Physical Inactivity and Overweight Among Los Angeles County Adults

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Objectives: The present study examines sociodemographic, health status, health behavioral, and health-related self-perception correlates of physical inactivity in a large, multiethnic urban population.

Methods: A random-digit-dialed telephone survey of a representative sample of 8353 Los Angeles County adults aged ≥18 years was conducted between September 17, 1999 and December 31, 2000. Data were analyzed to assess the prevalence and identify independent correlates of physical inactivity, defined as <10 minutes of continuous physical activity weekly ("sedentary").

Results: Overall, the prevalence of sedentary adults was 41%. Lower educational attainment, female gender, advancing age, non–U.S. birthplace, poorer self-perceived health status, self-perceived depression, smoking, leisure-time television watching/computer use, and receiving a diabetes diagnosis were significantly related to sedentariness in both bivariate and multivariate analyses.

Conclusions: Mental and physical health status were prominent correlates of sedentariness. Lower socioeconomic class was also associated with sedentary behavior. Further research is needed to understand the relationship between self-perceived overweight and sedentary behavior.
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Introduction

Obesity has reached epidemic proportions in the United States,[1,2] with the proportion of obese U.S. adults (body mass index [BMI]>30 kg/m^2) rising markedly in less than a decade, from 22.9% in 1988–1994 to 30.5% in 1999–2000.[3] The ranks of the overweight (BMI>25 kg/m^2) include nearly two thirds of all American adults.[3] The obesity epidemic is also having an impact on youth, contributing to a dramatic increase in type 2 diabetes mellitus incidence during the second decade of life,[4] and garnering increasing local and national attention.[5–7] African American and Latino communities compared with white communities are at greater risk for obesity and concomitant eating and physical activity patterns, and bear an increasingly disproportionate chronic disease burden.[1,8]

Regular physical activity decreases the risk of obesity,[9,10] yet nearly 30% of Americans are categorized as sedentary.[11] Indeed, compared to other preventive and therapeutic options, modest increases in regular physical activity can produce a broad spectrum of health benefits at little risk, including improved weight control.[12,13] Physical activity can help to prevent and manage heart disease and is associated with reductions in the prevalence of hypertension, hyperlipidemia, and breast cancer.[9] In the elderly, physical activity is also associated with reduced symptoms of such common ailments as insomnia[14] and arthritis.[15] Physical activity among youth has been associated with reduced risk of important societal problems such as adolescent pregnancy[16] and illicit drug use.[17] In all age groups, physical activity is associated with decreased risk of depression and poor mental health[18] and with overall improved quality of life.[19,20] Most benefits of regular physical activity accrue only gradually over time. However, immediate improvements in daily functioning such as increased alertness and cognitive performance, and decreased anxiety have been shown to occur after a simple 10- to 15-minute walk.[21,22]

Despite the widely acknowledged benefits of physical activity, most people fail to meet even minimal recom-

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mendations for healthful levels of regular physical activity.[11] The negative health consequences of television watching, reflecting the other end of the physical activity continuum, have recently been demonstrated prospectively in nurses.[23] Hu et al.[23] found that each 2-hour per day increment in TV watching was associated with a 23% increase in obesity risk and 14% increase in diabetes risk, after adjusting for age, exercise levels, dietary factors, and other covariates. Physical inactivity is more common among women, people of color, those of lower socioeconomic status, and overweight individuals.[1]

Unfortunately, there are insufficient data, particularly from ethnically and socioeconomically diverse populations, about effective public health messages and interventions to combat sedentary behavior, particularly among adults. While much attention in advertising and the media has been devoted to the obesity epidemic, it may also be important to promote physical activity independent of weight loss. Messages that promote physical activity primarily as a weight-loss strategy may have limited cross-cultural relevance. Several studies suggest that the prevalence of overweight is higher in cultures that are less likely to equate thinness with attractiveness.[24–29]

The present study examines sociodemographic, health status, health behavioral, and health-related self-perception correlates of physical inactivity in a large, multiethnic urban population. The study permits exploration of the factors associated with sedentariness, particularly overweight/obesity. Findings may be useful in social marketing messaging, health services planning, and intervention development, as both population-level and community-specific strategies must be employed to combat the escalating epidemic of sedentariness and obesity.

See related Commentary on page 183.

Methods

Survey Design and Data Collection

This study is based on findings from the adult component of the 1999–2000 Los Angeles County Health Survey (LACHS), a random-digit-dialed telephone survey of the non-institutionalized adult and child populations in Los Angeles County.[30] The Field Research Corporation (San Francisco CA) conducted the survey; interviews for the adult component were conducted from September 1999 through December 1999. The survey was reviewed and approved by the Institutional Review Board of the Los Angeles County Department of Health Services.

One adult from each randomly selected household was eligible for inclusion in the survey. In households with multiple adults, one adult was randomly selected for participation. Interviews were offered in English, Spanish, Cantonese, Mandarin, Korean, and Vietnamese. Interviews were conducted by trained staff using a standardized questionnaire and computer-assisted telephone interviewing. Of 15,301 eligible adults, 8353 completed interviews were obtained providing a 55% cooperation rate, using CASRO (Council of American Survey Research Organizations) standards. This cooperation rate is similar to the cooperation rate (51%) from physical activity surveillance data recently published and based on 2001 Behavioral Risk Factor Surveillance System (BRFSS) data.[31] Data were weighted to reflect the age, gender, and racial/ethnic distribution of the county population on the basis of 2002 projections from 2000 U.S. Census data.

Measures

Physical activity. Respondents were categorized as "sedentary" based on responses to standardized items from an adaptation of the short version of the International Physical Activity Questionnaire (IPAQ) available in early 1999.[32,33] Respondents were asked whether in a typical week, during leisure or work time, they engaged in "vigorous activities for more than 10 minutes at a time, such as running, aerobics, heavy yard work or anything else that causes large increases in breathing and heart rate," and if so, on how many days and how many minutes total they spent each day doing such activities. Respondents were also asked whether on an average day, they walked (proxy for moderate physical activity) for "at least 10 minutes at a time without stopping" and the total number of minutes walked on those occasions. Respondents were classified as "sedentary" if they reported no continuous physical activity for >10 minutes weekly at any level. A missing item in the developmental version of the IPAQ rendered it difficult to accurately distinguish between nonsedentary respondents meeting Centers for Disease Control and Prevention (CDC) recommendations for physical activity (regularly active) and those not meeting these criteria (irregularly active). Thus, only two levels of activity were included in the final analyses—sedentary and nonsedentary.

TV watching/using computer. Time spent watching TV or using the computer in a typical day was grouped into three categories: 0 to 1 hour daily, >1 and up to 3 hours daily, and >3 hours daily.

BMI. BMI was calculated based on self-reported weight and height (BMI=kg/m^2) with standard values for four categories defined as "underweight" (<18.5); "normal" (18.5 to 24.9); "overweight" (25 to 29.9); and "obese" (≥30.0).[34]

Self-rated health and weight status. Measures of self-rated health included self-perceived health status ("Would you say that in general your health is excellent, very good, good, fair or poor?"), and a mental health measure of self-perceived depression ("During the past 4 weeks, how often have you felt sad, blue or depressed?"). In addition, a measure of self-perceived weight status ("Do you consider yourself to be overweight, underweight, or about average for your height?") was asked of respondents aged <65.

Health behaviors. Fruit and vegetable consumption was measured by a single item assessing the total number of servings of fruits and vegetables that respondents reported having

eaten on the day prior to the interview. Current smoking was based on whether the respondent reported smoking cigarettes in the 30 days prior to the interview.

Chronic conditions. Separate questions obtained information about whether "a doctor or health professional had ever told you that you have" diabetes, hypertension, heart disease, asthma, a chronic respiratory condition, high blood cholesterol, or depression or other depressive disorder.

Sociodemographic and social environmental measures. These included age, gender, ethnicity, racial background, educational attainment, country of birth, and poverty level, which is based on household income, size, and composition. (For example, in 1999, the 100% federal poverty level [FPL] for a family of two adults and two dependents was $16,895 per year, the 200% FPL was $33,790 per year, and the 300% FPL was $50,685 per year.) Perceptions of neighborhood safety were assessed with two questions: "How safe from crime do you consider your neighborhood to be—very safe, somewhat safe, somewhat unsafe, or not at all safe?" and "During daylight hours, how often are you afraid to do certain activities in your neighborhood, like exercising or walking outside-almost everyday, on some days, or never?"

Analytic Approach

Descriptive analyses. Bivariate analyses were used to compare the percentage of sedentary and nonsedentary adults on measures of BMI, self-rated health (overall and mental health), self-perceived weight status, each diagnosed chronic condition, fruit and vegetable intake, leisure hours of TV watching/computer use, current smoking, and neighborhood safety to assess correlates of sedentary behavior.

Multivariate analyses. Multiple logistic regression was used to identify the independent contributions of the sociodemographic, chronic condition, health behavior, and self-rated health and weight indicators of sedentariness. Model specification included the following evaluation sequence: (1) variable selection based on predetermined inclusion/exclusion criteria; (2) examining multicollinearity among independent variables; (3) examining regression coefficients and standard errors of individual variables and product terms (i.e., interactions); (4) inspecting overall model goodness-of-fit measures; and (5) using logistic regression diagnostics to identify influential observations (i.e., outliers). This sequence of steps was repeated until a final model was identified. SUDAAN (Software for the Statistical Analysis of Correlated Data [SUDAAN], Version 8.0, Research Triangle Park NC, 2001) was used to estimate the coefficients and standard errors of the model variables that took into account the complex survey design used in this study and SAS (Version 8.0, SAS Institute Inc., Cary NC, 1999) was used to conduct the regression diagnostics.

Model Specification

Univariate logistic regression models showed that all indicators in Table 1 except for asthma diagnoses were statistically significant at an alpha level of 0.25,[35,36] and were included in the initial multiple logistic model. Multicollinearity diagnostics indicated that all independent variables had acceptable levels on tolerance and variance inflation indices. Sociodemographic indicators were "forced in" the preliminary models to evaluate the contribution of the "exposure" variables (e.g., chronic condition, health behavior, and self-rated health and weight indicators). In the final model, race/ethnicity, income, and BMI were deleted, as they were not contributing to the model and their removal did not appreciably change the regression coefficients of the exposure variables. Separate models that included all main effects and each two-way product term were examined and none were found to improve on the main effects only model. Regression diagnostics, including plots of the Pearson and deviance residuals, and differences in regression coefficients of each indicator against the predicted probabilities, were used to identify influential observations. Regression coefficients for models refit after removal of influential observations tended to be larger relative to their standard error, but overall, large fluctuations in the coefficients were not observed. Hence, no meaningful differences were observed between the original and refit models; findings presented in Table 2 are based on the original model.

Results

Sociodemographic Associations of Physical Inactivity

Results from the descriptive bivariate analysis are provided in Table 1. Factors included in the final multivariate model are presented in Table 2 with odds ratios (OR) and their 95% confidence intervals. Forty-one percent of Los Angeles County residents are sedentary. Women are nearly twice as likely as men to be sedentary (OR=1.89; 95% CI=1.67–2.15). The prevalence of sedentary behavior is higher with advancing age, from 27% of people aged 18 to 24 (referent group) to 52% of those aged 60 to 64 (OR=2.48; 95% CI=1.83–3.35), leveling off among those aged ≥65. Educational attainment was inversely related to sedentariness in both bivariate and multivariate analyses. Adults with a high school education or less were more likely to be sedentary than those with some college or more (OR=1.69; 95% CI=1.39–2.06). Non–U.S. born adults were also significantly more likely to be sedentary than U.S.-born adults in bivariate and multivariate analyses (OR=1.54; 95% CI=1.33–1.77).

Nearly half (46%) of Latinos, 41% of Asian Americans/Pacific Islanders, 40% of African Americans, and 37% of whites were completely sedentary; however, race/ethnicity was not significant in the multivariate analysis. Similarly, while physical inactivity was inversely related to income level, from 32% sedentary among those with incomes at ≥300% of FPL to 52% sedentary among those with incomes <100% of FPL, income level was not significant in the multivariate model.

Other Lifestyle Choices

Sedentariness was associated with leisure-time TV watching and computer use, and current smoking in both the descriptive and multivariate analyses. First,

Table 1. Sedentary behavior by demographic, health, and behavioral indicators: Results of bivariate analyses, Los Angeles County, 1999

	Number	%	(95% CI)
Gender			
Male	3323	33.0	(1.9)
Female	4909	48.6	(1.6)
Age group			
18–24	1151	27.0	(2.8)
25–29	966	34.2	(3.5)
30–39	1974	39.6	(2.5)
40–49	1580	43.1	(2.8)
50–59	1060	46.1	(3.6)
60–64	370	51.6	(5.9)
≥65	1131	49.5	(3.3)
Race/ethnicity			
Latino	3223	45.6	(2.0)
White	3323	36.7	(1.9)
African American	822	39.6	(3.8)
Asian/Pacific Islander	706	40.8	(4.1)
Education			
Less than high school	1722	54.9	(2.7)
High school graduate	1725	42.3	(2.7)
Some college or trade school	2359	35.1	(2.2)
College or postgraduate degree	2388	31.4	(2.1)
Federal Poverty Level[b]			
<100% FPL	1401	52.5	(3.0)
100% to <200% FPL	1880	46.5	(2.6)
200% to <300% FPL	1637	41.1	(2.8)
≥300% FPL	3314	32.2	(1.9)
Birthplace			
U.S. born	5261	36.3	(1.5)
Foreign born	2965	48.0	(2.1)
Self-perceived health status			
Excellent/very good	4161	29.7	(1.6)
Good	2460	46.7	(2.3)
Fair/poor	1589	58.2	(3.0)
BMI[c]			
Obese	1310	51.3	(3.1)
Overweight	2630	38.8	(2.2)
Normal weight	3541	35.0	(1.8)
Self-perceived weight status[d]			
Overweight	3145	47.7	(2.0)
Average weight	3573	32.3	(1.8)
Self-perceived depression			
All/most of the time	579	57.0	(4.8)
Some/a little/none of the time	7628	39.5	(1.3)
Depression			
Diagnosed	721	48.3	(4.3)
Not diagnosed	7491	40.1	(1.3)
Heart Disease			
Diagnosed	594	54.8	(4.5)
Not diagnosed	7626	39.7	(1.3)
Arthritis			
Diagnosed	1398	49.0	(3.0)
Not diagnosed	6802	39.2	(1.3)
Diabetes			
Diagnosed	509	61.0	(4.8)
Not diagnosed	7698	39.4	(1.3)
High blood pressure			
Diagnosed	1560	48.0	(2.9)
Not diagnosed	6651	39.1	(1.4)
Neighborhood safety			
Afraid of doing activities in neighborhood	1510	45.8	(2.9)
Never afraid	6540	39.0	(1.4)
TV watching/computer using			
0–1 hours daily	2169	36.8	(2.4)
1–3 hours daily	3365	38.0	(1.9)
>3 hours daily	1501	45.8	(3.0)
Smoking			
Smoker	1443	41.8	(3.0)
Nonsmoker	6789	40.6	(1.4)
Fruit/vegetable consumption			
0–2 servings	4472	44.0	(1.7)
3–4 servings	2441	35.6	(2.2)
≥5 servings	1319	38.6	(3.1)
Los Angeles County Total	8232	40.8	(1.2)

[a]Persons with missing information were excluded.
[b]Poverty status is based on the 1999 FPL. In 1999, the 100% FPL for a family of two adults and two dependents was $16,895 per year, the 200% FPL was $33,790 per year, and the 300% FPL was $50,685 per year.
[c]Weight status is determined based on BMI and is calculated using the respondent's weight and height. According to NHLBI clinical guidelines, BMI <18.5 is underweight, BMI≥18.5 and <25 is normal weight, BMI≥25 and <30 is overweight, and a BMI≥30 is obese.
[d]Only asked of adults aged <65 years.
BMI, body mass index; FPL, federal poverty level.

adults who watched TV or used a computer in their leisure time for ≥3 hours daily reported the highest levels of sedentary behavior (46%) (OR=1.72; 95% CI=1.44–2.06), as compared to adults who watched TV or used a computer 1 to 3 hours daily (38%) (OR=1.22; 95% CI=1.06–1.41) and adults who watched TV or used a computer 0 to 1 hour daily (37%). Current smokers were also significantly more likely to be sedentary (OR=1.20; 95% CI=1.01–1.41).

Adults who reported eating two or fewer servings of fruits and vegetables the previous day had a higher prevalence of sedentary behavior (44%) as compared to adults who reported eating three to four servings of fruits and vegetables (36%) and five or more servings of fruits and vegetables (39%) the previous day. However, fruit and vegetable consumption was not significant in the multivariate model.

Perceptions of Neighborhood Safety

Respondents who reported being afraid to do outdoor activities during daylight hours in their neighborhoods were more likely to be sedentary (46%) than those who reported never being afraid (39%). This association was not significant in the multivariate results.

Self-Perceived Health

Both the perception of overall health as fair or poor, and feelings of sadness or depression all or most of the time were significantly associated with sedentariness. Fifty-eight percent of those who perceived their health

Table 2. Factors significantly associated with sedentary behavior in the multivariate regression analysis

	Adjusted OR[a]	95% CI
Gender		
Male	Referent	
Female	1.89	1.67–2.15
Age group		
18–24	Referent	
25–29	1.5	1.19–1.89
30–39	1.86	1.52–2.27
40–49	2.04	1.65–2.52
50–59	2.12	1.68–2.67
60–64	2.48	1.83–3.35
Education		
Less than high school	1.69	1.39–2.06
High school graduate	1.33	1.10–1.60
Some college or trade school	1.07	0.91–1.27
College or postgraduate degree	Referent	
Birthplace		
U.S. born	Referent	
Foreign born	1.54	1.33–1.77
Self-perceived health status		
Excellent/very good	Referent	
Good	1.53	1.32–1.78
Fair/poor	1.74	1.44–2.11
Self-perceived weight status		
Overweight	1.46	1.28–1.66
Average weight	Referent	
Self-perceived depression		
All/most of the time	1.29	1.00–1.67
Some/a little/none of the time	Referent	
Diabetes		
Diagnosed	1.48	1.10–2.00
Not diagnosed	Referent	
TV watching/computer using		
0–1 hours daily	Referent	
<1–3 hours daily	1.22	1.06–1.41
>3 hours daily	1.72	1.44–2.06
Smoking		
Smoker	1.2	1.01–1.41
Nonsmoker	Referent	

[a]Multivariate model adjusted for the following variables: gender; age group; education; birthplace; self-perceived health status, weight status, and depression; diabetes; TV watching/computer using; and current smoking.
CI, confidence interval; OR, odds ratio.

to be fair or poor were sedentary compared to those who perceived their health to be good (47%) or very good/excellent (30%). Perception of fair or poor health was significantly associated with sedentary behavior (OR=1.74; 95% CI=1.44–2.11), as was self-perceived depression (OR=1.29; 95% CI=1.00–1.67).

BMI and Perceived Overweight

Obese adults (51%) were more likely to be sedentary than overweight adults (38%) and normal weight adults (35%). Furthermore, adults who perceived themselves to be overweight (48%) were more likely to be sedentary than adults who perceived themselves to be of average weight (32%). In the multivariate model, self-perceived overweight, not BMI, was significantly associated with sedentary behavior (OR=1.46; 95% CI=1.28–1.66). (Perceived overweight and BMI are moderately correlated, so BMI would have been retained in the multivariate model had it not been for the presence of perceived overweight. However, perceived overweight was a much more robust correlate.)

Chronic Health Conditions

Higher sedentary rates observed in the descriptive analysis for several chronic conditions (diagnosed heart disease, arthritis, diabetes, hypertension, high blood cholesterol, and diagnosed depression) were not significant predictors of sedentary behavior in the multivariate model, with the notable exception of diabetes. Sixty-one percent of adults diagnosed with diabetes were sedentary, as compared to 39% of adults not diagnosed with diabetes, and diabetes remained significant in the multivariate model (OR=1.48; 95% CI=1.10–2.00).

Discussion

Los Angeles County rates of sedentariness and overweight are comparable to national data.[3,11] Among Los Angeles' culturally heterogeneous population, physical inactivity is associated with negative perceptions of mental and physical health, lower educational attainment, higher smoking rates, and higher levels of television watching/computer use. Educational attainment may be a better proxy for important physical or social environmental influences, that is, perceived or actual access to healthier weight-related lifestyle choices, than income, perceived neighborhood safety, or ethnicity. This may account for the failure of these latter variables to be retained in the final multivariate model. Also, many environmental factors encouraging or discouraging physical activity were not examined, such as presence of sidewalks, worksite programs/facilities, traffic volume, exposure to marketing and advertising, and proximity of open space. Data from other sources suggest that neighborhood influences on physical activity and weight status varying by neighborhood include availability of supermarkets, quality and variety of produce and other healthy food choices within smaller groceries, fast food outlets, and recreational facilities.[37–39] In fact, the only recreational facilities evenly distributed between the more- and less-affluent areas surveyed in Los Angeles were basketball courts.[39]

The finding that self-perceived overweight, not overweight empirically derived from self-reported BMI, contributed to the multivariate model predicting sedentary behavior is worth noting. Burns et al.[40] observed

What This Study Adds . . .

We have documented a high prevalence of sedentariness in a large, urban, multi-ethnic population.

Mental and physical health status, gender, and educational attainment were prominent correlates of sedentariness.

Ethnicity was associated with inactivity in bivariate but not multivariate analyses, probably because ethnic differences were diminished when statistically controlling for educational attainment and self-perceived overweight status.

These data are useful in informing the development of public health messages and intervention research to promote physical activity.

that perceived overweight was more important than measured overweight for predicting 5-year declines in general health and vitality in a large, representative sample of Dutch men. Perceived overweight predicted similar declines among Dutch women, but so did measured overweight. In this ethnically diverse Los Angeles County sample, perceived overweight is, in part, responsible for the failure of ethnicity to be retained in the multivariate model; ethnic differences in overweight self-perception among overweight and normal weight individuals are present, with African Americans and Latinos significantly less likely to perceive themselves as overweight (data not shown). Of course, the cross-sectional nature of the data does not illuminate the directionality of this association, that is, whether perceiving oneself as overweight diminishes motivation to be active, or inactivity increases more negative self-perceptions such as overweight, or whether interaction exists. In any case, public health interventionists should consider targeting perceived overweight in addition to "measured" overweight in their efforts to decrease sedentariness, particularly in engaging overweight/nonobese individuals.

The findings in this report are subject to a number of limitations. First, households without telephones were excluded from the sampling frame and therefore are not represented in the findings. Second, the 55% cooperation rate is a potential source of bias due to nonresponse. However, this standard CASRO cooperation rate is comparable to or better than the CASRO cooperation rates for the CDC's BRFSS in 27 states; for instance, recently published physical activity surveillance 2001 BRFSS data are based on a 51% rate.[31,41] Third, data on physical activity were self-reported and, as such, are subject to reporting bias (less or more physical activity than captured by our items) and misclassification. In addition, difficulties with an earlier developmental version of the IPAQ permitted accurate classification only of sedentary versus nonsedentary respondents. However, preliminary analyses with three levels of activity status demonstrated expected "intermediate" associations of the irregularly active between those for the sedentary and those for the regularly active. Similar to previous research, the greater differences were between the sedentary and nonsedentary, rather than the irregularly and regularly active. Height and weight were also self-reported, with predictable small errors in over-reporting of height by shorter individuals and under-reporting of weight by heavier individuals.[42] Respondents who did not speak either English or one of the four other non–English languages provided (estimated at <1% of non–English speaking population in Los Angeles County) were not represented. Dietary data were limited to responses to a single survey item querying the total number of servings of fruits and vegetables consumed on the day prior to interview. Lastly, as previously noted, data are cross-sectional in nature, permitting only speculation as to causation.

The overarching lack of physical or sociocultural environmental support for physical activity is well documented.[43,44] Likewise, the explanatory capacity of the individual-level predictors in this and other comparable data modeling[45,46] is generally quite modest. Sociocultural and physical environmental variables are important predictors and modifiers of physical activity, and must be addressed in addition to individual-level influences in efforts to achieve and sustain higher levels of physical activity.[46] Similar to the challenge of minimizing tobacco smoke exposure 2 decades ago, the U.S. epidemic of obesity and sedentariness is now of sufficient societal magnitude and cost that increasing physical activity participation can no longer be treated as solely an individual responsibility. As a significant portion of these costs is borne by government, government at all levels has an economic interest in fostering measures that reduce the epidemic. Government agencies themselves, for example, can play a leadership role in changing the sociocultural environment. This may be accomplished by changing their own organizational practices/cultures internally[47] and by including mandates for healthy/fit workplace practices in their contracting agreements with other organizations. As worksite physical activity promotion research within the Los Angeles County Department of Health Services and the greater Los Angeles community has demonstrated, sedentary, overweight, and diverse captive audiences of adults can be engaged in physical activity during the routine conduct of business.[47–49] Society must share with its members some of the "cost" of adopting and maintaining an active lifestyle.

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