



Stemming the Tide: Rising Diabetes Prevalence and Ethnic Subgroup Variation among Asians in Los Angeles County

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BACKGROUND

- Diabetes is a well-recognized global public health crisis.
- Asians are the fastest growing race in the United States,¹ and like other racial/ethnic groups, have been experiencing an increase in diabetes rates.² However, this increase in diabetes rates among Asian Americans may be under-recognized.
- Few diabetes prevalence estimates focusing on Asians and Asian subgroups in the U.S. have been published.

OBJECTIVES

- To examine the prevalence of diabetes among Asians and Asian subgroups in Los Angeles County, which has the largest county population of Asians in the United States.
- To examine factors associated with diabetes among Asians overall.

METHODS

- Data were analyzed from 6 cycles of the Los Angeles County Health Survey (n= 47,282), from 1997 to 2011. Respondents in each household were randomly selected using an unrestricted random digit dial (RDD) sampling methodology, which included all eligible LA County households with landline telephones.
- Interviews were conducted in English, Spanish, Mandarin, Cantonese, Korean, and Vietnamese, with one adult randomly selected from each household.
- Asian adults (n=4,672) were categorized into the following ethnic subgroups: Chinese (n=1,693), Filipino (n=737), Korean (n=786), Japanese (n=558), Vietnamese (n=313), South Asian (n=269), and Other Asian (n=316).
- Descriptive analyses and multivariable logistic regression were conducted to examine trends in diabetes prevalence, prevalence among Asian subgroups, and factors associated with diabetes. A significance level of $\alpha=0.05$ was used.
- Individuals were classified as having diabetes if they gave a positive response to the following question: "Have you ever been told by a doctor or other health professional that you have diabetes or sugar diabetes?"
- Covariates: age group, gender, education, household income, nativity, years living in the U.S., smoking status, alcohol use, insurance status, leisure-time physical activity, and weight status.
- For Asians, weight status was defined using a) standard BMI cutoffs recommended by CDC and WHO (BMI<25, 25≤BMI<30, BMI≥30 kg/m²), and b) Asian-specific BMI cutoffs (BMI<23, 23≤BMI<27.5, BMI≥27.5 kg/m²) recommended by WHO Expert Consultation.³
- All analyses were conducted using Statistical Analysis System version 9.3 (SAS Institute Inc., Cary, NC).

RESULTS

1. Trends in diabetes prevalence and BMI

- The age-adjusted prevalence of diabetes increased from 1997 to 2011 for all major racial/ethnic groups (p<0.005). Among Asians overall, the prevalence of diabetes increased by 66%, from 5.8% in 1997, to 9.6% in 2011.
- The prevalence of diabetes among Asians was lower than that of Latinos and blacks, and was similar to that of whites from 1997 to 2005, after which it appeared to increase more rapidly among Asians compared to whites (Table 1, Figure 1).

Table 1. Trend in Age-Adjusted Diabetes Prevalence^a by Race/Ethnicity, LA County (N=47,282)

Race/Ethnicity	1997 (n=7,840)	1999 (n=8,166)	2002 (n=7,948)	2005 (n=8,364)	2007 (n=7,020)	2011 (n=7,944)
Latino	9.5 (7.9, 11.0)	11.3 (9.6, 13.1)	11.4 (9.8, 13.0)	12.3 (10.8, 13.8)	12.8 (11.4, 14.3)	13.5 (11.8, 15.2)
White	4.6 (3.9, 5.4)	5.5 (4.7, 6.4)	5.4 (4.6, 6.2)	5.6 (4.8, 6.5)	5.7 (5.0, 6.5)	6.7 (5.6, 7.9)
Black	10.1 (8.0, 12.2)	9.5 (7.2, 11.8)	9.4 (7.3, 11.5)	12.0 (9.7, 14.4)	11.4 (8.7, 14.1)	12.4 (9.8, 15.1)
Asian ^b	5.8 (3.8, 7.8)	5.4 (3.4, 7.5)	5.0 (3.2, 6.8)	7.1 (5.3, 9.0)	9.1 (7.1, 11.2)**	9.6 (7.4, 11.8)*

^aTest for trend: p=0.002 for blacks, p<0.001 for Latinos, whites, and Asians.
^bAfter controlling for age, Asian vs. White, *p<0.05, **p<0.001

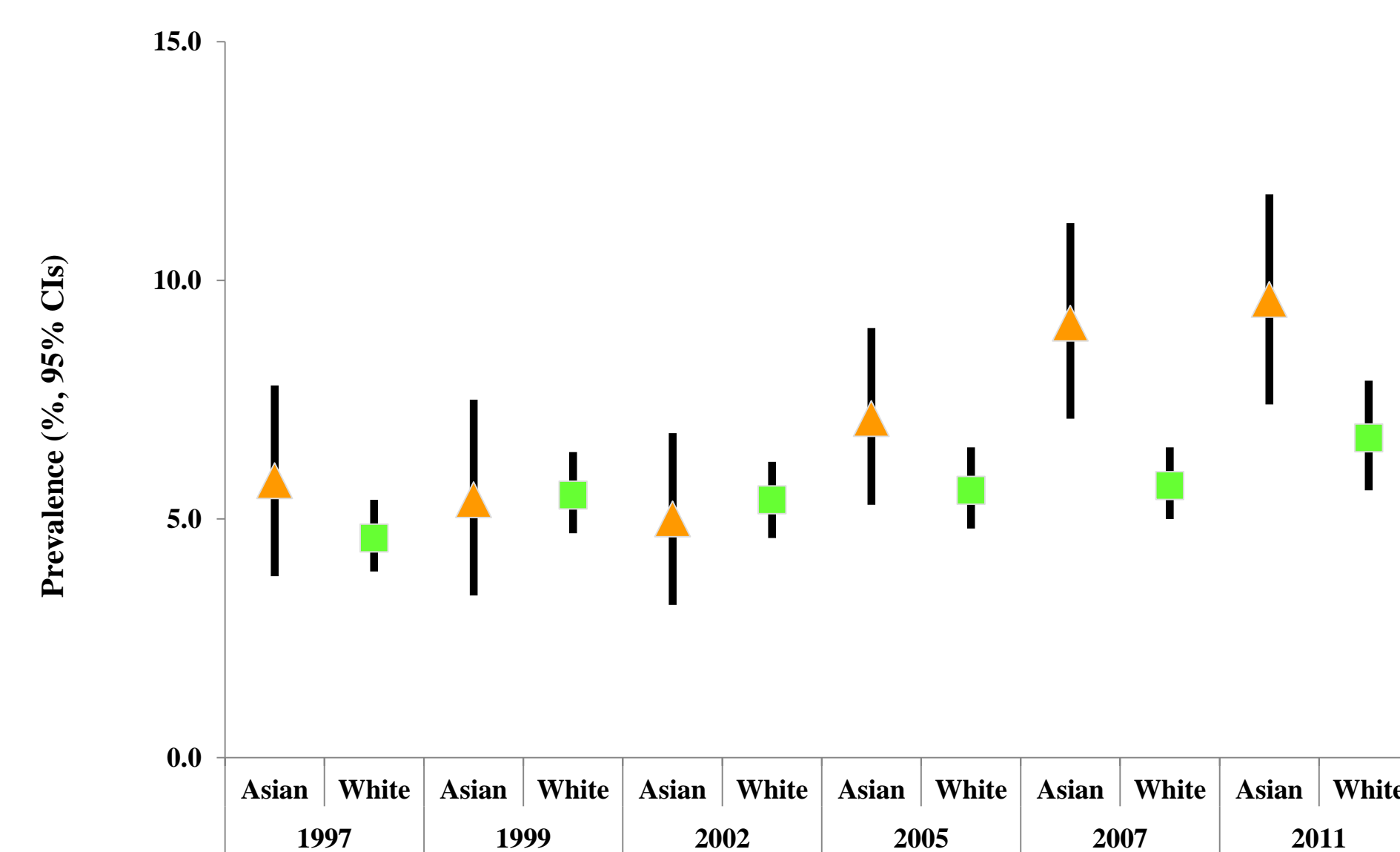


Figure 1. Age-Adjusted Diabetes Prevalence Among Asians vs. Whites, LA County, 1997-2011

- The age-adjusted mean BMI also increased among Asians during this period, but it remained lowest compared to other racial/ethnic groups, and was significantly lower than that of whites (Table 2, Figure 2).

Table 2. Trend in Age-Adjusted Mean BMI by Race/Ethnicity, LA County (N=47,282)

Race/Ethnicity	1997 (n=7,840)	1999 (n=8,166)	2002 (n=7,948)	2005 (n=8,364)	2007 (n=7,020)	2011 (n=7,944)
Latino	26.5 (26.3, 26.7)	27.0 (26.8, 27.2)	27.3 (27.1, 27.5)	27.9 (27.6, 28.1)	27.8 (27.6, 28.1)	28.3 (28.0, 28.5)
White	24.9 (24.7, 25.0)	25.4 (25.2, 25.6)	25.4 (25.2, 25.6)	25.5 (25.2, 25.7)	25.9 (25.6, 26.2)	25.6 (25.3, 25.9)
Black	26.9 (26.6, 27.3)	26.9 (26.5, 27.4)	27.9 (27.5, 28.4)	27.7 (27.2, 28.3)	27.8 (27.2, 28.3)	28.4 (27.8, 28.9)
Asian ^b	22.9 (22.6, 23.2)***	23.3 (22.9, 23.6)***	23.5 (23.1, 23.8)***	23.7 (23.4, 24.0)***	23.9 (23.4, 24.4)***	24.5 (24.1, 24.9)***

^bAfter controlling for age, Asian vs. White, ***p<0.0001

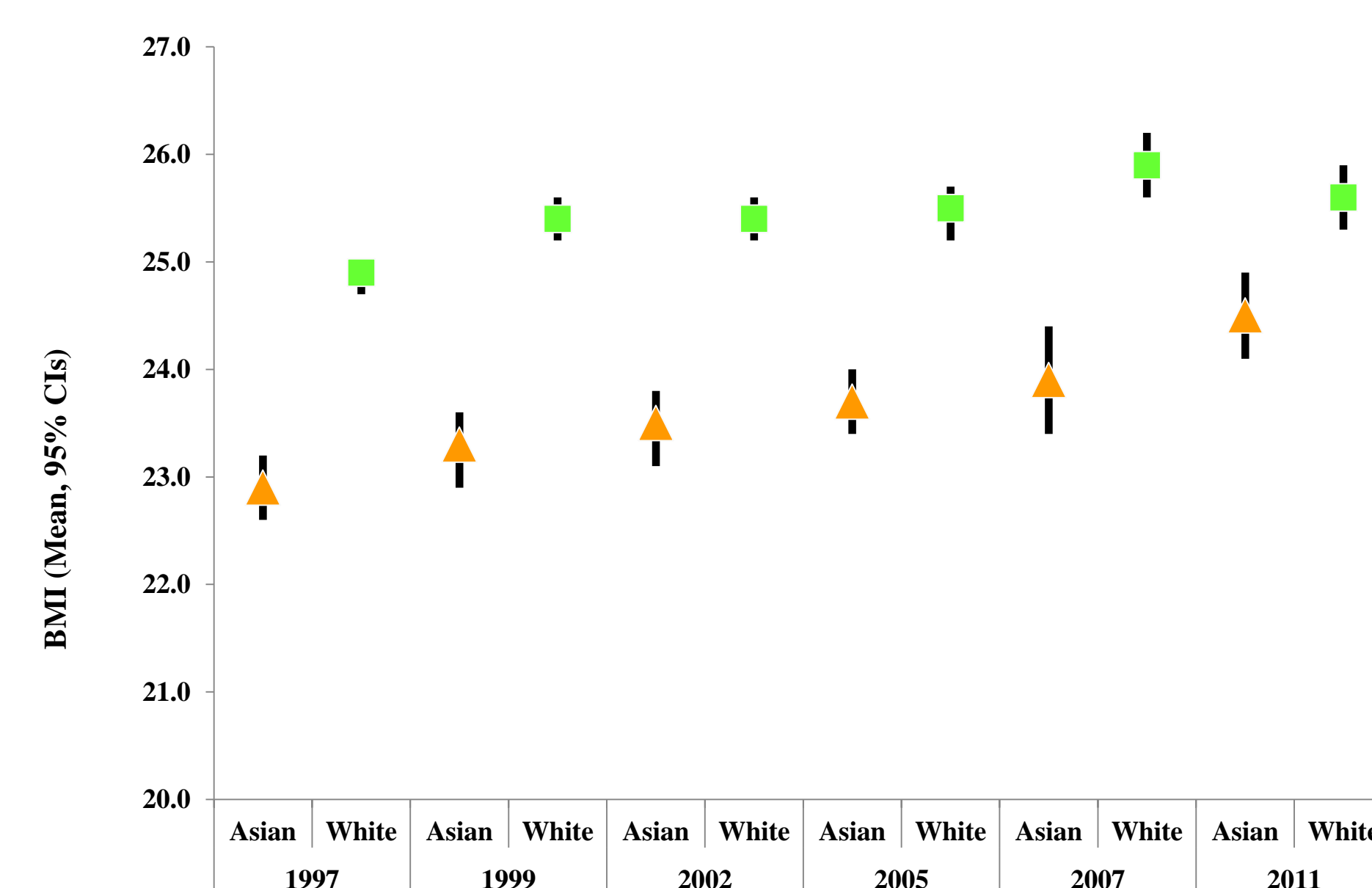


Figure 2. Age-Adjusted Mean BMI Among Asians vs. Whites, LA County, 1997-2011

RESULTS (Continued)

2. Prevalence of diabetes among Asian subgroups

- The age-adjusted diabetes prevalence was highest among Filipinos (10.7%), South Asians (11.8%) and Other Asians (14.3%), and lowest among East Asian ethnicities (Chinese, Vietnamese, Korean, and Japanese) whose rates were comparable to that of whites. A similar pattern was seen in mean BMI among Asian ethnicities (Table 3).
- After adjusting for age, gender, and BMI, Filipino, South Asian, and Other Asian adults were found to be at least twice as likely to report a diagnosis of diabetes as White adults (Table 3).

Table 3. Age-Adjusted Mean BMI, Diabetes Prevalence, and Adjusted Odds Ratios of Diabetes Among Asian Subgroups, LA County, 1997-2011

Race/Ethnicity	Mean BMI (95% CI)	Diabetes Prevalence (%; 95% CI)	Adjusted OR ^b (95% CI)
White	25.4 (25.3, 25.5)	5.7 (5.3, 6.0)	1.00
Asian	23.7 (23.5, 23.8)	7.3 (6.4, 8.1)	--
Chinese	23.0 (22.8, 23.3)	5.2 (4.1, 6.4)	1.03 (0.79, 1.34)
Vietnamese	22.9 (22.3, 23.5)	5.9 (3.0, 8.8) ^a	1.17 (0.65, 2.11)
Korean	23.4 (23.1, 23.7)	6.3 (4.6, 7.9)	1.39 (0.98, 1.97)
Japanese	23.9 (23.6, 24.3)	6.7 (4.8, 8.7)	1.37 (0.96, 1.94)
Filipino	24.5 (24.2, 24.9)	10.7 (7.9, 13.4)	1.98 (1.43, 2.72)
South Asian ^c	25.0 (24.5, 25.5)	11.8 (6.5, 17.1)	1.96 (1.11, 3.49)
Other Asian ^d	25.1 (24.5, 25.8)	14.3 (8.8, 19.8)	2.10 (1.20, 3.70)

^aEstimate has a relative standard error ≥23%.
^bModel included Asian subgroups, age (categorical), gender, BMI (Asian Standard: under-to-normal weight: BMI<23.0 kg/m²; overweight: 23.0≤BMI<27.5 kg/m²; obese: BMI≥27.5 kg/m²), using whites as the reference group.
^cIncludes Asian Indian, Sri Lankan, Pakistani, Bangladeshi.
^dInclude Asians not listed in the other subgroups, including southeast Asians (i.e. persons from Cambodia, Thailand, Laos, etc.) and Asians who did not specify any ethnicity.

3. Factors associated with diabetes among Asians

- Diabetes prevalence among Asians was highest among adults who were aged 65 years or older, living below poverty, foreign-born but living in the U.S. for 10 years or more, non-drinkers, insured, physically inactive, and overweight or obese.
- After adjusting for all covariates: Asians who were older, non-drinkers, insured, and overweight or obese were found to have increased odds of diabetes.
- Asian adults who were 65 years or older were 13 times more likely to report being diagnosed with diabetes compared to those aged 18-49 years.
- Asian adults who were categorized as overweight or obese using Asian-specific BMI cutoffs were, respectively, two times and six times more likely to report being diagnosed with diabetes compared to their normal-to-underweight peers.
- Asian adults who drank alcohol were less likely to be diagnosed with diabetes compared to non-drinkers.

LIMITATIONS

- The data source did not discern whether respondents had type I or II diabetes.
- The data were cross-sectional and cannot be used to infer causation.
- The data were self-reported.

DISCUSSION

- In Los Angeles County, diabetes prevalence appears to be increasing more rapidly among Asians compared to whites despite overall lower BMI.
- However, there is significant heterogeneity in diabetes prevalence among Asian subgroups that is masked by reporting data in aggregated form.
- Factors identified by our study as being associated with diabetes among all Asians after adjusting for all covariates were age ≥ 65 years, being overweight or obese, being a non-drinker, and being insured.
- The rapid increase in diabetes prevalence among Asians residing in Los Angeles County – parallels reports of increasing rates of diabetes reported among Asians living in rapidly urbanizing countries such as China and India.⁴

CONCLUSIONS

- Diabetes is a serious public health problem among Asian Americans that warrants increased attention.
- Diabetes prevalence varies considerably among Asian subgroups and there is a need for reporting disaggregated data.
- More research is needed to develop culturally appropriate interventions for diabetes prevention and control.

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