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Logit Model for the Determinants of Drug Driving in Ghana

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Abstract The recent rise in the number of road traffic accidents by a report of the Ghana National Road Safety Commission in 2012, calls for a review of drug driving. This study was conducted to assess the use of drugs by commercial drivers in Ghana and to determine the social factors that contribute to drug driving. Drivers of different vehicles like cargo trucks and passenger buses were selected from commercial bus and cargo terminals for the study. A total of three hundred (300) drivers were selected for the study. The determinant factor(s) were selected into the fitted logistic regression model. A five (5) percent statistical significance level is required for a variable to stay in a model. Approximately, 34 percent of the respondents admitted using drug when driving and seventy (70) percent learned how to drive from unapproved driving institutions. There are significant association between drug driving and Educational status, Distance traveled, Time (hours) used in driving by commercial drivers in Ghana.

Keywords Backward regression, Logit model, Odds ratio, Drug Driving, Commercial Drivers

1. Introduction

Drug driving is the action or offense of driving a motor vehicle while under the influence of drugs, especially those that are illegal. Many drugs can affect the physical and mind set necessary to operate a vehicle safely, posing a serious risk to the driver and other road users. Drug slow down physical response and progressively impairs mental functions. A report by the Ghana National Road Safety Commission in 2012 indicated that substance use (Drug) among commercial drivers is one of the most serious challenges confronting the transportation industry in Ghana. The report indicated that, thirteen thousand, five hundred and thirty five (13535) crashes have been recorded resulting over two thousand and sixty nine (2069) deaths. It is therefore important to understand the social determinants of the abuse of these substances in order to reduce the number of accidents on our major roads by commercial vehicle drivers.

A significant number of drivers use stimulants to keep them awake and relieve fatigue during their long journeys.

Despite the existence of laws against drunk driving, the effectiveness of these laws in controlling the problem is questionable.

A study conducted by Mir et al., (2012) to assess usage of alcohol and marijuana in Pakistani commercial drivers.

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This is to identify the associations between driver characteristics and alcohol and marijuana use. Different patterns of usage are seen between population subgroups based on age, ethnicity, education, and marital status. This study is to compare whether or not those prevailing conditions are similar to commercial drivers in Ghana.

In a research conducted by Ahlm et al. (2009) on the prevalence of alcohol in injured Swedish drivers, the result indicated that majority of the fatally injured drivers tested positive to alcohol. However, a research conducted by Verster (2009) on several commercial drivers and their Blood Alcohol Concentration to determine the association between Blood Alcohol Concentration and road traffic accidents for these drivers. A relationship between Blood

Alcohol Concentration and the risk of becoming involved in a road traffic accident existed.

A simulated driving study conducted by Calhoun et al., (2004) reported that a low dose of alcohol may have a protective effect on driving ability. While in France, a study conducted by Mura et al., (2003) found that significant number of the drivers showed a blood alcohol concentration above the legal limit.

Cannabis is to be the next most common drug of abuse found in drivers after alcohol Penning et al., (2010). A study from New Zealand reported that almost twenty one percent of young drivers admitted that they had driven at least once after smoking cannabis. Ferguson et al. (2008). Approximately sixty percent of the inter-viewed Australian nightclub attendees reported that they were driven home by someone under the influence of cannabis or that they drove themselves after smoking cannabis. Degenhardt et al,

(2006).

Overall, marijuana is the most prevalent illegal drug detected in impaired drivers, fatally injured drivers and motor vehicle crash victims. Other drugs also implicated include cocaine, opiates, and amphetamines. Soderstrom et al, (2001). The study is to use a mathematical model to determine whether those conditions are the same in developing countries, especially Ghana.

Studies conducted in the United States found that seventeen percent of the drivers had a Blood Alcohol Concentration (BAC) above the legal limit. Williams (2006). By comparing this figure to the European roadside studies

Gjerde et al., (2008), the percentage is a bit higher. A simulated driving study conducted by Calhoun et al., (2004) reported that a low dose of alcohol may have a protective effect on driving ability.

The objective of the study is to determine the significant contributory factors influencing the use and abuse of substance, the type of substance used so as to make a proposal to reduce the risk of road traffic accidents from such factors.

The study would address the social consequences of substance abuse by commercial drivers, a serious social problem with social and economic costs. Finally, this study would provide guidance to develop effective intervention strategies to address the problem of substance abuse by most commercial drivers.

2. Methodology

2.1. Data Collection and Sampling

An interview-administered questionnaire was used to conduct field surveys on factors that influence the use and abuse of substance by commercial drivers. Informed verbal consent was obtained from each respondent before commencement of interview.

The purposive sampling approach was used to select commercial bus terminals and cargo terminals of some selected regional capitals based on the location of the terminals and the population of vehicles. The selected regional capitals are namely Accra, Ho, Kumasi, Bolga and Tamale. A total of 300 questionnaires were administered equally among the selected regional capitals.

2.2. Statistical Methodology

This section presents the theory of statistical methods used to analyse the factors that contribute to substance use and abuse by drivers in Ghana. The logistic regression is the major tool utilized in this paper. Specifically, the logit version of the binary logistic model is used.

This model is a statistical technique for predicting probability of an event, given a set of independent variables. The objective of Logistic Regression Analysis is to find the best fitting model to show the relationship between a response variable and a set of explanatory variables. Logistic Regression Model has an outcome which is categorical and usually binary (dichotomous) (Chatterjee, et al., 2000).

The Logistic regression model can be expressed as

$$\pi(x) = \frac{\exp(\beta_0+\beta_1(x))}{1+\exp(\beta_0+\beta_1(x))} \quad (1)$$

The logit transformation defined in terms of π(x) is as follows:

$$g(x) = \ln[\frac{\pi(x)}{1-\pi(x)}] \quad (2)$$

This transformation is necessary because g(x) has the properties of a linear regression model. The logit g(x) is linear in its parameters. For a dichotomous outcome we may express the value of the outcome variable x as y= π(x) + ε where ε is the error. The quantity ε may assume one of two possible values. If y = 1, then ε = 1- π (x) with probability 1- π (x), and if y = 0, then ε =- π (x) with probability 1- π (x). Thus ε has a distribution with mean zero and variance equal to π (x) [1 - π(x)]. That is the conditional distribution of the outcome variable follows a binomial distribution with probability given by the conditional mean, π(x). The maximum likelihood method is used to estimate the logistic regression parameters.

Thus the resulting estimators are those that agree most closely with the observed data. If the response variable Y is coded as 0 or 1, then the expression for π(x) given in (1) provides the conditional probability that y=1. That is Pr(Y = 1|x) and this follows that the quantity 1 - π (x) gives the conditional probability that y=0. Thus for the pairs $(x_i\ ;y_i)$ where y_i = 1, the contribution to the likelihood function is π (x_i) and for those pairs where y_i = 0, the contribution to the likelihood function is 1 - π (x_i) (Chatterjee, et al., 2000).

For a binomial response

$$y_i = \begin{cases} 1 \text{ if event occurs} \\ 0 \text{ if event does not occur} \end{cases} \quad (3)$$

In the multiple setting with more than one predictor variable the logistic regression model will take on the following general form;

$$\pi(x) = \frac{\exp(\beta_0+\beta_1x_1+\beta_2x_2+\cdots\beta_nx_n)}{1+\exp(\beta_0+\beta_1x_1+\beta_2\beta_2+\cdots\beta_nx_n)} \quad (4)$$

The odds of occurring can be defined as

$$Odds = [\frac{Y=1}{Y=0} = \frac{\pi(x_1)}{1-\pi(x_1)}] \quad (5)$$

The odds are important to binary data set because they offer a ratio for the chances of an event occurring opposed to an event not occurring (Chatterjee, et al., 2000).

In logistic regression, the comparison of observed to the predicted values is based on the log-likelihood function

$$In\ L(\beta_0\,\beta_1) = \sum_{i=0}^{n} y_1\ [\ln(\pi(x_i)) = (1-y_i)In(1-\pi(x_i)] \quad (6)$$

The comparison of observed to the predicted values using the likelihood function is based on the following expression

$$D = -2\ln\left[\frac{likeli\,hood\ of\ the fulled\ \ model\ /wit hout\ \ variable}{likeli\,hood\ of\ \ the\ saturatedmodel\ \ \ /wit h\ variable}\right] \quad (7)$$

D is called the deviance. It provides a means of comparing the likelihood of the model that has been fit.

The quantity in the bracket is called the likelihood ratio. Using the minus twice its log is necessary to obtain a quantity whose distribution is known and can therefore be used for hypothesis testing purposes such as a test called likelihood ratio test.

D = -2[ln (likelihood of the current model) - (ln (likelihood of saturated model)] (8)

Hosmer and Lemeshow, (1989). The deviance takes the likelihood of the current model where an element of error is present and subtracts the likelihood of the saturated model where there is no error term present and then sums over the difference. To assess the significance of an independent variable, we compare the value of D with and without the independent variable in the equation, the change in D due to the inclusion of the independent variable in the model G is given by: G= Deviance of the model without the variable -Deviance of the model with the variable The statistic G plays the same role in Logistic Regression that the partial F-test does in the linear regression. In this study, the potential explanatory variables were examined to determine whether or not they are significant enough to be used in our models. The complete model contained all the explanatory variables and interactions believed to influence the level of substance abuse. From that initial stage, we performed regression analysis to select our significant variables.

2.3. Model Assumptions

Logistic regression does not assume a linear relationship between the dependent and independent variables, the dependent variables do not need to be normally distributed, there is no homogeneity of variance assumption, in other words, the variances do not have to be the same within categories, normally distributed error terms are not assumed and the independent variables do not have to be interval or unbounded.

2.4. Fitting the Data

Since we fit a logistic regression model, we assume that the relationship between the independent variables and the logits are equal for all logits. The regression coefficients are:

$$\ln\left[\frac{\pi(x_i)}{1-\pi(x_i)}\right] = \beta_0 + \beta_1 x_1 = g(x) \quad (9)$$

The results would therefore be a set of parallel lines for each category of the outcome variables. This assumption can be checked by allowing the coefficients to vary, estimating them and determining if they are all equal (Chatterjee, et al., 2000). So our maximum likelihood parameter estimates, diagnostic and goodness of fit statistics, residuals and odds ratios were obtained from the final fitted logistic regression model.

2.5. Analysing the Data

The logistic regression model was used to select the significant variables that are believed to contribute to substance abuse by drivers. Questionnaire was used identify potential variables that are believed to have a significant influence on substance abuse by commercial vehicle drivers. Logistic regression model was used to select those variables which are significant. Finally, we examined our outcome to determine the fitness of our model and the variables that contribute significantly to our model.

3. Results

Majority of the commercial drivers are between the ages of 31-50 years. All of the respondents were male adults within the active productive age. The distribution also indicates that there are a few people within the ages of 21-30 years and the older from 61 years and above. There are clear indications of a large proportion of a driver population within a responsible age.

Majority of the respondents are Christians and Muslims. Interestingly, both religions frowns on stimulants and anything that would make the brain interpret things abnormally. Approximately, 90 per cent of the commercial drivers come from both religions and yet they are found to abuse drug in one way or the other.

About 59 per cent of the respondents meet the requirement of the Driver and Vehicle Licensing Authority (DVLA) of Basic Education Certificate Examination (BECE). The illiteracy level of the respondents is higher. About 41 percent of the commercial drivers interviewed have never being to school. This is of much concern because interpretation of road signs requires a certain level of basic education. This accounts for the significance or the likelihood of substance use by drivers. Majority of the commercial drivers do not even know the dangers associated with drug driving.

Majority of the commercial drivers (respondents) are responsibly married and constituted approximately 66 per cent of the total respondents. They are breadwinners who provide for the up keep of their families and should care much of road safety. Clearly, this explains why marital status is not a determinant or associated with substance abuse by commercial drivers. There are no association between marital status and the use of drug by commercial drivers.

The type of vehicle a commercial driver uses determines the time spent and the distance expected to cover. Respondents who travel for long hour are mostly those who use trailers and coaches (Long Buses). Generally, the type of vehicle a driver uses does not have direct relationship with the likelihood of drug use. But time spent on a journey influence the likelihood of substance use. This is why those who use trailers and coaches use chemical substances as they usually travel long distances.

Generally, the manner in which commercial drivers learn how to drive is a source of concern for safety.

The table below indicates that nearly 70 per cent do not learn from the approved driving institutions. They either learn how to drive from their friends, family members, self-taught or learning on job. Driving schools do not only teach one how to drive but also on the dangers associated with stimulants and propellants. Safety and safe driving is the priority of every driving institution.

The table below clearly indicates that more than 60 per cent of the respondents used to drive for long hours ranging from 9 hours and above in a single trip. There is a relationship between substance use and hours of continuous driving. Stress and fatigue on the part of the respondents influences the use of some chemical substances. As the illiteracy rate of the respondents is high, they are unaware of the dangers associated with use of these drugs.

Below are the commonest drugs usually administered by commercial drivers in Ghana. In all, 102 respondents admitted to using some drugs as stimulants when driving. This represents 34 per cent of the total respondents.

Table 1. General Information of Drivers

Age (years)	Number of Driver(s)	Percentage
21-30	41	14.0
31-40	92	30.7
41-50	87	29.0
51-60	55	18.0
61+	24	8.0
Religious status	Number of Driver (s)	Percentage
Christianity	135	45.0
Islam	134	44.7
Traditional	31	10.3
Others	0	0.0
Level of Education	Number of Driver(s)	percentage
Never Been to School	123	41.0
Primary/J.H.S	158	52.7
Secondary	19	6.3
Tertiary	0	0.0
Marital Status	Number of Driver(s)	Percentage
Single	49	16.3
Married	197	65.7
Divorced	50	16.7
Cohabiting	4	1.3
Type of Vehicle	Number of Driver(s)	Percentage
Trailer Truck	67	22.3
Coaches/Bus	58	19.3
Cargo truck	75	25.0
Dumper truck	36	12.0
Mini Bus	28	9.3
Taxi	36	12.0
Training	Number of Driver(s)	percentage
Driving School	87	29.0
Family/friends	59	19.7
Learning on job	55	18.3
Self-tutoring	49	16.0
Other	50	16.7
Hours in Driving	Number of Driver(s)	percentage
6	28	9.3
7	24	8.0
8	64	21.3
9	59	19.7
10+	125	41.7

Table 2. Types of Drugs

Name of Drug	Common /Local Name (s)	How administered
Cannabis	Marijuana, Weed, Ganja	Smoke
Opiates (Opium)	Codeine, Morphine, Pethidine	Drink
Volatile inhalants	Spray, Glue, Gases	Inhale
tranquilizers (sedatives)	volume (5, 10), 'Blue-Blue'	Swallow
Cocaine or Heroine	White powder, Brown sugar, 'Crack'	Sniff
Alcohol	'Akpeteshi', Beer	Drink
Amphetamines (Stimulants)	Nescafe, 'Ataya'	Drink
Cola Nuts	'Goro', 'Bissi'	Chew
Cigarette	King Size, 555, Embassy	Smoke

3.1. Logistic Regression Analysis

Table 3 shows the coefficients, their standard errors, the z-statistic (Wald z-statistic), and the associated p-values.

The logistic regression coefficients give the change in the log odds of the outcome for a one unit increase in the predictor variable. For every one unit change in distance travelled (800km), the log odds of drug use (versus not drug use) increases by 5.6288 and for every unit change in 700km, the log odds of drug use verses not use increases by 6.2005.

For a one unit increase in time (9hrs), the log odds of being a drug user increases by 3.3789 and every unit change (7hrs), the log odds of being a drug user increases by 0.9470. Commercial drivers who learn on job, self-taught and learn from friends are statistically significant but driving school is not significant. Marital status is not statistically significant and therefore is not a determinant of drug use. Commercial drivers who travel long distances above 700 kilometres have significant p-values. This means that distance is a significant determinant of drug use by drivers.

3.2. Maximum Likelihood Estimate

3.3. Odds Ratio (OR)

Table 4 shows the output of the odds ratio of the logistic regression model. We are 95 per cent confident that for a one unit increase in time (hours), the odds of drug use by a commercial driver who drives for more than 10 hours versus not using drug increases by a factor of 5.509293e+01. The odd of a commercial driver using a dumper truck is between 2.894950e-01 and 1.353064e+02.

We are 95 per cent confident that for a one unit increase in distance, the odds of drug use by a commercial driver who drives for more than 900 kilometres versus not using drug increases by a factor of 2.008983e+03.

3.4. Analysis of Deviance

The backward elimination regression model-building technique was used to select the significant variable(s) into a fitted logistic regression model. This technique begins with a full model (Model with the entire variables understudy) and deletes variable one after the other until the model begins to degrade. Each deletion of variables from the model is explained in a sequence of Models (Table 5). A 5 per cent statistical significance level is required for a variable to stay in a model.

Table 3. Maximum Likelihood Estimate

Coefficients	estimate	std. error	z value	pr (> |z|)
(Intercept)	-9.5176	2.8415	-3.350	0.000810***
Age[31-40]	-2.5937	1.1842	-2.190	0.028502*
Age[41-50]	-2.4622	1.2467	-1.975	0.048277*
Age[51-60]	-2.0518	1.3342	-1.538	0.124095
Age[61+]	-0.8094	1.2458	-0.650	0.51588
Distance[200]	2.0036	1.8626	1.076	0.282053
Distance[300]	-0.4490	2.3589	-0.190	0.849028
Distance[400]	0.4749	2.2327	0.213	0.831568
Distance[500]	0.9555	2.1976	0.435	0.663724
Distance[600]	2.8958	2.3134	1.252	0.210670
Distance[700]	6.2005	2.2884	2.710	0.006738**
Distance[800]	5.6288	2.2048	2.553	0.010682*
Distance[900+]	7.6054	2.3340	3.259	0.001120**
Education[pri./JHS]	-1.4316	0.5744	-.2.492	0.012692*
Education[Secondary]	-4.6529	1.4413	-3.228	0.001246**
Mstatus[married]	1.4788	1.0258	1.442	0.149406
Mstatus[divorced]	1.6542	1.1288	1.465	0.142801
Mstatus[cohabiting]	-15.0934	1559.8634	-0.010	0.992280
Religion[islam]	0.4423	0.6033	0.733	0.463455
Religion[traditional]	2.4259	0.9491	2.556	0.010591
Time[7]	0.9470	1.6971	0.558	0.576826
Time[8]	2.1849	1.1605	1.883	0.050100
Time[9]	3.3789	1.2721	2.656	0.007903**
Time[10+]	4.0090	1.1156	3.594	0.000326***
Training[friends]	4.7524	0.8723	5.448	5.09e-08***
Training[learning on job]	5.4805	1.0253	5.346	9.01e-08***
Training[self- tutoring]	1.6451	0.8461	1.944	0.051861
Training[other]	0.7260	0.8414	0.863	0.388197
Vehicle[mini bus]	1.0255	1.1606	0.884	0.376900
Vehicle[dumper truck]	1.6553	1.5397	1.075	0.282337
Vehicle[cargo truck]	-1.3082	0.7798	-1.678	0.093430
Vehicle[coaches]	0.6760	1.9613	0.345	0.730355
Vehicle[taxi]	1.2415	1.5229	0.815	0414950

Table 4. Odds Ratio

variable	or	2.5 %	97.5 %
(intercept)	7.354505e-05	1.428725e-07	1.121890e-02
Age [31-40]	7.474196e-02	6.577162e-03	7.091162e-01
Age [41-50]	8.524946e-02	6.531945e-03	9.100546e-01
Age [51-60]	1.285092e-01	8.534147e-03	1.683472e+00
Age [61+]	4.451276e-01	3.460478e-02	4.824807e+00
Distance [200]	7.415634e+00	2.332663e-01	4.701014e+02
Distance [300]	6.382445e-01	4.814157e-03	7.583486e+01
Distance [400]	1.607809e+00	2.433147e-02	2.136692e+02
Distance [500]	2.599846e+00	3.893110e-02	2.136692e+02
Distance [600]	1.809758e+01	2.624222e-01	2.632232e+03
Distance [700]	4.930109e+02	9.634342e+00	8.423085e+04
Distance [800]	2.783408e+02	6.355358e+00	4.002675e+04
Distance [900+]	2.008983e+03	3.548114e+01	3.683694e+05
Education [pri./JHS]	2.389364e-01	7.227582-02	7.044533e-01
Education [Secondary]	9.533762e-03	3.869645e-04	1.147145e-01
Mstatus [married]	4.387837e+00	6.140997e-01	3.521826e+01
Mstatus [divorced]	5.228772e+00	5.852233e-01	5.030545e+01
Mstatus [cohabiting]	2.786201e-07	5.652233e-01	9.621607e+29
Religion [islam]	1.556342e+00	4.807932e-01	5.267230e+00
Religion [traditional]	1.131217e+01	1.897967e+00	8.108981e+01
Time [7]	2.578066e+00	8.673554e-02	7.682196e+01
Time [8]	8.889540e+00	1.039258e+00	1.058949e+02
Time [9]	2.933885+01	2.825415e+00	4.539337e+02
Time [10+]	5.509293e+01	7.644572+00	6.543038e+02
Training [friends]	1.158582e+02	2.418215e+01	7.684636e+02
Training [on job]	2.399782e+02	3.893176e+01	2.264460e+03
Training [self tutoring]	5.181556e+00	1.023111e+10	2.937798e+01
Training [other]	2.066831e+100	3.862077e-01	1.101892e+01
Vehicle [mini bus]	2.788545e+00	3.074893e-01	3.069662e+01
Vehicle [dumper truck]	5.234497e+100	2.894950e-01	1.353064e+02
Vehicle [cargo truck]	2.703109e-01	5.435443e-02	1.201289e+00
Vehicle [coaches]	1.965929e+00	3.906809e-02	9.421414e+01
Vehicle [taxi]	3.460717e+00	2.210596e-01	9.827966e+01

From Table 5 the respective values of the AIC for Model 1, model 2, model 3, and model 4 are 187.91, 186.54, 187.10 and 185.26. Based on these statistics, model 4 with AIC value of 185.26 is the least among the competing models, hence selected as the best model. From this model, Level of education with (p-value=3.114e-05 ***), time used to drive with (p-value=0.0005852 ***) mode of training with (p-value=2.2e-16 ***) and distance travelled with (p-value=2.2e-16 ***) were the most significant variables associated with the use of drug by commercial drivers.

The remaining variables such as age, religion and type of vehicle used were not significant.

Table 5. Analysis of Deviance

Variable	Df	Deviance	Resid. Df	Resid.Dev	P(>|Chi|)
	MODEL 1 AIC = 187.91				
NULL				299	384.62
Age	4	0.457	295	384.16	0.9775398
Distance	8	114.079	287	270.09	<2.2E-16***
Education	2	20.754	285	249.33	3.114E-05***
Mstatus	3	8.326	282	241.01	0.0397362
Religion	2	3.673	280	237.33	0.1593930
Time	4	19.651	276	217.68	0.0005852***
Training	4	88.100	272	129.58	<2.2E-16***
Vehicle	5	7.668	267	121.91	0.1754806
MODEL 2 AIC = 186.54					
NULL				299	
Distance	8	113.542	291	271.08	<2.2E-16***
Education	2	20.006	289	251.07	4.525E-05***
Mstatus	3	8.084	286	242.99	0.0443135*
Religion	2	3.035	284	239.95	0.2193018
Time	4	20.918	280	219.04	0.0003287***
Training	4	82.593	276	136.44	<2.2E-16***
Vehicle	5	7.902	271	128.54	0.1616969
MODEL 3 AIC = 187.10					
NULL					384.62
Distance	8	113.542	291	271.08	<2.2E-16***
Education	2	20.006	289	251.07	4.525E-05***
Mstatus	3	8.084	286	242.99	0.0443135*
Time	4	21.594	282	221.40	0.0002414***
Training	4	80.134	278	141.26	<2.2E-16***
Vehicle	5	8.158	273	133.10	0.1477385
MODEL 4 AIC = 185.26					
NULL				299	384.62
Distance	8	113.542	291	271.08	<2.2E-16***
Education	2	20.006	289	251.07	4.525E-05***
Matatus	3	8.084	286	242.99	0.0443135*
Time	4	21.594	282	221.40	0.0002414***
Training	4	80.134	278	141.26	<2.2E-16***

3.5. Test of Overall Fitness of the Fitted Model

The measure of how well our model fit is the significance of our overall model. We test for whether our model with predictors fits significantly better than our model with just an intercept (null model). The chi-square of 121.91 with 267 degrees of freedom and an associated p-value of 7.093043e-16 which is less than 0.005 tells us that our model as a whole fits significantly better than an empty model.

Table 6. Overall fitness of the model

Test	Value	DF	P_Value
Chi-Square	121.91	267	7.093043e-16

4. Conclusions

The results obtained from the logistic regression model revealed that drug driving among commercial drivers in

Ghana was strongly associated with educational levels, type of vehicle used, distance travelled and time (hours) used to drive. A number of the commercial drivers admitted to using some chemical substances (drugs) before driving.

Thirty four (34) per cent of the commercial drivers admitted to using chemical substances to either enhance their performance or to keep them awake for long hours of continuous driving. About sixty (60) per cent of the commercial drivers usually drive for more than nine (9) hours in a trip. There are significant relationship between substance use and hours of continuous driving. The most widely used substances (drugs) among commercial drivers in Ghana are Marijuana which is popularly known in the Ghanaian community as 'Wee', Alcohol which is also commonly called 'Akpeteshi' and Stimulants like Nescafe and 'Ataya'.

Urgent attention needs to be taken by policy makers to remedy the situation. The Ghana National Road Safety Commission should make a comprehensive assessment of the risk factors associated with the driver working conditions which contribute to road traffic accidents in the country.

The ministry of roads and transport in collaboration of the Ghana Private Road Transport Union (GPRTU) which is the main transport union in the country should organise regular seminars on the dangers associated with Drug Driving.

The Motto Traffic Transport Unit (MTTU) of the Ghana Police Service should strengthened their regular checks on the major highways for over speeding and Drug Driving.

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List of Abbreviations

GNRSC: Ghana National Road Safety Commission.
GPRTU: Ghana Private Road Transport Union.
MTTU: Motor Traffic Transport Unit.
DVLA: Driver and Vehicle Licensing Authority.
BECE: Basic Education Certificate Examination.
BAC: Blood Alcohol Concentration.

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