Reducing exposure to UV radiation from indoor tanning is an important strategy for reducing the burden of skin cancer. The US Preventive Services Task Force recommends counseling fair-skinned individuals ages 10 to 24 years to minimize exposure to UV radiation to reduce skin cancer risk. Appearance-focused interventions, such as self-guided booklets, videos on photoaging, and peer counseling sessions, have been shown to reduce indoor tanning among young adults by up to 35%. Changing the social norms related to tanned skin and attractiveness may also be an effective strategy in reducing indoor tanning.

Other approaches to reducing UV exposure from indoor tanning include the US Food and Drug Administration's proposed reclassification of indoor tanning devices from low- to moderate-risk devices requiring premarket notification and labels designed to warn young people not to use them, the 10% excise tax on indoor tanning services established through the Patient Protection and Affordable Care Act, limiting deceptive advertising claims about indoor tanning, and limiting indoor tanning among minors.

Limitations of this study include its reliance on self-reported data, which are subject to various biases. In addition, the NHIS is generalizable only to the noninstitutionalized civilian adult population, and the YRBS is generalizable only to high school students. Despite these limitations, this study provides nationally representative estimates, allowing for the continued monitoring of indoor tanning and evaluation of efforts aimed at curbing the widespread use of indoor tanning among young women and reducing the burden of skin cancer.

Gery P. Guy Jr, PhD, MPH
Zahava Berkowitz, MSc, MSPH
Meg Watson, MPH
Dawn M. Holman, MPH
Lisa C. Richardson, MD, MPH

Author Affiliations: Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia (Guy, Berkowitz, Watson, Holman, Richardson); now with Division of Blood Disorders, National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention, Atlanta, Georgia (Richardson).

Corresponding Author: Gery P. Guy Jr, PhD, MPH, Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Hwy NE, Atlanta, GA 30341 (irm2@cdc.gov).


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7. Patient Protection and Affordable Care Act, pl 111-148, sec. 10907(b).

The DASH Diet and Diet Costs Among Ethnic and Racial Groups in the United States

The Dietary Approaches to Stop Hypertension (DASH) diet is perhaps the best example of how a nutrient-dense dietary pattern can prevent chronic disease. In randomized trials, DASH dietary patterns lowered blood pressure in hypertensive individuals. Subsequent trials and observational studies have consistently found that DASH-type diets reduced cardiovascular and metabolic risk.

Despite its proven health benefits, the DASH food pattern has not been widely adopted. Its limited uptake might be explained by economic constraints, since food prices influence food choices and constitute a major barrier to dietary change. Nutrient-dense foods, central to DASH, tend to be more costly compared with calorie-dense alternatives.

In the present study, we explored how diets consumed by US adults aligned with DASH guidance. We hypothesized that the DASH accordance of diets would be greater among persons of higher socioeconomic status. We also hypothesized that DASH-accordant diets would be more costly for some ethnic groups but not necessarily for others. Our previous analyses of US adults indicated that Hispanic adults achieved a diet quality similar to non-Hispanic white adults but at lower cost.

Methods | Data for 4744 adults from the 2001-2002 National Health and Nutrition Examination Survey (NHANES) were used for analyses because they allow linkage of dietary data to a contemporaneous, national food price database. The data sources and linkage have been described in detail previously. Methods are provided in greater detail in the eAppendix in the
Supplement. The National Center for Health Statistics has obtained institutional review board approval for all cycles of NHANES studies and the data have been made available for public use. The NHANES data sets meet the University of Washington's criteria for a "public data set," requiring neither institutional review and approval or exemption status.

The independent variable was a DASH adherence score, similar to one previously applied to the Nurses’ Health Study. Our score was based on consumption of 5 encouraged food groups: fruits, vegetables (excluding fried potatoes and chips), nuts and legumes, whole grains, low-fat dairy, and 3 discouraged food and nutrient groups (red and processed meats, added sugars, and sodium). Following an established approach, participants were scored on each of the food and nutrient groups, and the sum of the scores (range, 8–40) represented the relative DASH adherence of each participant’s diet. Quintiles were used for analysis.

Age-adjusted descriptive analyses evaluated the DASH score by sociodemographic strata. Survey-weighted linear regression models to examine diet cost and DASH adjusted for age group, sex, race/ethnicity, education, and family income. An interaction between diet cost and DASH score by race/ethnicity was also explored. Analyses accounted for the complex survey design of NHANES.

Results | Diets consumed by US adults had low DASH adherence scores. The mean DASH score was 20.7, with a range of 8 to 38. DASH scores by demographic strata are provided in eTable 1 in the Supplement. DASH adherence scores were highest among individuals with highest income and educational attainment. Non-Hispanic black adults had the lowest DASH adherence among the 3 predominant race/ethnicity groups.

DASH adherence was positively associated with diet cost. In the Supplement, eTable 2 shows the energy-adjusted diet cost (dollars per 2000 kcal [$/2000 kcal]) by DASH score quintile. Adults in the highest quintile (best accordance) consumed diets with a mean cost that was $0.78 higher (19%) than the cost of diets in the lowest quintile. Moreover, the association between DASH adherence and diet cost appeared to differ by race and ethnicity (P value for interaction, .04). Differences by race/ethnicity are evident in the Figure, which plots the mean (95% confidence interval) energy-adjusted diet cost by quintile of DASH score. For non-Hispanic black and white adults, there were significant differences in diet cost across quintiles of DASH adherence, with the mean cost in the top quintile higher than the bottom quintile by $1.30 (34%) and $0.86 (21%) for black and white adults, respectively. By contrast, among Mexican-American and Hispanic (MAH) adults, the mean diet cost in the top quintile was only $0.26 (6%) higher than the lowest quintile.

Discussion | According to NHANES data, diets consumed by US adults showed low DASH adherence scores, with the lowest scores occurring among disadvantaged groups. Overall, we also observed that diets with higher DASH adherence scores were more costly. Costs may explain why the DASH diet pattern has not been more widely adopted. While the DASH pattern was composed of readily available and palatable foods, food prices were not accounted for. Prices are one determinant of food choice, and affordability of food was a factor of concern for African Americans considering adopting the DASH diet.

It was therefore important to observe that for MAH adults, more DASH-accordant diets were not associated with significantly higher costs. While most observational studies indicate that nutritious diets are more costly, intervention and modeling studies have shown that improvements can be achieved in a cost-neutral fashion. Critical to achieving healthful diets, affordably is the modification of the habitual diet to include foods that are both nutrient dense and relatively low cost. Such foods may feature prominently in the diet patterns of MAH adults and contribute to the findings reported here. A detailed analysis was beyond the scope of the present study, but our preliminary analyses (eTable 3 in the Supplement) indicate that MAH adults achieved both “encouraged” and “discouraged” components of DASH adherence at lower cost compared with other non-Hispanic adults.

In conclusion, the wider promotion of the DASH diet and other evidence-based dietary patterns is integral to popul-
tion-level chronic disease prevention, but economic barriers may exist. While DASH-accordant diets were generally more costly, our results indicate that some ethnic eating patterns may hold a key to making healthful diets economically feasible for all Americans.

Pablo Monsivais, PhD, MPH
Colin D. Rehm, MPH
Adam Drewnowski, PhD

Author Affiliations: School of Public Health, University of Washington, Seattle (Monsivais, Rehm, Drewnowski); United Kingdom Clinical Research Collaboration, Centre for Diet and Activity Research, Cambridge, England (Monsivais); Department of Public Health and Primary Care, University of Cambridge, Cambridge, England (Monsivais).

Corresponding Author: Pablo Monsivais, PhD, MPH, Centre for Diet and Activity Research, Box 296, Institute of Public Health, University of Cambridge, Cambridge CB2 0SR, England (pm49@medschl.cam.ac.uk).


Author Contributions: Study concept and design: Monsivais, Rehm. Acquisition of data: Rehm. Analysis and interpretation of data: All authors. Drafting of the manuscript: Monsivais, Rehm. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Monsivais, Rehm. Obtained funding: All authors. Administrative, technical, or material support: All authors. Study supervision: Monsivais, Drewnowski.

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Invited Commentary
DASH for Less Cash?

It is well established that the Dietary Approaches to Stop Hypertension (DASH) eating plan, which emphasizes increased consumption of fruits, vegetables, and reduced dietary saturated fat, cholesterol, and sodium, improves blood pressure. Intervention studies, for example the Exercise and Nutrition Interventions for Cardiovascular Health (ENCORE) studies, have demonstrated have demonstrated that DASH can be implemented with other lifestyle changes including weight loss and physical activity, which also addresses other ongoing epidemics in our society, including obesity and diabetes. DASH was formally adopted into the Dietary Guidelines for Americans, 2010. Despite recommendations, widespread adoption of long-term adherence to DASH has been limited, particularly among low-income and racial/ethnic minority groups, who are at greatest risk for hypertension and the resulting poor health consequences. In this issue, Monsivais and colleagues highlight the relationship of the DASH eating pattern to food costs using data from the 2001-2002 National Health and Nutrition Examination Survey (NHANES). The authors scored diets reported by 4744 adults based on adherence to DASH and determined estimated retail costs for reported foods per 2000 kilocalories. DASH adherence was positively related to diet cost; specifically, the foods reported by those in the top 20% of adherence to the DASH dietary pattern cost 19% more to obtain than foods reported by those in the lowest DASH adherence category. The mean diet cost for the healthiest quintile was 34% higher for white adults and 21% for black adults, both statistically significantly higher than the cost for the lowest quintile in either race/ethnic group. In marked contrast, Hispanic adults (predominantly Mexican American in this sample) in the top DASH accordance quintile were consuming foods costing only 6% more than the lowest quintile.

The authors conclude that DASH-accordant diets need not necessarily cost more than less healthy diets, given the diets being reported by Hispanics. It is worth delving into the supplemental tables to better comprehend these surprising results. First, it should be noted that, on average, non-Hispanic white and Hispanic adults had similar DASH adherence scores, and both groups had significantly higher concordance scores on non-Hispanic black adults; however, adherence scores were generally low across all 3 groups. Second, the general trend of higher cost for healthier components of DASH (eg, fruits and vegetables, lower-fat dairy products) as well as higher costs for less unhealthy forms of foods avoided (eg, meats) was of a similar magnitude in non-Hispanic white and non-Hispanic black adults. The principal novel finding is that for Hispanic adults, the trend toward more expensive costs for the healthier components of DASH was of a similar magnitude as the other 2 race/ethnic groups (P = .09); however, there was no difference in cost for the components to avoid (−3%; P = .26). Some limita-