Age, gender, alcohol, and traffic accidents in Brazil

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According to the World Health Organization's Global Report Status Report on Road Safety 2015, more than 1.2 million people die every year on the roads around the world, most of them living in poor countries. And most of these traffic deaths are predictable and could be prevented with relative ease, with proper policies
(e.g., speed reduction in urban areas) and greater use of public transportation (WHO, 2015).

Take Brazil, for instance: despite the recent adoption of a series of measures to improve road safety, it registered more than 46,000 deaths due to traffic accidents in 2013 (23.4 per 100,000 inhabitants), the third highest death rate in the Americas, after the Dominican Republic (29.3) and Belize (24.4).

Some factors associated with traffic accidents

Young male drivers are notoriously exposed to high risks of traffic accidents (Murillo-Zamora 2017), and more than 75% of victims belong to this category (World Health Organization 2013). Incidentally, this means that, beyond the moral suffering, there is also a high economic cost to pay: individuals who are in their most productive years, even when they do not lose their lives, may be seriously injured, and sometimes permanently disabled.

Belonging to a low socio-economic class is another factor that increases the traffic accident risk (Malta et al 2016).

And then, of course, there is alcohol consumption: most traffic accidents are linked to the presence of alcohol in the driver's blood (Adura, Jorge, 2013; WHO, 2015). Drinking and driving is associated, among other things, with dangerous behaviors such as speeding and non-use of seat belts. Only 49% of countries around the world have national laws that set a legal blood alcohol limit for drivers, Brazil being among them (with a maximum allowed of

0.05g/dl). Although the proportion of adult drunk drivers is tending to decrease, this bad habit is still frequent.

Brazil in 2013

Table 1: In the last 12 months, have you been involved and injured in a traffic (car or motorcycle) accident?

	Total	No		Yes		
Selected Factors	**N**	**N**	**%**	**N**	***%***	***CI(95%)***
Age groups						
18 to 29	7 394	6 925	94.0%	469	*6.0%*	*5.08 - 7.17*
30 to 39	7 647	7 310	95.3%	337	*4.7%*	*3.93 - 5.7*
40 to 49	5 401	5 233	97.2%	168	*2.8%*	*2.11 - 3.63*
50 +	5 651	5 556	98.7%	95	*1.3%*	*1.0 - 1.86*
Gender						
Female	9 223	8 992	97.9%	231	*2.1%*	*1.7 - 2.7*
Male	17 531	16 686	95.4%	845	*4.6%*	*4.1 - 5.3*
Education level						
Illiterate/incomplete primary education	6 753	6 477	96.0%	276	*4.0%*	*3.2 - 4.9*
Complete primary/incomplete high school	3 971	3 755	94.9%	216	*5.1%*	*4.1 - 6.3*
Complete high school/incomplete university	10 102	9 665	95.9%	437	*4.1%*	*3.4 - 4.8*
Complete university	5 928	5 781	97.5%	147	*2.5%*	*1.8 - 3.4*
Race/ethnicity						
White and asian	12 796	12 376	96.9%	420	*3.1%*	*2.6 - 3.6*
Black, brown and indigenous	13 958	13 302	95.1%	656	*4.9%*	*4.2 - 5.6*
Region						
North	5 269	4 977	94.1%	292	*5.9%*	*4.7 - 7.4*
Northeast	6 978	6 645	95.1%	333	*4.9%*	*4.2 - 5.8*
Southeast	6 226	6 066	97.0%	160	*3.0%*	*2.3 - 3.9*
South	4 107	3 984	96.5%	123	*3.5%*	*2.6 - 4.7*
Center-West	4 174	4 006	95.2%	168	*4.8%*	*3.9 - 5.9*
Did the respondent drive on any of the days s/he consumed alcohol?						
Yes	2 321	2 134	91.8%	187	*8.2%*	*6.5 - 10.4*
No	7 075	6 787	95.7%	288	*4.3%*	*3.5 - 5.2*

Note: The table refers exclusively to those who reported driving a car or a motorcycle in the previous 12 months. Not everybody answered all the questions of the survey.
Source: PNS, 2013.

Using cross-sectional data, we estimated the factors more closely associated with traffic accidents in Brazil in 2013. Our data come from the National Health Survey (PNS), conducted by the Brazilian Census Bureau (IBGE). PNS is a household survey of complex sample design focusing on the health situation and lifestyles of the Brazilian population (Damacena et al., 2015). In the 2013 round, 26,754 car or motorcycle drivers aged 18 and over where interviewed, of whom 1,076 reported having had a traffic accident with bodily injury in the 12 months preceding the interview. Some descriptive statistics are reported in Table 1.

Among those aged 18-29, approximately 6% reported being involved in a traffic accident in which they suffered personal injury. This percentage decreases with age, down to only 1.3% among those aged 50 and over.

Road traffic accidents are more frequent among men than among women (4.6 vs. 2.1%), among people with low education (4-5%) than among those with a university degree (2.5%), among non-whites than among whites or Asians (4.9 vs. 3.1%), and among those who live in the North Region[1] (almost 6%).

Not surprisingly, those who report driving on the days when they consume alcohol have more frequent accidents than those who do not (8% vs. 4%).

Table 2: Multivariate prevalence ratios (PR) of factors selected for the occurrence of traffic accidents involving car or motorcycle drivers in the previous 12 months, Brazil, 2013

Selected factors	(N=9,221)	
	PR	CI (95%)
Age groups (ref. 18 to 29)		
30 to 39	*0.70**	0.490 - 1.007
40 to 49	*0.52***	0.333 - 0.807
50 +	*0.30***	0.167 - 0.532
Education level (Ref. C. Complete high school/incomplete university)		
A. Illiterate/incomplete primary education	*1.24*	0.830 - 1.838
B. Complete primary education/incomplete high	*1.30*	0.904 - 1.872
D. Complete university	*0.99*	0.591 - 1.654
Region (Ref. Southeast)		
North	*1.09*	0.646 - 1.837
Northeast	*1.13*	0.733 - 1.751
South	*1.17*	0.732 - 1.855
Center-West	*1.17*	0.754 - 1.826
Race/ethnicity (Ref. White and Asian)		
Black, brown and indigenous	*1.50***	1.056 - 2.143
Gender (ref. Female)		
Male	*1.81***	1.095 - 2.982
Consumed any alcohol on day(s) of driving? (Ref. No)		
Yes	*4.22***	1.980 - 8.998
Gender*Consumed any alcohol on day(s) of driving?		
	*0.37***	0.162 - 0.820

Note. Poisson regression. *=p< 0.10; **=p< 0.05. Red denotes significant variables

Example of how to read the table. Take age, and consider the risk (=prevalence rate) of an accident of a person aged 18-29 years as your standard of reference (=1). Those who are aged 30-39 years appear to have a considerably lower risk, of about =.70, although, because of the uncertainty in the estimate (deriving from the fact that only a relatively small sample of drivers is observed) the "true" relative risk lies probably somewhere between 0.49 and 1.007. (If this interval includes 1, the reference category and this one are basically not distinguishable in terms of accident risks.) Proceed similarly for other age groups of other variables.

Source: PNS, 2013.

Putting all of these variables together leads to the unsurprising results of Table 2, which confirm those already seen in the descriptive Table, except that, because of collinearity, some of the variables become non-significant.

However, both sets of results should be taken with caution. They are in line with previous

studies (Vaca, Romano and Fell, 2014), but not all the variables are defined as precisely as one would wish. For instance, “drinking and driving in the same day” does not refer to a precise period, whereas the dependent variable does (occurrence/non-occurrence of traffic accident in the 12 months prior to the interview); it is not clear whether drinking precedes driving or vice-versa, and how much drinking (and driving, for that matter) is implied; fatal injuries are, by definition, omitted from the picture, etc.

Overall, however, the situation remains worrying, and much remains to be done, including the collection of more refined and more timely statistics to better understand and combat one of the scourges of modern societies, of emerging ones in particular: road traffic accidents.

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Footnote

[1]In Brazil, North and Northeast are the least developed regions. In the North Region, where geographical conditions give special importance to river transportation, roads are generally unsafe and poorly maintained.