National Survey of US Long-Haul Truck Driver Health and Injury

Health Behaviors

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Objective: To compare selected health behaviors and body mass index (modifiable risk factors) of US long-haul truck drivers to the US working population by sex. **Methods:** The National Survey of US Long-Haul Truck Driver Health and Injury interviewed a nationally representative sample of long-haul truck drivers ($n = 1265$) at truck stops. Age-adjusted results were compared with national health surveys. **Results:** Compared with US workers, drivers had significantly higher body mass index, current cigarette use, and pack-years of smoking; lower prevalence of annual influenza vaccination; and generally lower alcohol consumption. Physical activity level was low for most drivers, and 25% had never had their cholesterol levels tested. **Conclusions:** Working conditions common to long-haul trucking may create significant barriers to certain healthy behaviors; thus, transportation and health professionals should address the unique work environment when developing interventions for long-haul drivers.

Research has shown that the modifiable risk factors of personal behavior and obesity can be powerful determinants of health and longevity.[1–6] Nevertheless, working conditions common to long-haul truck drivers may impede successful management of these modifiable risk factors. Because of the distances that long-haul truck drivers carry their freight, they do not return home each day. Consequently, most long-haul drivers sleep, eat, buy provisions, and spend their off duty time at truck stops, which may not offer quiet sleep environments, affordable healthy food choices, or safe opportunities for exercise.[7–10] Some drivers also use dangerous stimulants[11,12] or tobacco[13] as a way to help them stay awake during long, monotonous hours of driving. Finally, although long-haul drivers must pass a medical examination at least every 2 years, they may not receive routine preventative health care, such as recommended immunizations and health screenings, because of irregular work schedules and long periods away from home.[14] These occupational barriers to healthy behavior may contribute to the observed increased risk for numerous health conditions among truck drivers, including diabetes,[15] heart disease,[16–19] hypertension,[20–22] lung cancer,[23–26] and other cancers.[24,27–29]

Long-haul truck drivers are a difficult-to-reach study population; traditional mail and telephone surveys are impractical because these drivers are away from home most of the time, and an efficient sampling frame does not exist. For these reasons, the majority of studies on truck driver health have been conducted with local or regional drivers who return home daily. To augment the sparse health and safety data that exist for US long-haul truck drivers, the National Institute for Occupational Safety and Health conducted the National Survey of US Long-Haul Truck Driver Health and Injury (LHTDS). The LHTDS collected data on health behaviors and other modifiable risk factors, health conditions, working conditions, work-related injuries, and fatigue. This paper reports the results for body mass index (BMI) and health-related behavior from LHTDS and compares them to the US workforce using data from national health surveys.

METHODS

Survey Methods and Study Population

The LHTDS collected occupational safety and health information from a nationally representative probability sample of 1265 long-haul truck drivers at 32 truck stops throughout the 48 contiguous United States. The LHTDS used a weighted sampling process with three stages as follows: (1) selecting highway sections on the basis of geographical region and traffic volume; (2) selecting individual truck stops on those highway sections; and (3) recruiting long-haul drivers entering the selected truck stops. Drivers met the study definition of a long-haul truck driver if they (1) drove a truck as their main occupation; (2) drove a truck with three or more axles, which requires a commercial driver's license; and (3) took at least one mandatory 10-hour rest period away from home on each delivery run. Individuals also needed to have at least 12 months experience as a long-haul driver to participate in the study. The survey was conducted from October through December 2010. Details of the sampling plan, the study population, and data collection can be found in Sieber et al.[15] Although the overall data collection consisted of a personal interview, on-site measurement of height and weight, and a sleep/activity log completed by the drivers, the results presented here utilized only the personal interview data.

To produce estimates for the US workforce, we used data from currently employed respondents of either the National Health Interview Survey (NHIS) or the Behavioral Risk Factor Surveillance System (BRFSS), depending on the modifiable risk factor being evaluated. The National Health Interview Survey is a national household interview survey that provides health information for the US civilian population not living within institutions (eg, prisons or nursing homes).[30] A probability sample is obtained through the use of a multistage sample design. The 2010 NHIS participants were included if they were actively working in the week prior to the interview and they

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were 20 years of age or older to match employment and age characteristics of LHTDS participants. Only civilian NHIS participants were included, because NHIS was not designed to produce estimates for armed forces personnel. This resulted in an NHIS comparison population of 14,525 individuals.

The BRFSS is a telephone survey conducted by all 50 US states as well as the District of Columbia, Puerto Rico, Guam, and the Virgin Islands in collaboration with the Centers for Disease Control and Prevention.[31] In 2009, the BRFSS used a probability sample of all households with landline telephones within each state/territory to estimate behavioral risk factors for the adult population. The 2009 BRFSS respondents were included if they were currently employed for wages, resulting in a comparison population of 176,918.

Measures of Health Behavior and BMI

Where practical, the LHTDS utilized questions included in NHIS, which allowed for comparison of the data from each survey for the following behaviors: (1) cigarette smoking status, (2) age at which smoking began, (3) cigarettes smoked per day, (4) pack-years of smoking, (5) usual hours of sleep obtained each day, (6) the number of days any type of alcoholic beverage was consumed in the last 12 months and the number of drinks consumed on those days, and (7) influenza vaccination in the last 12 months. We were also able to compare BMI as an indicator for obesity, utilizing self-reported height and weight. We report not only mean BMI, but also the prevalence of BMI 35 or higher, which has been linked with increased crash risk.[32] The LHTDS question on cholesterol screening was modeled from the 2009 BRFSS because NHIS does not routinely ask respondents if they have ever had their blood cholesterol checked.

In addition, LHTDS collected information on stimulant use and total physical activity. To measure stimulant use, interviewers asked participants if they used medication or drugs to help them stay awake while driving, including legal, illicit, and prescription substances, but not caffeine. To measure total physical activity, interviewers asked LHTDS participants how many days in the past week they did moderate or vigorous physical activities for at least 30 minutes at a time, including both work-related activity (such as loading cargo) and leisure time activities. Moderate to vigorous activity was defined as activity that caused at least a slight increase in breathing or sweating. This question was designed to allow comparison of driver activity to the Department of Health and Human Services recommendations for weekly physical activity.[4]

Analysis

Probability weights were used to calculate either mean or prevalence estimates of BMI and health-related behaviors among LHTDS participants.[15] The National Health Interview Survey public-use data from 2010[33] were used to produce comparable weighted estimates for the US adult working population for outcomes 1 to 7 above. Body mass index was calculated from reported height and weight using the formula and conversion factors utilized by NHIS.[30] Sex-specific and age-adjusted estimates are reported for all LHTDS and NHIS results. We utilized the 2010 Current Population Survey estimates of employed individuals in the civilian non-institutional population for all age-adjusted results.[34] Age-adjusted estimates used 10-year age groups (20 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, and 60 and older).

The LHTDS and NHIS data were analyzed with SAS/STAT software, Version 9.3.2 (SAS Institute Inc., Cary, NC) using the SURVEREG procedure.[35] Variances were calculated using the Taylor series method.[36] The difference between two comparable estimates was considered statistically significant if the 95% confidence intervals (CIs) did not overlap.

The BRFSS data were used to produce the weighted prevalence of cholesterol screening among the US adult working population. Analysis of the BRFSS data was performed with the BRFSS Web Enabled Analysis Tool, using the Cross Tabulation Analysis function.[37]

RESULTS

The weighted distributions of sex and age differed greatly between LHTDS participants (hereafter referred to as long-haul drivers) and the NHIS comparison population (hereafter referred to as US workers) (Table 1); long-haul drivers were older, and men dominated the occupation. For this reason, all estimates presented are age-adjusted and sex specific. Ethnicity and race are similar to the US workforce, although Hispanics are underrepresented among long-haul drivers (Table 1).

Exposure to cigarette smoking was significantly higher among male and female long-haul drivers than among US workers (Table 2). Drivers started smoking at a younger age, smoked more cigarettes per day, were more likely to start smoking (ever smoker = 100 cigarettes in their lifetime), and were more likely to be current smokers (46.2% for men and 54.9% for women) than US workers (20.6% for men and 17.4% for women). Drivers accumulated more pack-years of smoking (27.3 years for men and 23.1 years for women) than US workers (18.1 years for men and 15.4 years for women).

In general, long-haul drivers used less alcohol than US workers (Table 2). Among those averaging fewer than five drinks on the days they drank alcohol, male and female long-haul drivers drank significantly fewer drinks per year (41.6 for men and 33.2 for women) than US workers (132.5 for men and 80.1 for women). Although male drivers were significantly more likely to average five or more drinks on the days they drank alcohol (at-risk drinking) than male US workers (21.0% for drivers vs 12.7% for US workers), they did so on significantly fewer days per year (37.8 for drivers vs 106.5 for US workers). The prevalence of stimulant use to stay awake was 2.4% among male drivers (Table 2). Fewer than nine female drivers indicated that they engaged in either at-risk drinking or stimulant use; therefore, estimates for these behaviors could not be generated.

Mean BMI was significantly higher for both male and female long-haul drivers than US workers (Table 3). Prevalence of class II obesity and excessive obesity (BMI of 35 or greater) among male long-haul drivers was three times that of male US workers (31.3% vs 9.1%). Male and female long-haul drivers reported about 40 minutes more sleep daily than the US workforce (Table 3). Male and female long-haul drivers were significantly less likely to be vaccinated for influenza in the previous 12 months than US workers (Table 3). The prevalence of never having a cholesterol test was 25.2% for male drivers and 34.4% for female drivers (Table 3), compared with 21.3% of men (95% CI, 20.6 to 22.0) and 15.9% of women (95% CI, 15.4 to 16.4) currently employed for wages participating in the 2009 BRFSS. The physical activity level for the majority of long-haul drivers was low; over the previous week, zero days of activity were reported by 28.4% of men and 25.2% of women, whereas 73.8% of men and 80.5% of women reported less than 30 minutes of moderate activity on 5 days (Table 3).

DISCUSSION

This study found a high prevalence of modifiable risk factors such as obesity, cigarette smoking, and low physical activity levels among a nationally representative sample of 1265 US long-haul truck drivers (hereafter referred to as long-haul drivers). Previous research provides evidence that long-haul drivers contend with significant barriers to healthy behaviors because of their working conditions.[7–14] In addition, company policies or poor equipment design may create obstacles. For example, some companies do not allow their drivers to install appliances in the truck that would help put them in better control of their diets, such as microwaves or small refrigerators, and truck sleeper cabs may be inadequately sound proofed, leading to poor sleep quality when parked in noisy truck stop parking lots. [Anonymous verbal reports] In addition, truck drivers are permitted

TABLE 1. Demographic Characteristics of US Long-Haul Truck Drivers and the US Workforce: Weighted National Estimates and 95% Confidence Intervals*

	US Long-Haul Truck Drivers			US Workforce†	
Age Group	***n* (%)**	**95% CI**		***n* (%)**	**95% CI**
20 to 29 yrs of age	69 (**5.1**)	3.3	6.9	2,985 (21.7)	20.8	22.6
30 to 39 yrs of age	254 (**16.9**)	14.5	19.4	3,470 (22.1)	21.3	22.9
40 to 49 yrs of age	401 (**32.9**)	30.9	35.0	3,442 (24.7)	23.8	25.6
50 to 59 yrs of age	386 (**29.2**)	26.8	31.6	2,936 (20.6)	19.7	21.5
60+ yrs of age	155 (**15.9**)	13.1	18.6	1,692 (10.9)	10.3	11.5
Sex						
Men	1,184 (**93.5**)	91.8	95.1	7,178 (53.3)	52.1	54.4
Women	81 (**6.5**)	4.9	8.2	7,347 (46.7)	45.6	47.9
Ethnicity/race‡						
Hispanic, all races	106 (**8.7**)	5.6	11.8	2,849 (14.1)	13.3	15.0
Non-Hispanic white	862 (68.7)	65.7	71.7	8,354 (68.7)	67.6	69.8
Non-Hispanic African American	190 (16.3)	10.1	22.5	2,086 (10.5)	9.7	11.3
Non-Hispanic other race	95 (6.3)	3.4	9.2	1,236 (6.6)	6.1	7.2

CI, confidence interval; *n* column reports unweighted frequencies.
*Bolded text indicates confidence interval does not overlap with that of the US Workforce.
†US Workforce Data Source: CDC/NCHS, National Health Interview Survey, 2010 (33).
‡Some participants excluded because of missing data.

to spend up to 11 hours of each workday driving, and up to 14 hours of each workday on duty.[38] Thus, drivers may spend most of their work time being sedentary and may have as little as 10 hours each day for all of their personal needs, such as sleep/rest, laundry, and meals, leaving little time for exercise.

A BMI of 30 or greater (obesity) is associated with numerous adverse health outcomes, including diabetes, hypertension, and high cholesterol.[3] Obesity is a risk factor that may be strongly influenced by the working conditions common to long-haul drivers.[9,10] It is not surprising then that long-haul drivers had a mean BMI of 32.6 regardless of sex. Other studies have also found a high prevalence of obesity among all truck drivers[39] and long-haul truck drivers.[40] Among LHTDS participants, Sieber et al[15] reported that 68.9% of drivers were obese, and compared with US workers, long-haul drivers had a higher prevalence of ever being told they had diabetes (significant at 14.4%, 95% CI, 9.4 to 21.6 vs 6.8%, 95% CI 6.3 to 7.2) and hypertension (not significant at 26.3%, 95% CI, 20.6 to 33.0 vs 24.1%, 95% CI, 23.3 to 24.9). Furthermore, more than 21% of drivers had high cholesterol, a strong risk factor for atherosclerosis, and coronary heart disease.[5] Screening for high cholesterol is important because early intervention provides the greatest long-term benefit.[41] Nevertheless, LHTDS participants were less likely than the US workforce to have ever been screened, even though more met the screening criteria[42] because of obesity.

Obesity has been reported to be an independent risk factor for work-related injury across various occupations.[43] The upper end of the obesity range includes class II obesity ($35 \leq BMI < 40$) and extreme obesity ($BMI \geq 40$). A prospective study of 744 new truck drivers found that drivers with a BMI of 35 or greater were 1.43 (95% CI, 1.11 to 1.84) times more likely to be involved in a motor vehicle crash than drivers with a BMI in the normal range ($18.5 < BMI < 25$), after adjusting for miles driven, age, and sex.[32] Although this is only one study, the very high prevalence of BMI of 35 or greater among LHTDS participants suggests that further research is needed to fully understand the association between class II and extreme obesity and crash risk.

There is strong evidence that adults can reduce their risk of coronary heart disease, stroke, high blood pressure, and type 2 diabetes by engaging in moderate to vigorous physical activity (MVPA) at least 2.5 hours per week (equivalent to 30 minutes/5 days per week), regardless of BMI.[4] In addition, physical activity is associated with improved sleep, reduced stress response, enhanced alertness and vigor, and reduced risk of motor vehicle crashes.[44] This study found that long-haul drivers are not very active, with only 26.2% of men and 19.5% of women reporting 30 minutes of continuous MVPA on 5 or more days in the past week, even when including working activities such as loading and unloading. This is likely to be an overestimate, given that self-reported MVPA levels tend to be much higher than actual MVPA levels.[45] In comparison, 51.6% of the adult US population met aerobic activity guidelines during leisure time activity alone (measured as 2.5 hours of moderate or 1.25 hours of vigorous activity per week).[46]

The health consequences of smoking include numerous cancers, cardiovascular and respiratory diseases, and ulcers,[1] and smokers die an average of 13.2 to 14.5 years earlier than nonsmokers.[2] Numerous studies have shown smoking to be very prevalent among truck drivers.[47–49] This study adds to the literature by reporting pack-years of smoking, which was significantly elevated for long-haul drivers when compared with US workers. Furthermore, current smoking was three times more prevalent among female drivers than among females in the US workforce. Long-haul drivers may be more likely to smoke because they are generally not subject to smoking bans while in their truck, and because they may feel smoking is helpful for combating fatigue.[13]

Alcohol use was generally lower for long-haul drivers than it was for US workers. This is consistent with previous research reporting reduced risk of mortality[48] and hospitalization[50] for alcohol-related causes among truck drivers. Strict federal regulations regarding alcohol consumption make it unlikely that drivers who cannot control their alcohol use would remain in the profession for long.[51,52] Nevertheless, the prevalence of at-risk drinking (five or more drinks in 1 day) was significantly higher for male long-haul drivers. One can hypothesize that long-haul drivers may "catch up" on their social drinking on their days off while abstaining on days they work, thus increasing the likelihood of episodic at-risk drinking while keeping overall alcohol consumption low. Male drivers had fewer days of

TABLE 2. Age-Adjusted Cigarette, Alcohol, and Stimulant Use Among US Long-Haul Truck Drivers and the US Workforce: Weighted National Estimates and 95% Confidence Intervals*

	US Long-Haul Truck Drivers			US Workforce†		
	Estimate	95% CI		Estimate	95% CI	
Cigarette smoking						
Mean age first smoked‡						
Men	**16.4**	16.0	16.7	17.6	17.4	17.7
Women	**15.4**	14.1	16.8	17.8	17.7	18.0
Mean cigarettes per day§						
Men	**18.5**	16.5	20.6	13.3	12.8	13.9
Women	**19.2**	15.8	22.6	11.3	10.8	11.9
Mean pack-years§						
Men	**27.3**	24.1	30.5	18.1	17.3	18.9
Women	**23.1**	18.3	28.0	15.4	14.5	16.2
Prevalence ever smokers						
Men	**65.3%**	60.2	70.5	43.0%	41.2	44.7
Women	**68.3%**	55.7	81.0	34.3%	33.1	35.6
Prevalence current smoker						
Men	**46.2%**	40.3	52.2	20.6%	19.4	21.9
Women	**54.9%**	42.8	67.1	17.4%	16.2	18.6
Prevalence former smoker						
Men	19.1%	15.6	22.6	22.3%	20.8	23.8
Women	13.4%	3.4	23.4	16.9%	16.1	17.8
Alcohol use						
Consumes <5 drinks per day						
Mean drinks/yr						
Men	**41.6**	30.9	52.3	132.5	125.1	139.8
Women	**33.2**	3.4	63.1	80.1	76.6	83.6
Consumes 5+ drinks per day						
Prevalence						
Men	**21.0%**	17.8	24.3	12.7%	11.7	13.6
Women	13.1%	2.7	23.4	3.8%	3.2	4.5
Mean days drinking/yr						
Men	**37.8**	21.4	54.2	106.5	96.4	116.5
Women	NE			60.4	39.4	81.4
Prevalence stimulant use to stay awake‖						
Men	2.4%	1.1	3.7			
Women	NE					

CI, confidence interval; NE, no estimate because of small number of observations (less than 9).
*Bolded **text** indicates confidence interval does not overlap with that of the US Workforce. Age adjustment by 10-year age groups.
†US Workforce Data Source: CDC/NCHS, National Health Interview Survey, 2010 (33).
‡Includes current and former smokers.
§Includes current smokers only.
‖Question not comparable to NHIS.

at-risk drinking than US workers; however, it has been reported that engaging in even 1 or 2 days of at-risk drinking per year increases the prevalence of alcohol abuse and alcohol dependence,[53] causing problems such as failure to fulfill expectations at work or home, increased physical hazards, legal problems, social/interpersonal problems, or an inability to control drinking behavior.[54]

Previous research suggests that stimulant use is an important problem for US truck drivers. Couper et al[47] reported that 9.5% of truck drivers in Oregon and Washington state tested positive for central nervous system stimulants such as amphetamine, cocaine, and pseudoephedrine. In this study, only 2.4% of male long-haul drivers reported using stimulants to stay awake while driving over a 2-day period. Our estimate may differ from Couper et al because LHTDS participants may have been wary of reporting even legal stimulant use, or because our survey asked only about stimulants used to manage fatigue (not recreational or medical uses). Stimulants such as cocaine and amphetamines are known to induce intense vasoconstriction, hypertension, and blood clot formation, all of which can lead to a heart attack or permanent damage to the heart muscle.[5] Use during driving has been shown to multiply the risk of a fatal crash by 3 to 4.5.[55] The Safe Roads Act of 2012[56] may reduce the abuse of illicit stimulants by establishing an electronic clearinghouse, where employers can check for previous controlled substance violations or testing refusals among commercial driver's license holders.

Long-haul drivers reported more daily sleep than US workers. Although this finding may surprise some, McCartt et al[57] found that US truck drivers reported getting more sleep after new Hours of Service regulations increased the minimum daily rest period from

TABLE 3. Age-Adjusted BMI, Physical Activity, Sleep, Influenza Vaccination, and Cholesterol Screening Among US Long-Haul Truck Drivers and the US Workforce: Weighted National Estimates and 95% Confidence Intervals

	US Long-Haul Truck Drivers			US Workforce†		
	Estimate	95% CI		Estimate	95% CI	
Mean body mass index (BMI)						
Men	**32.6**	31.3	33.8	28.1	28.0	28.3
Women	**32.6**	30.1	35.1	27.3	27.1	27.5
Prevalence class II obesity or greater (BMI 35+)						
Men	**31.3%**	24.2	38.4	9.1%	8.3	10.0
Women	23.3%	9.3	37.3	11.4%	10.4	12.3
Prevalence physical activity in last 7 days‡						
Less than 5 d with 30 min						
Men	73.8%	68.8	78.9			
Women	80.5%	68.0	93.0			
Zero days with 30 min						
Men	28.4%	24.7	32.2			
Women	25.2%	12.0	38.3			
Mean hours of sleep						
Men	**7.7**	7.6	7.9	7.0	7.0	7.0
Women	7.6	7.1	8.1	7.0	7.0	7.1
Prevalence no influenza vaccination						
Men	**80.6%**	75.7	85.4	70.6%	69.3	72.0
Women	**80.5%**	71.6	89.3	59.7%	58.3	61.2
Prevalence no cholesterol screening§						
Men	25.2%	19.6	30.8			
Women	34.4%	25.1	43.7			

CI, confidence interval.
Bolded **text** indicates confidence interval does not overlap with that of the US Workforce. Age adjustment by 10-year age groups.
†US Workforce Data Source: CDC/NCHS, National Health Interview Survey, 2010 (33).
‡Question not comparable to NHIS.
§Question not comparable to NHIS; see Results section for BRFSS estimates.

8 hours to 10 hours; after the rule change, the number of drivers reporting fewer than 8 hours of sleep fell by more than 12%. Interestingly, the study by McCartt et al [57] also reported increased fatigue among these drivers, possibly because of other changes incorporated into the new rule, or changes in overall health or the working environment. It is also important to note that 35% of McCartt's drivers still slept less than 8 hours per day after the new rules, and 26.5% of LHTDS participants slept 6 or fewer hours per day.[15] The relationships among the quality and quantity of sleep, fatigue, and health are complex and beyond to scope of this paper.[58] Future analyses of LHTDS data will shed more light on these issues for long-haul drivers.

STRENGTHS AND LIMITATIONS

The LHTDS was the first survey to capture a nationally representative sample of US long-haul truck drivers, enabling us to generate national estimates of health behavior and BMI. Furthermore, the LHTDS used questions from NHIS and BRFSS, allowing us to make comparisons between US long-haul drivers and US working adults. This comparison between two groups of actively working adults reduced the likelihood that the healthy worker effect would mask elevated risk among long-haul drivers.[48,59] We used a conservative method to determine statistical significance,[60] thus increasing the likelihood that significant differences observed in this study reflect actual differences between long-haul drivers and US workers.

The limitations of this study are common to many surveys. Our data are from self-report, so some information provided by participants may be subject to recall or reporting bias influenced by the way questions and response categories were constructed.[61] Nevertheless, most of the data for the US worker population were obtained with identical questions, helping to control any bias in our comparisons because of question construction. Although the small number of women in our sample was representative of the long-haul driver population, it did not allow us to examine their at-risk alcohol consumption or stimulant use. More details regarding the limitations because of study design were reported by Sieber et al.[15]

CONCLUSIONS

This study found that compared with the US workforce, US long-haul truck drivers had significantly higher prevalence of obesity and cigarette smoking and lower prevalence of cholesterol screening and influenza vaccination. Furthermore, only one quarter reported engaging in the recommended amount of physical activity. Although the percentage of male drivers who reported using noncaffeine stimulants to stay awake while driving was only 2.4%, the great risk associated with powerful stimulants such as amphetamine and cocaine makes any use a serious concern.

These findings suggest that long-haul drivers may benefit from interventions to improve the above modifiable risk factors. Although effective interventions exist for obesity, cigarette smoking, and other risk factors, working conditions common to long-haul trucking may create significant barriers to behavior change. Long-haul drivers may find it particularly difficult to obtain affordable healthy food, see a doctor regularly, or be physically active; and their job may actually

encourage unhealthy behaviors, such as smoking or using stimulants to maintain vigilance during long hours of driving. Transportation and health professionals should address the unique work environment when developing interventions for long-haul drivers.

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