Adolescents in California

Sherri Rose, Denise Herd, May Wang

School of Public Health

University of California, Berkeley

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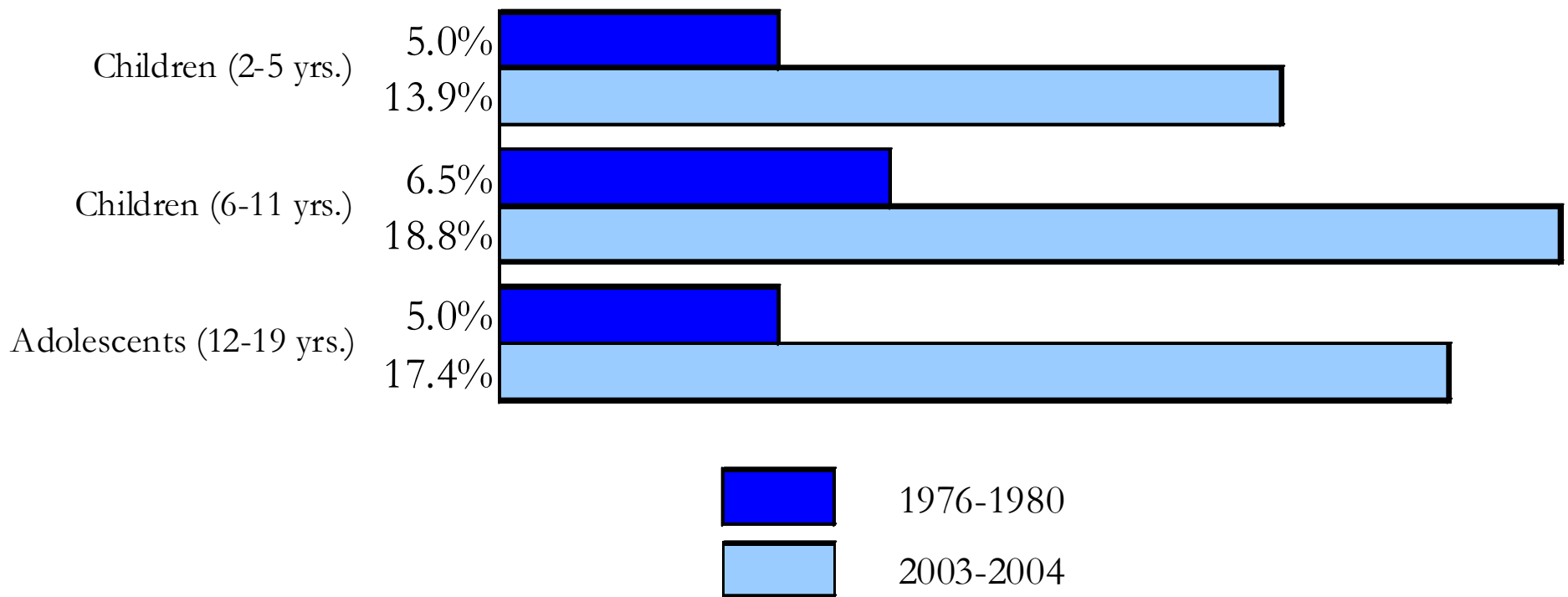San Jose, CA

Obesity in Asian American Youth: Outline

I. Overview: Youth obesity in the United States

II. Objectives

III. United States vs. California

IV. Assessing youth obesity in California: The California Health Interview Survey (CHIS)

V. Methods

VI. Results

VII. Discussion

I. Youth Obesity in the United States

- Youth obesity is increasing in the United States.

Category	1976-1980	2003-2004
Children (2-5 yrs.)	5.0%	13.9%
Children (6-11 yrs.)	6.5%	18.8%
Adolescents (12-19 yrs.)	5.0%	17.4%

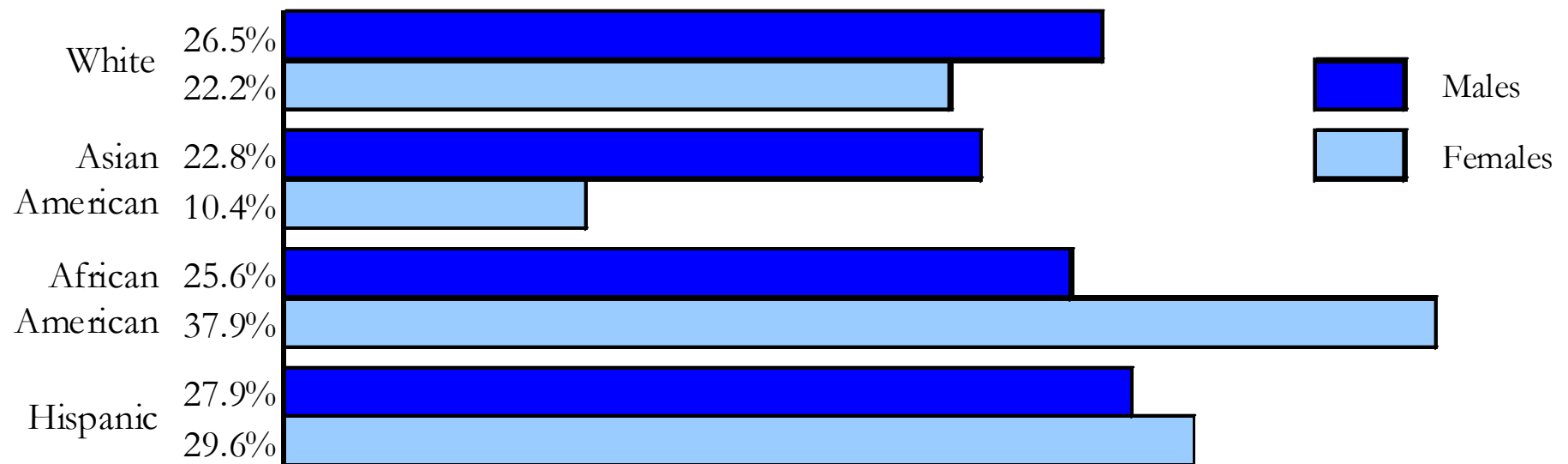Source: National Health and Nutrition Examination Surveys 1976-1980 and 2003-2004.

I. Youth Obesity in the United States

- Prevalence rates of obesity are troubling for all racial and ethnic groups.

Data for adolescents aged 13-20 years.

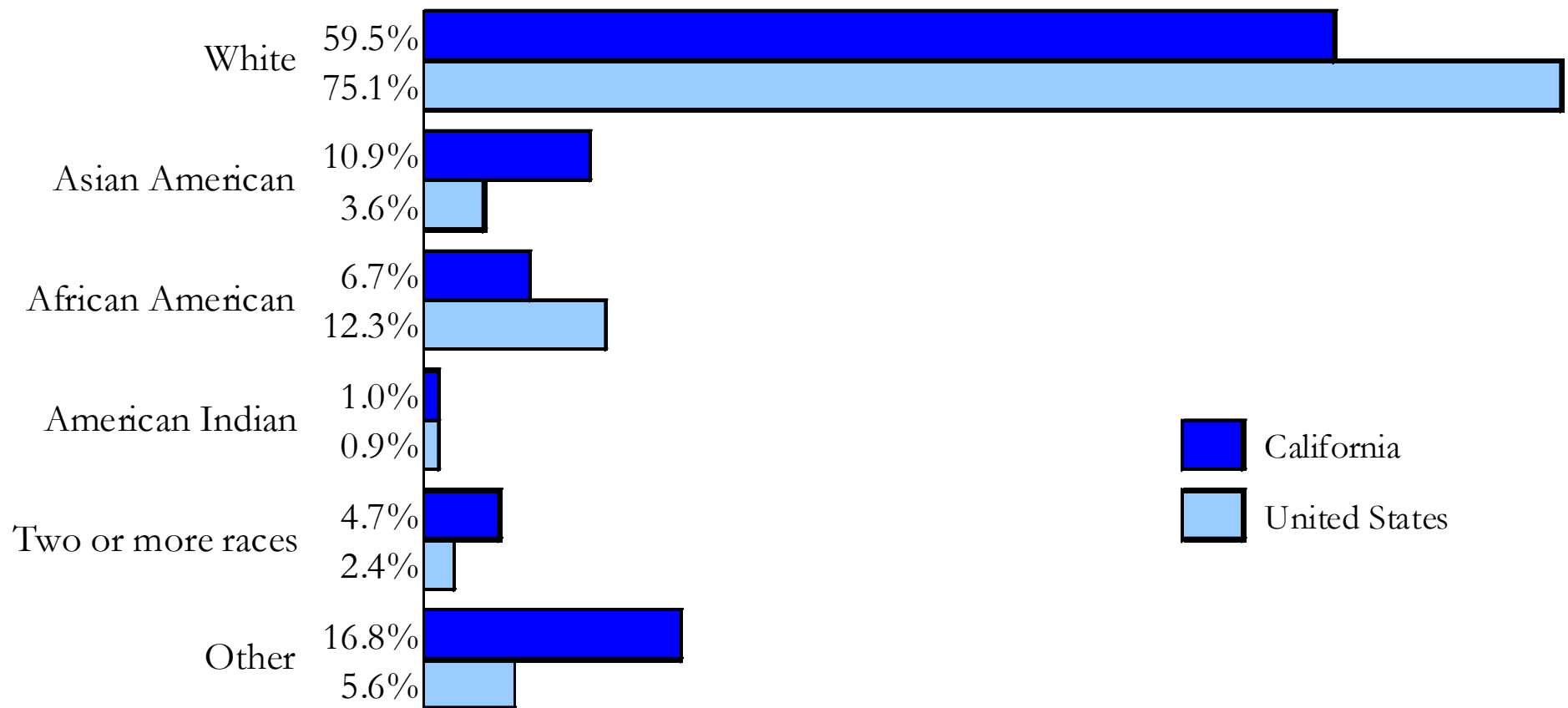Source: National Longitudinal Study of Adolescent Health, Gordon-Larsen (2003).

II. Objectives

- **Analyses were designed to assess obesity prevalence** and **highlight factors associated with obesity** (BMI ≥ 95th percentile with respect to age and gender).

- Study **children** (4-11 yrs.) and **adolescents** (12-17 yrs.) living in California.

- Of specific interest were the **roles of socio-economic factors and race in obesity**.

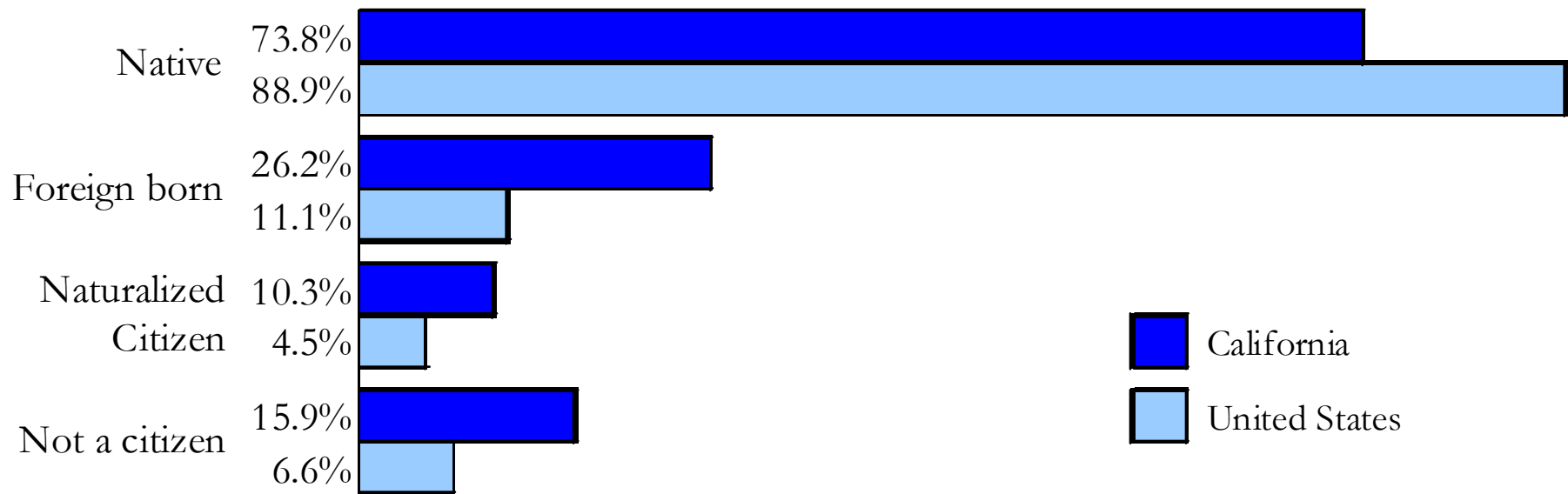# III. United States vs. California: Race

White
59.5%
75.1%

Asian American
10.9%
3.6%

African American
6.7%
12.3%

American Indian
1.0%
0.9%

Two or more races
4.7%
2.4%

Other
16.8%
5.6%

California

United States

Source: Census Bureau, 2000.

III. United States vs. California: Birthplace

	California	United States
Native	73.8%	88.9%
Foreign born	26.2%	11.1%
Naturalized Citizen	10.3%	4.5%
Not a citizen	15.9%	6.6%

Source: Census Bureau, 2000.

III. United States vs. California: Language

English only
60.5%
82.1%

Spanish
25.8%
10.7%

Other Language
13.7%
7.2%

California

United States
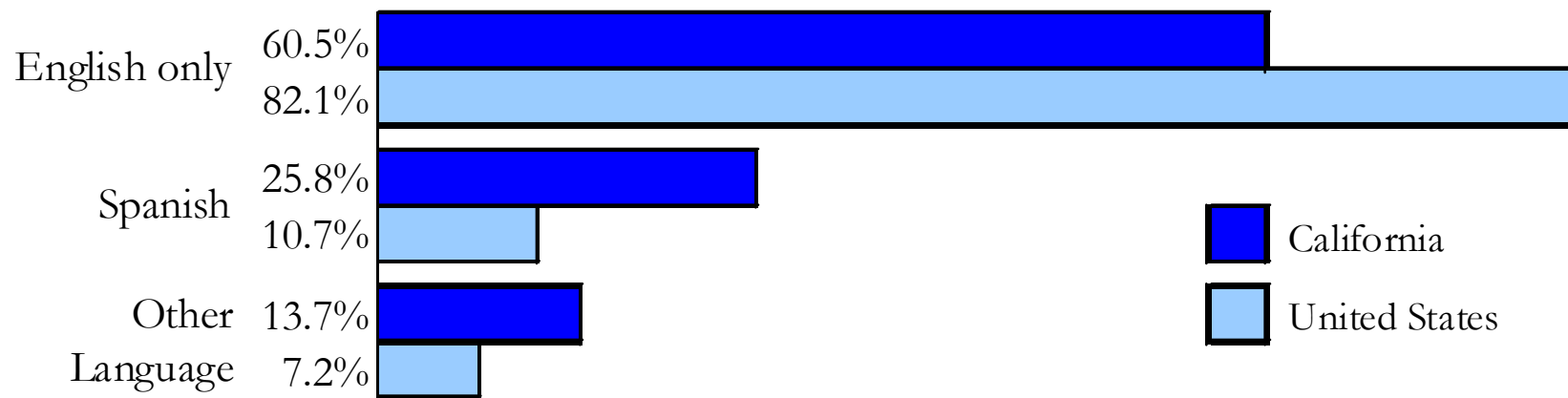
Source: Census Bureau, 2000.

Assessing Youth Obesity in California:
The California Health Interview Survey (CHIS)

IV. The California Health Interview Survey

- The **California Health Interview Survey (CHIS)** is the **largest statewide health survey** conducted in the United States.

- **Designed to assess** health status, chronic conditions, **nutrition**, access to health care, and other public health concerns.

- Started in 2001, CHIS is conducted every two years using random-digit dial methodology.

IV. The California Health Interview Survey

- **CHIS 2001 surveyed** 56,270 adults, **5,858 adolescents**, and **12,802 children** between November 2000 and October 2001.

- **Response rate was 37.7%,** which is comparable to other surveys using random-digit dial methodology, although is hardly ideal.

IV. The California Health Interview Survey

- **Administered in five languages:** English, Spanish, Chinese (including both Mandarin and Catonese dialects), Vietnamese, and Korean.

- For **children** (4-11 yrs.) all data were based on parental report.

- For **adolescents** (12-17 yrs.) all data were based on self-report, except parental education, family income, and geographic living area, which were based on parental report.

V. Methods

- Statistical analyses of CHIS 2001 data (n=5705 children, n=4860 adolescents) were performed in STATA 9.2.

- Due to the way the CHIS survey was designed and conducted, **weighting measures must be applied** as well as the **jackknife resampling procedure** when analyzing the CHIS data. **These procedures are implemented to eliminate biases** (selection, non-response, familial relation, etc) and calculate appropriate standard errors.

V. Methods

- **Analyses were limited** to those individuals who were identified as **African American, Latino, Asian American**, or **White** according to UCLA's Center for Health Policy Research definition.

- **Asian American** classification **did <u>not</u> include Pacific Islanders** or those identifying as multiple races/ethnicities.

- Obesity risk factors were analyzed using logistic regression.

V. Methods

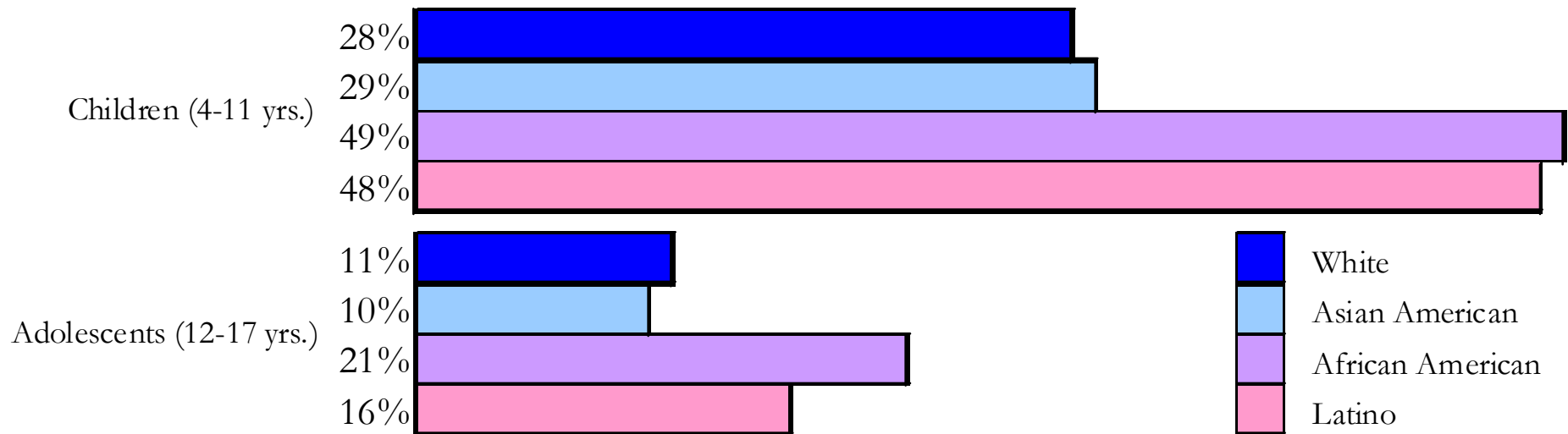- *Outcome Variables.* BMI was calculated based on reported weight and height (kg/m^2). **Children and adolescents at or above the 95th percentile for BMI with respect to their gender and age were considered obese.**

- *Covariates.* Each model included indicator variables for age; gender; ethnicity; citizenship; geography; fruit and vegetable, milk, soda, and juice consumption; TV watching and video game playing; computer usage; and parental education and income effects by race.

VI. Results: Prevalence

- Obesity prevalence rates among all groups are high.

- African American and Latino youths had extreme rates.

Prevalence of Obesity among Youths by Race and Ethnicity
California Health Interview Survey, 2001

Children (4-11 yrs.)	28% / 29% / 49% / 48%
Adolescents (12-17 yrs.)	11% / 10% / 21% / 16%

Legend:
- White
- Asian American
- African American
- Latino

VI. Results: Summary Statistics - Children

Summary Statistics Among Children Aged 4-11 from CHIS, 2001
n=5705

		Mean[a]	Jackknife SE	95% CI
BMI		19.58	0.118	(19.35, 19.82)
Age (years)		7.80	0.03	(7.74, 7.86)
Male[b]		0.51	0.006	(0.50, 0.52)
Race[b]				
	White	0.55	0.008	(0.53, 0.57)
	Asian	0.11	0.004	(0.11, 0.12)
	African American	0.09	0.005	(0.08, 0.10)
	Latino	0.24	0.008	(0.23, 0.26)
Income[b]				
	0-199% FPL	0.32	0.01	(0.30, 0.34)
	200-299% FPL	0.17	0.007	(0.15, 0.18)
	> or = to 300% FPL	0.51	0.008	(0.49, 0.53)

[a] means for categorical and indicator variables are denoted as percents.

[b] categorical or indicator variable. Indicator variables were created for all categorical variables.

VI. Results: Summary Statistics - Children

Summary Statistics Among Children Aged 4-11 from CHIS, 2001
n=5705

		Mean[a]	Jackknife SE	95% CI
Parental Education[b]				
	< HS grad	0.37	0.009	(0.35, 0.39)
	HS grad	0.29	0.008	(0.27, 0.30)
	> HS grad	0.34	0.009	(0.32, 0.36)
US born[b]		0.96	0.004	(0.95, 0.97)
Metropolitan[b]		0.97	0.001	(0.96, 0.97)

[a] means for categorical and indicator variables are denoted as percents.

[b] categorical or indicator variable. Indicator variables were created for all categorical variables.

VI. Results: Summary Statistics - Children

Summary Statistics Among Children Aged 4-11 from CHIS, 2001
n=5705

	Mean[a]	Jackknife SE	95% CI
5 servings of F&V per day[b]	0.44	0.01	(0.42, 0.46)
# of milk servings per day	1.71	0.02	(1.67, 1.75)
# of soda servings per day	0.50	0.015	(0.47, 0.53)
# of juice servings per day	1.19	0.021	(1.15, 1.23)
Hours per day watching TV or playing video games	2.16	0.026	(2.11, 2.21)
Hours per day using a computer for fun	0.74	0.017	(0.71, 0.77)

[a] means for categorical and indicator variables are denoted as percents.

[b] categorical or indicator variable. Indicator variables were created for all categorical variables.

VI. Results: Summary Statistics - Adolescents

Summary Statistics Among Adolescents Aged 12-17 from CHIS, 2001
n=4860

		Mean[a]	Jackknife SE	95% CI
BMI		22.16	0.086	(21.98, 22.32)
Age (years)		14.60	0.023	(14.55, 14.64)
Male[b]		0.51	0.005	(0.51, 0.52)
Race[b]				
	White	0.50	0.006	(0.49, 0.51)
	Asian	0.12	0.003	(0.12, 0.13)
	African American	0.09	0.003	(0.09, 0.10)
	Latino	0.28	0.007	(0.27, 0.30)
Income[b]				
	0-199% FPL	0.37	0.01	(0.35, 0.39)
	200-299% FPL	0.15	0.008	(0.14, 0.17)
	> or = to 300% FPL	0.47	0.009	(0.46, 0.49)

[a] means for categorical and indicator variables are denoted as percents.

[b] categorical or indicator variable. Indicator variables were created for all categorical variables.

VI. Results: Summary Statistics - Adolescents

Summary Statistics Among Adolescents Aged 12-17 from CHIS, 2001
n=4860

		Mean[a]	Jackknife SE	95% CI
Parental Education[b]				
	< HS grad	0.42	0.009	(0.40, 0.44)
	HS grad	0.28	0.009	(0.27, 0.30)
	> HS grad	0.30	0.008	(0.28, 0.32)
US born[b]		0.88	0.007	(0.86, 0.89)
Metropolitan[b]		0.96	0.001	(0.96, 0.96)

[a] means for categorical and indicator variables are denoted as percents.

[b] categorical or indicator variable. Indicator variables were created for all categorical variables.

VI. Results: Summary Statistics - Adolescents

Summary Statistics Among Adolescents Aged 12-17 from CHIS, 2001
n=4860

	Mean [a]	Jackknife SE	95% CI
5 servings of F&V per day [b]	0.40	0.01	(0.38, 0.42)
# of milk servings per day	1.44	0.026	(1.39, 1.50)
# of soda servings per day	1.14	0.022	(1.10, 1.18)
# of juice servings per day	1.00	0.023	(0.95, 1.04)
Hours per day watching TV or playing video games	2.82	0.037	(2.74, 2.89)
Hours per day using a computer for fun	1.33	0.028	(1.27, 1.38)

[a] means for categorical and indicator variables are denoted as percents.

[b] categorical or indicator variable. Indicator variables were created for all categorical variables.

VI. Results: Risk Factors - Children

Children

Factors Associated with increased obesity risk

1) Male gender
2) Soda consumption (servings per day)
3) Watching TV/playing video games (hr/day)
4) African American race
5) Latino ethnicity

VI. Results: Risk Factors - Children

Selected Logistic Regression Odds Ratios for Obesity Risk Factors
Among Children Aged 4-11 from CHIS, 2001

n=5705

	OR	P	95% CI
Age (years)	0.85	< 0.01	(0.82, 0.88)
Male	1.38	< 0.01	(1.14, 1.67)
# of soda servings per day	1.19	< 0.01	(1.07, 1.33)
Hours per day watching TV or playing video games	1.08	0.04	(1.00, 1.16)
Race			
Asian American	0.49	0.06	(0.24, 1.01)
African American	2.87	< 0.01	(1.56, 5.28)
Latino	1.98	< 0.01	(1.31, 2.99)

Note: White was used as baseline for race.

Other variables in the model: citizenship, urban or rural, fruit and vegetable consumption, milk consumption, juice consumption, computer usage, and parental education and income effects by race.

VI. Results: Risk Factors - Children

Children

- Interaction effects with socioeconomic status

  - Among **African Americans** and **Latinos, children whose parents had more education had lower risk of obesity** (OR: 0.42 and 0.45, respectively) than other children than children whose parents had less education.

  - **Higher family income among Whites was associated with having a decreased likelihood of obesity** (OR: 0.59) compared to other whites with lower income.

VI. Results: Risk Factors - Adolescents

Adolescents

- Factors Associated with increased obesity risk

    1) Male gender
    2) Hours per day watching TV or playing
       video games

- Factors Associated with decreased obesity risk
    1) Asian American race

VI. Results: Risk Factors - Adolescents

Selected Logistic Regression Odds Ratios for Obesity Risk Factors
Among Adolescents Aged 12-17 from CHIS, 2001
n=4860

	OR	P	95% CI
Male	2.14	< 0.01	(1.64, 2.80)
Hours per day watching TV or playing video games	1.09	0.01	(1.02, 1.16)
Race			
Asian American	0.18	< 0.01	(0.07, 0.48)
African American	1.08	0.86	(0.45, 2.58)
Latino	0.88	0.59	(0.54, 1.43)

Note: White was used as baseline for race.

Other variables in the model: age, citizenship, urban or rural, fruit and vegetable consumption, milk consumption, soda consumption, juice consumption, computer usage, parental education and income effects by race.

VI. Results: Risk Factors - Adolescents

Adolescents

- Interaction effects with socioeconomic status

  - **Asian Americans whose parents had higher income** (≥ 300% federal poverty level) **had higher risk of obesity (OR: 5.81)** than Asian American adolescents whose parents had lower income.

  - **Higher parental education** (> high school graduate) **among Whites was associated with having a decreased likelihood of obesity** (OR: 0.49).

VI. Results: Factors Associated with BMI

- In other analyses of risk factors for increased BMI, **Asian American children with higher family income were shown to have higher BMI than Asian American children with lower family income**. Results for adolescents were not significant ($P = 0.070$) but followed the same trend.

VI. Results: Limitations of Analyses

- Results depend on variables included in the models. Some risk factors were not available for inclusion, most namely physical activity measures.

- No accuracy assessment of parental and self-reported data among children and adolescents. Most likely to underestimate obesity, which may bias factors associated with obesity.

- Low number of jackknife replications.

- Low response rate.

VII. Discussion

- Results highlighting the high levels of obesity among children were surprising.

  - Overall obesity prevalence rate among children: 35%.

- Results for obesity prevalence among adolescents were less surprising.

  - Overall obesity prevalence rate among adolescents: 13%.

VII. Discussion

- Results highlighting **soda consumption and hours per day watching TV or playing video games** as risk factors for obesity were not surprising.

- Socioeconomic is an important predictor but unexpected results among **Asian Americans**

  - **Adolescents** in families with **higher income had higher risk of obesity**.

VII. Discussion:

- Whites, African Americans, and Latinos may view junk food as cheap food, while **Asian Americans, especially immigrants, may consider such foods luxuries and associated with social status**.

VII. Discussion: Other Studies

- Harrison et al. (2005) found that **among Asian Americans in California**, parents struggled between **maintaining traditional Asian diets and adopting Americanized diets**, often giving in to children's desire to eat heavily marketed but less healthy foods. These Asian American parents found **fast food easily available, low in cost, and efficient** when both parents work long hours.

VII. Discussion: Other Studies

- Fernald (2007) found a similar result among Mexican adults such that **as economic resources increased**, Mexican adults **consumed more high-calorie beverages**, contributing to their weight gain.

VII. Discussion: Other Studies

- Recent meta-analysis (Y. Wang and Beydoun, 2007) of 16 years of literature showed **no consistent association between SES and race in obesity among adolescents** in the United States, and they **were not able to examine Asian Americans** due to lack of data.

VII. Discussion: Next steps

- Analyze CHIS 2003 and 2005 data to confirm findings and examine trends.

- Important for interventions to address soda consumption and sedentary behavior.

- Further studies to explore the impact of socioeconomic factors in Asian Americans.

  - Role of immigration status & time spent living in United States.

  - Impact of urban living.

More information on the
California Health Interview Survey:

http://chis.ucla.edu