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# Staying awake: truck drivers' vulnerability in Rio Grande do Sul, Southern Brazil

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## ABSTRACT

**OBJECTIVE:** To analyze factors associated with the use of stimulants by truck drivers to stay awake.

**METHODS:** A survey with 854 drivers was carried out at eight truck stops (seven gas stations and one border patrol post) located at five cities in the State of Rio Grande do Sul (Southern Brazil) in 2006. The outcome "amphetamine use" was categorized as "yes" or "no". Poisson regression analysis with robust variance was conducted in order to select variables that would be included in the model, which was composed of variables regarding socioeconomic and demographic characteristics, information on profession and on alcohol consumption.

**RESULTS:** Amphetamine was used by 12.4% of truck drivers in order to stay awake, either by itself or together with other substances (coffee, guaraná powder, energy drinks, snorted cocaine). Amphetamine was the most cited substance by those who consumed something to stay awake. Consumption of alcoholic drinks was mentioned by more than 70% of the interviewees. Among those who declared drinking alcohol, 45.1% reported drinking at least once a week. Amphetamine use was associated with younger age, higher income, longer trips, and alcohol use.

**CONCLUSIONS:** Truck drivers' higher income implies increased workloads, which can result in physical and emotional stress, with consequent use of stimulants, as a temporary solution. The reduction in abusive consumption of alcohol and in the use of illicit substance, like amphetamines, by truck drivers depends not only on policies addressing prevention and treatment for drug abuse, but also on integrated policies ensuring better working and health conditions.

**DESCRIPTORS:** Transportation. Occupational Risks. Amphetamine. Men's Health. Occupational Health. Health Surveys.

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## INTRODUCTION

More than 4 million people work in the transport sector hauling goods or animals in Brazil, corresponding to, 4.8% of all people working in the country.<sup>1,4,a,b</sup> The national vehicle fleet has more than 1.9 million trucks.<sup>c</sup> The exact number of truck drivers is unknown, but it is estimated that more than one million people work in road haulage. Data from National Land Transport Agency (ANTT

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<sup>b</sup> Confederação Nacional do Transporte. Relatório: o perfil sócio-econômico e as aspirações dos caminhoneiros no país. Brasília; 1999

<sup>c</sup> Boletim Estatístico CNT 2009. Brasília (DF): Confederação Nacional do Transporte; 2009.

Available from: <http://www.cnt.org.br/Imagens%20CNT/PDFs%20CNT/Boletim%20Estad%3%ADstico/BoletimEstatistico.2009.pdf> Access in January 2010. The reports are available at [http://www.cnt.org.br/Paginas/Boletins\\_Detalhes.aspx?b=3](http://www.cnt.org.br/Paginas/Boletins_Detalhes.aspx?b=3)

–*Agência Nacional de Transportes Terrestres*) point to the existence of almost 700 thousand truck drivers who are autonomous professionals or work in cooperatives.<sup>18</sup>

Data from *Instituto Brasileiro de Geografia e Estatística* (IBGE – Brazilian Institute of Geography and Statistics) indicate that the Brazilian Land Transport Sector is a male universe, in which 93% of workers are male who work specially in road haulage,<sup>d</sup> mainly in the Southeast and South of Brazil.<sup>18</sup>

Some characteristics of the truck driver's professional activity are common in different countries: the work is executed with the same instruments and techniques and requires skilled driving. Truck drivers form a population with great mobility (and with well-defined mobility patterns, due to their organization around specific routes). They remain during variable periods of time in transit, away from home and have long workdays.<sup>d</sup> This population presents sleep disorders<sup>5,15,16</sup> and the daily routine is described as tiresome, monotonous and lonely.<sup>8</sup>

Working conditions put truck drivers in dangerous situations, for example accidents on highways and robberies, which make them be in constant vigilance.<sup>e</sup> Therefore, truck drivers' working conditions can be considered dangerous and stressful.

These working conditions may lead them to feel isolated and lonely. Truck drivers stay many days or weeks away from home, sleeping on the highway (in their trucks or in external accommodations), which generates tension and conflicts with their families. Incentives or pressure on part of the companies contribute to the driver having long workdays and remaining long periods without sleeping.<sup>f</sup>

Truck drivers present high consumption of cigarettes, alcohol and caffeinated beverages, besides amphetamines in different countries<sup>7-9,14,20,d</sup> A market of specific services and products has been created to meet the demand of a large amount of men who stay long periods away from home – a market that offers sexual services and licit and illicit substances, both to stay awake and for recreational use, among other things.<sup>8</sup> Truck drivers' vulnerability to the AIDS epidemic, in its individual, social and programmatic dimensions, has been discussed by national and international agencies and researchers.<sup>d</sup> It is possible to say that truck drivers are vulnerable in social terms, given the few material and symbolical resources that they have and their restricted access to goods and to health, education, work and leisure services and equipment.<sup>1</sup>

In view of this scenario of vulnerability imposed by truck drivers' working conditions, the present paper aimed to analyze the factors associated with their use of substances to stay awake.

## METHODS

A survey with 854 drivers was carried out at eight truck stops (seven gas stations and one border patrol post) located at five cities in the State of Rio Grande do Sul (Southern Brazil) in 2006.

A qualitative study was conducted in order to investigate the number of trucks that circulated and remained parked at different establishments. The context of the present research involved eight truck stops (seven gas stations and one border patrol post) located in five municipalities of the State of Rio Grande do Sul (Southern Brazil): Chuí, Rio Grande, Canoas, Gravataí and Porto Alegre.

For quantitative stage, the sample of truck drivers was estimated based on a pilot study that registered an average of 3,590 trucks per day at the researched venues. The sample was calculated with maximum error of 5% and confidence interval of 95%, and resulted in 847 truck drivers, with an estimate 10% loss. We used a nonprobability process per quotas established by shift and by drivers' circulation places inside the gas stations (parking lot, carriers, restaurant, mechanic services, among others) for sample selection, as there are no records of the researched population.

A pilot study was carried out with 58 drivers, using a questionnaire designed by the researchers based on the results of the qualitative stage, and on the review of similar studies conducted with drivers. The survey was performed with the same instrument tested in the pilot project. Final sample was composed by 854 drivers, exceeding the number that had been initially estimated for the sample. Information was collected using questionnaires. No biological material was collected for laboratory analysis.

Data were systematized in a database using Sphinx Léxica<sup>g</sup>, with double entry and subsequent comparison and database cleaning.

The outcome was the driver's use of a substance to stay awake. If the interviewee declared having used any, he was asked about what substance he had used. The

<sup>d</sup> Leal A. "No peito e na raça": a construção da vulnerabilidade de caminhoneiros. Um estudo antropológico de políticas públicas para HIV/AIDS no Sul do Brasil [tese de doutorado]. Porto Alegre Universidade Federal do Rio Grande do Sul; 2008.

<sup>e</sup> Sena MFM. As condições e causas dos acidentes de trabalho dos caminhoneiros [dissertação de mestrado]. Rio de Janeiro. Universidade Federal do Rio de Janeiro; 2005.

<sup>f</sup> Douglas E. Putting on the brakes: preventing HIV transmission along truck routes. a research-based field resource supported by the synergy APDIME toolkit. Washington: University of Washington; 2000 [cited 2006 May 01]. Available from: [http://pdf.usaid.gov/pdf\\_docs/PNACW331.pdf](http://pdf.usaid.gov/pdf_docs/PNACW331.pdf)

<sup>g</sup> Sphinx Brasil. Sphinx Léxica [software]. Canoas; 1997.

question used to compose the outcome was: “Do you currently use anything to stay awake?” (yes; no; did not answer; does not know/does not remember). Those who answered yes were asked a stimulated multiple answer question “What do you usually take to stay awake?” [amphetamines; caffeine (coffee, mate [*chimarrão*], coca-cola); guaraná in powder, energy drink (*red-bull*, *bad-boy*), snorting cocaine and other (the interviewer wrote in full the answer that was given)]. The variable for the analysis was “Use of amphetamines to stay awake?” (yes; no).

PAWS software, version 18,<sup>h</sup> was used in statistical analysis. A descriptive analysis of the sample was performed, as well as univariate analysis using Poisson regression with robust variance, in order to select the variables that would be included in the model, by means of the modification of the likelihood ratio ( $p < 0.20$ ). The model was composed by socioeconomic and demographic variables and information on the profession and on alcohol consumption (Tables 1, 2 and 3). The variables that were significant were included in a multivariable model, while variables with  $p > 0.05$  were excluded from the model, while variables with at least one category with  $p < 0.05$  in the Wald test were considered statistically significant associated with the outcome.

## RESULTS

The majority of the interviewees declared to be white, aged 30 to 49 years and with complete primary education. Approximately one fourth of the truck drivers received up to 3.3 minimum salaries, while more than one fourth had income higher than 6.7 minimum salaries. This income was the main source of the family budget for the major part of the interviewees. The majority of them declared that they were married (or living with a partner) and had one or two children. A significant portion (19.4%) stated not having any religious practice, but the majority declared that they had a religion (Table 1).

A large part had had another profession before (78.5%) and the majority (60.2%) did not own the truck they drove (employee or autonomous professional) (Table 2). Autonomous drivers needed to negotiate a load (and the value of the freight) with carriers in each destination at which they arrived. Drivers traveled alone (88.1%) and the majority (66.5%) had some family member who was also a truck driver. The trip lasted approximately one week (mean 6.7 days, standard deviation 7.7, median 4.0) and a few drivers made long trips (5.5% stayed between 15 and 90 days on the road) (Table 2).

The use of some substance to stay awake was reported by 23.0% of the interviewees. Amphetamine was the main

**Table 1.** Truck drivers' socioeconomic and demographic characteristics. Rio Grande do Sul, 2006

Variables	n	%
Race/Skin Color		
White	693	81.2
Black or mixed-ethnicity (black and white)	116	13.6
Others	44	5.2
Age (years)		
20 to 29	163	19.1
30 to 39	247	28.9
40 to 49	245	28.7
50 or older	199	23.3
Level of schooling		
Complete primary school	590	69.2
Complete secondary school / complete or incomplete higher education	263	30.8
Monthly income (minimum salaries) <sup>a</sup>		
1 to 3.3 (312 reais)	200	23.5
3.4 to 5	247	29.0
5.1 to 6.7	171	20.1
6.8 or more	233	27.4
Marital status		
Married or in a union	716	83.8
Single/separated/divorced/widowed	138	15.1
Has children		
Yes	724	84.9
Number of children		
One	198	23.2
Two	281	32.9
Three	163	19.1
Four or more	212	24.8
Had all children with the same woman?		
Yes	461	85.9
Has some religious practice		
Yes	687	80.6
Type of religion		
Catholic	570	66.9
Evangelical	83	9.7
Others	34	4.0
Does not practice/none	165	19.4

<sup>a</sup> The minimum salary at the time the data were collected was R\$300.00 (Law 11164/2005, 04/22/2005, DOU).

substance consumed, mentioned by 106 truck drivers, in isolation or combined with other substances (coffee, guaraná powder, energy drinks and snorted cocaine). The consumption of alcoholic drinks was mentioned by more than 70% of the interviewees; 45.1% reported that they used alcohol at least once a week (Table 3).

<sup>h</sup> Statistical Product and Service Solutions. PAWS statistics 18 [software]. Chicago; 2009.

**Table 2.** Truck driver professional traits. Rio Grande do Sul, 2006.

Variables	n	%
Has already had another profession		
Yes	670	78.5
Owner of the truck		
Yes	340	39.3
Type of employment		
Employee	474	55.5
On his own/autonomous	340	39.8
Other	40	4.7
If the truck is tracked by satellite		
Yes, always	205	24.1
Yes, sometimes	37	4.3
No	611	71.6
What he earns is the main source of income of the family		
Yes	734	86.3
Has some family member who is a truck driver		
Yes	586	66.5
Who is the family member who is a truck driver*		
Brother/son	332	35.4
Father	256	27.2
Uncle/brother-in-law/nephew	243	26.0
Other	107	11.4
Travels alone		
Yes	752	88.1
With whom does he travel*		
Wife	66	55.9
Other family member	21	17.8
Other person	18	15.3
Truck driver	13	11.0
Duration of trips in days		
Up to 2 days	235	27.6
From 3 to 4 days	199	23.4
From 5 to 8 days	225	26.4
More than 9 days	193	22.6

\* Question of multiple answers, percentage calculated on the total of quotations

Use of amphetamine was associated in univariate analysis with self-reported skin color, age, income, marital status, having children, attending a religion and which religion, having another profession, trip duration and alcohol consumption (Table 4). The association amphetamine use and younger age, higher income, longer trips and alcohol consumption remained in the multivariable model (Table 5).

## DISCUSSION

The conditions for being a professional truck driver are possibly related to the use of stimulants. The majority of

**Table 3.** Characteristics of the reported consumption of licit and illicit substances by truck drivers. Rio Grande do Sul, 2006.

Variables	n	%
Uses alcoholic drink		
Yes	623	73.1
Number of times in which he used alcoholic drinks in the last month		
Everyday	83	13.3
At least once a week	281	45.1
Sometimes	259	41.6
Current use of substance to stay awake		
Yes	196	23.0
Substances he usually takes to stay awake*		
Amphetamines	106	36.2
Caffeine (coffee, mate [chimarrão], coca-cola)	126	43.0
Guaraná in powder	23	7.9
Energy drinks (red-bull, bad-boy)	33	11.3
Snorted cocaine	3	1.0
Others (cigarette)	2	0.7
Has used or uses injected cocaine		
Yes	3	0.4

\* Question of multiple answers, percentage calculated on the total of quotations

the interviewees did not report the use of any substances to stay awake, but almost one fourth mentioned the use of some substance, mainly amphetamine.

The high use of amphetamines among truck drivers has been indicated in other studies. Souza et al<sup>17</sup> found a prevalence of 11.1% among Brazilian truck drivers, findings that are similar similar to ours (12.4%). Leyton et al<sup>7</sup> tested urine samples and found a prevalence of 5.8% for amphetamines among truck drivers on the highways of the State of São Paulo. In the present study, 16.6% of the interviewees stated having used amphetamines at least once in their lives, and 7.5% reported regular use of amphetamines to stay awake. Silva et al<sup>14</sup> detected the presence of amphetamines in truck drivers' urine in Southeast, Northeast and South of Brazil, with prevalence of 4.8%. The highest prevalence was observed in the South (6.0%) and the lowest, in the Northeast (3.7%).

Studies with urine testing involved drivers circulating on highways, while our research was conducted with drivers at truck stops (where those who work in an autonomous way tend to concentrate). The higher prevalence of amphetamine use among drivers who have stopped somewhere compared to drivers circulating on highways may be explained by the greater diversity of working conditions among drivers who are in circulation. The most cited substance in this study was amphetamine. Amphetamine was also the most present drug among the positive samples for drugs in

**Table 4.** Univariate analysis of the association between predictors and amphetamine use by means of Poisson regression with robust variance.<sup>a</sup> Rio Grande do Sul, 2006.

Variables	Univariate analysis	
	PR	95%CI
Race/skin color		
White	1	
Black or mixed-ethnicity (black and white)	1.00	0.94;1.06
Others	1.05	0.96;1.16
Age (years)		
20 to 29	1	
30 to 39	0.93	0.87;0.99
40 to 49	0.89	0.84;0.95
50 or older	0.84	0.79;0.89
Income (in minimum salaries <sup>b</sup> )		
1 to 3.3	1	
3.4 to 5	1.04	0.99;1.10
5.1 to 6.7	1.08	1.02;1.14
6.8 or more	1.08	1.02;1.14
Marital status		
Married or in a union	1	
Single/separated/divorced/widowed	1.07	1.01;1.13
Has children		
No	1	
Yes	1.09	1.03;1.16
Practices religion		
Yes	1	
No	1.05	0.99;1.09
Type of religion		
Catholic	1	
Evangelical	0.99	0.93;1.06
Others	1.07	0.95;1.20
Does not practice/none	0.96	0.92;1.00
Had another profession		
No	1	
Yes	1.04	0.99;1.09
Duration of trips in days		
Up to 2	1	
From 3 to 4	1.05	0.99;1.11
From 5 to 8	1.06	1.01;1.12
9 days or more	1.07	1.02;1.13
Uses alcoholic drink		
No	1	
Yes	1.06	1.02;1.11

<sup>a</sup> The variables that were not significant in the univariate analysis ( $p > 0.20$ ) were excluded from the table.

<sup>b</sup> The minimum salary at the time the data were collected was R\$300.00 (Law 11164/2005, 04/22/2005, DOU).

**Table 5.** Multiple analysis to verify the association between predictors and amphetamine use, by means of Poisson regression with robust variance.<sup>a</sup> Rio Grande do Sul, 2006.

Variables	Multiple analysis	
	PR	95%CI
Age (years)		
20 to 29	1	
30 to 39	0.92	0.87;0.99
40 to 49	0.88	0.83;0.94
50 or older	0.83	0.78;0.88
Monthly income (minimum salaries) <sup>b</sup>		
1 to 3.3	1	
3.4 to 5	1.05	0.99;1.10
5.1 to 6.7	1.07	1.02;1.12
6.8 or more	1.09	1.04;1.15
Duration of trips (days)		
Up to 2	1	
From 3 to 4	1.05	0.99;1.10
From 5 to 8	1.07	1.02;1.12
9 days or more	1.07	1.01;1.13
Uses alcoholic drink		
No	1	
Yes	1.06	1.02;1.10

<sup>a</sup> The variables that were not significant in the multiple analysis ( $p > 0.05$ ) were excluded.

<sup>b</sup> The minimum salary at the time the data were collected was R\$300.00 (Law 11164/2005, 04/22/2005, DOU).

two studies with laboratory tests.<sup>7,14</sup> Our research did not involve laboratory tests.

According to Ferreira et al,<sup>4</sup> 69.8% of the interviewed truck drivers used amphetamines during their lives and 39.1% used it in the year in which the research was conducted. In the study carried out by Teles et al,<sup>19</sup> the prevalence of amphetamine use was of 30%. In the work of Silva-Júnior et al,<sup>13</sup> 35% of the interviewees reported using stimulants, of whom 90.6% reported consumption of these substances by their colleagues. In these three studies, the prevalence that was found is higher than in the present research. It should be highlighted that in two of the studies<sup>4,19</sup> the sample was composed of long distance drivers, who therefore stay away from home during longer periods of time, in conformity with our data. In addition, data collection instrument, its application and form of measuring amphetamine consumption were not the same in the three studies, as there were interviews and self-administered questionnaires, as well as questions about consumption some time in life, in the previous year or without specifying time frame.

Consumption of amphetamines by professional drivers is higher than consumption in the general population. A study with drivers in general<sup>3</sup> on the margin of Australian highways found a prevalence of

amphetamine use of 1.4%, a value that is similar to the one found in the United States with victims of accidents on highways (1.1%).<sup>6</sup>

Alcohol consumption is a recurrent practice among the interviewees: 73.1% reported alcohol consumption in the 30 days that preceded the interview. This consumption may be related to characteristics of the profession: being fundamentally male; having as “stops” places where alcohol consumption is favored, like gas stations with restaurants and convenience stores, and bars which are located nearby; being carried out in a solitary way (the majority of the interviewees travel alone).

Other studies have found prevalence rates that were similar to the present one (45.1% consumed alcoholic drinks regularly – at least once a week in the previous month). Souza et al<sup>17</sup> observed that 50.9% of the Brazilian truck drivers consumed the substance regularly. Penteado et al<sup>12</sup> identified a prevalence of 43% of alcohol use in the Northeast of Brazil. In the study conducted by Silva-Júnior et al,<sup>13</sup> carried out in the city of Fortaleza (Northeastern Brazil), 48.3% of the interviewees reported consuming alcohol during workdays and 88.6% reported that their colleagues maintained this practice. Ferreira et al<sup>4</sup> showed that 41.9% of the truck drivers who traveled along routes in the interior of the State of São Paulo reported using alcohol in the seven days that preceded the research.

Amphetamine use and alcohol use have important implications to public health, both in relation to truck drivers' health and to the risk of traffic accidents.<sup>7</sup> Besides the risks inherent in the drugs themselves, the use of amphetamines and alcohol among truck drivers is related to the practice of unprotected sex, greater infection by sexually transmitted diseases (STD) and higher risk of depression.<sup>4,8,13,19</sup>

Truck drivers are a group that has a low-level of schooling, but whose remuneration is higher than national average.<sup>1</sup> The profession of truck driver seems to depend more on a network of family relations than on level of schooling.

The truck drivers' working conditions are precarious. The majority of drivers does not own the truck and an important portion state that they work “on their own” or in an autonomous way. This probably causes an increase in the workday and restricts labor rights (holidays, thirteenth salary,<sup>j</sup> among others). A similar situation is reported by Penteado et al:<sup>12</sup> in which more than half of the interviewees (59.5%) are autonomous and work an average of 12.7 hours per day, which has important implications for health and quality of life. Silva-Júnior et al<sup>13</sup> also found 51.3% of autonomous professionals with a workday of

more than ten hours per day (information reported by 68.6% of the interviewees). However, the truck drivers who have formal jobs also present long workdays, according to that study. Silva et al<sup>14</sup> describe that the drivers are young, they own the truck, and have workdays of ten to 14 hours per day. National and international studies have shown the relationship between drivers' working conditions and increased risk for cardiovascular and musculoskeletal diseases.<sup>10,11</sup> Drivers' fatigue has been pointed as one of the main risk factors for accidents on highways. In our research, staying more days away from home while working is associated with amphetamine consumption.

Amphetamine consumption is associated with higher income, which suggests that increased remuneration implies an increase in the workload. More work, in turn, produces physical and emotional stress, leading the drivers to search for a temporary solution for this problem in amphetamine consumption. The association of amphetamine consumption with the younger age groups indicates that these are more vulnerable, possibly as a consequence of their reduced experience in the profession, which causes more difficulty in dealing with work pressures. Greater vulnerability of young truck drivers is highlighted by Leyton et al<sup>7</sup> and by Silva et al,<sup>14</sup> who have shown higher prevalence of drug use in young drivers, as well as higher risk of depression (Silva-Júnior et al).<sup>13</sup>

This scenario should be understood within a broader context, characterized by low-level of schooling, long periods truck drivers stay away from their homes and families and precarious working conditions, as poor conditions of the highways and of the places where they stay during their trips (gas stations, customhouses, companies' yards). Professional drivers are hired per freight, so the form and value of the payment (per task and load) stimulate long workdays (aiming at reducing delivery time) and individual work (avoiding costs with another driver in the same vehicle).

The heavy workload, combined with the lack of any offer of health and education services and few leisure options at the places in which they remain parked favor the consumption of substances to stay awake, like amphetamines, alcohol and other drugs. The truck drivers are in a situation of vulnerability deriving from their working conditions, gender imperatives, restricted social and cultural opportunities, and from the absence of specific programs and policies that meet their health and education needs. According to the theoretical benchmark of vulnerability,<sup>2</sup> in its individual, social and programmatic dimensions, truck drivers are more susceptible to health problems like STD and HIV infection and regular use of amphetamines, alcohol and other drugs.

<sup>1</sup> Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional por Amostra de Domicílios -PNAD 2007 Brasil. Síntese de Indicadores. Brasília; 2007

<sup>j</sup> Brazilian labor laws require employers to pay a 13th month salary at the end of the year to all regular employees.

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