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## **Substance Use and Perceived Consequences on Health and Safety among Commercial Motorcyclists in Ibadan North Local Government, Ibadan, Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Authors CMN and OBN designed the study, collected data, performed statistical analysis with the aid of a statistician. Authors CMN, OBN and EU wrote the first draft of the manuscript. Authors CMN and EU managed the analyses of the study. Authors CMN, OBN and EU managed the literature searches. All Authors read and approved the final manuscript.*

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### **ABSTRACT**

**Introduction:** Motorcycling is a globalized mode of transport patronized by many road users especially in Nigeria. Although, fraught with negative health outcomes. This study sought to access the perceived consequences of substance use on health and safety among commercial motorcyclists in Ibadan, Nigeria.

**Design and Method:** Using a cross-sectional survey design, registered and consenting eighty commercial motorcyclists were recruited. A 39 item, interviewer-administered questionnaire containing motorcyclists' demographic characteristics, perceived consequence of substance use, behaviour towards substance use and consequences of substance use was used to obtain information. Collected data was analyzed at  $p \leq 0.05$  of

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significance.

**Results:** The respondents were mainly within 30-39 years (36.3%); previously traders (42.5%) and have attained secondary school level of education (45.0%). Though, 57.5% of the respondents positively affirmed the ability of an individual under the influence of alcohol to cause accident, 46.3% of them hold the belief that it is good for mood modification and did not affect health negatively (70%). Up to 36.2% of the respondents agreed to have used substances while driving. Enhancement of visibility while driving (51.3%), relaxation (47.5%) and assists in forgetting problems (42.5%) were reasons given by motorcyclists for this. Fifty percent of the motorcyclists have been involved in a fatal accident. There no significant association between educational level and perception about substance use at  $p=0.258$  but association between perception on substance use and age of respondents was significant at  $p=0.05$ . The Perception and Behavior of motorcyclists' Riders were significantly different at  $p= 0.04$ .

**Conclusion:** Although, the respondents know that substance use had some negative consequences, yet many still indulged in it even when on duty. Positive behavioural change interventions should be implemented among motorcyclists.

*Keywords: Perception; consequences; substance use; health; commercial motorcyclists.*

## 1. INTRODUCTION

Globally, deaths and injuries resulting from road crashes are a major and growing public health problem [1]. More than 20 million people are severely injured or killed on the world's roads each year and the burden falls most heavily on low-income countries in Africa, Latin America and Asia who are used to bicycles and motorcycles as means of transportation [1]. Per vehicle mile traveled, motorcyclists have a 34-fold higher risk of death in a crash than people driving other types of vehicles [2]. Their mortality rate in the United Kingdom (UK) per million vehicle kilometre is approximately twice that of pedal cyclists and over 16 times that of car drivers and passengers [3]. Generally, motorcycle riders are less protected from accidents and they are at greater risk than drivers and passengers of cars and motor vehicles [1]. About 70-90% of road deaths in Thailand and 60% in Malaysia were reportedly among users of motorized two wheelers [3].

Motorcyclists constitute an important group of road users globally [3]. In the Taiwan Province of China, an increase in the use of motorcycles was reportedly associated with increasing deaths and injuries. Similarly, a study in Brazil reported that, motorcyclists had an eight-fold risk of dying, a four-fold risk of injury and a twofold risk of running over pedestrians as compared to automobile drivers [1]. In many developing countries, motorcycles are an increasingly common means of transport which emerged as a result of the obvious inability of most nations to adopt an enduring public transport policy as a major mode of transport [4]. In India, for instance, 69% of the total number of motor vehicles is motorized two- wheelers and in Vietnam, the number of motorcycles has grown from 500,000 to 10,000,000 in the past 10 years [3]. In Nigeria, commercial motorcycles constitute one of the chief modes of transportation and by far, the most common form of informal transport [4–6]. There has been a phenomenal increase in the use of motorcycles for commercial purposes in most rural cities of Nigeria in the last few years. For instance, as at 2008, there were over 120,000 motorcyclists in Akwa Ibom State alone, which is just one of the 36 states in Nigeria [3].

The use of motorcycles for passenger transport gained acceptance and wide recognition in Nigeria after the economic recession of the early 1980s [1,6]. The lack of adequate and

sustainable public transport cum poor urban planning in most Nigerian cities created a transport gap for the motorcycles to fill in passenger transportation needs [5]. Motorcycle use as a means of transportation in Nigeria heightened due to its convenience, affordability, easy maneuverability and ability to navigate through poor road networks and traffic congestions found in large and commercial cities, compared to four wheeled vehicles [7]. For residents in urban cities, motorcycling is a popular means of transportation for selected persons who cannot maintain their cars for economic reasons and unemployment constraints [4].

However, motorcycles riding are associated with a lot of negative health outcomes. Motorcyclists are about 35 times more prone to die than passenger car occupants and 8 times more likely to be injured [7]. Also, they have a 7 fold increase in the accident rate for vehicular person per mile and a 17 fold fatality rate compared with motor vehicles [8]. A substantial number of road crashes in Nigeria involve motorcyclists. Evidence shows that, motorcycles accounted for 42% of crashed vehicles in the year 2000; 43.7% in 2004; 26.34% in 2008 and 22.7% in 2009. The percentage involvement of motorcycles in the decade data (2000- 2009) stood at 26.24%. This means that one in every four vehicles involved in crash is a motorcycle [5].

Motorcycling is the mode of transport involving by far the greatest risk [2–4]. The factors associated with risk from motorcycling operate at three levels according to [4,5].

- The agent (vehicle),
- The host (road user) and
- The environment (road-condition)

Although, other examples of host factors have been documented (lack of road safety education, flaunting of legal age of driving, overloading while driving, inability to identify and use road safety codes, lack of riding license, helmets, goggles and fire extinguishers by [1,3–5,9,10], the use of substance and its risk of injuries had been implicated among those involved in motorcycling activities [11,12].

In 2002/2003, according to National Survey on Drug Use and Health (NSDUH) report [13], 16.6% of adult drivers aged 21 or older (an estimated 30.7 million persons) reported that, they had driven while under the influence of alcohol during the past year. Among drivers of this age group, 15.7% had driven under the influence of alcohol during the past year and 3.0% had driven under the combined influence of alcohol and drugs during the past year. Also, in 2003, 10.9% of motorcyclists that were involved in fatal motor vehicle crashes were reported to have driven under the influence of alcohol [13]. Canadian drivers reported having driven within two hours of using a potentially impairing substance. The Canadian Addiction Survey found out that 4.8% of drivers in Canada admitted having driven within two hours of using cannabis at least once in the past year [14]. Marijuana is the substance used most often (70%) by drivers and is the leading cause of death among young Americans [7].

In a study by Adogu et al. [2] on predictors of Road Traffic Accident (RTA) in Nigeria, alcohol intake among the motorcyclists was found to be an obvious predictor of RTA and death. A high prevalence of 59.5% of RTA that was associated with the use of psychoactive drugs was found among motorcyclists according to a study conducted by Muazu and Aliyu [11] in Zaria, Nigeria. The National Highway Traffic Safety Administration (NHTSA) has reported an increasing numbers of motorcycle deaths associated with alcohol-impaired driving in recent years, especially among persons aged  $\geq 40$  years [15]. Substance or drug refers to all psychoactive substances which when taken by a living organism may modify its perception,

mood, cognition, behaviour or motor function. This includes alcohol, tobacco, solvents, marijuana or Indian hemp, caffeine (Kola), coffee, cannabis, cocaine, benzodiazepines, palm wine and 'paraga'(an alcoholic herbal mixture) [7,11,16–19].

The various reasons for substance use include: to enhance performance while driving [10]; keeping awake, suppression of fatigue, and peer group effect are additional factors influencing psychoactive substance use among motorcycle riders [11,17]. Although, the misuse of drugs has long been considered a major social problem, the acute and devastating consequences of driving while under the influence of drugs has only recently come to the forefront as a public health and safety issue [14]. Substance use can be harmful and its effects can be both immediate to health or long term. Injuries such as bruises, lacerations and fractures of upper and lower limbs can have immediate effects on health [11]. Substance use also affects cognitive development and short-term memory and also has Long-term effects like nausea, insomnia, and loss of weight, convulsions and depression [20]. Neuro-trauma cases have been reported by respondents who used alcohol [9]. Of the 537 cases in a study of road accidents in South East Nigeria, 68.3% were related to motorcycles [21]. Alcohol consumption has been implicated to be a cause of liver cirrhosis in developed countries [18]. Also, there is a strong association between heavy alcohol use and tuberculosis [22].

Although, it is well known, that psychoactive substances impair driving performance and threatens safety of motorcycle riders [13,23], there is dearth of information regarding perception of motorcycle riders concerning consequence of use of substance to the health and safety of commercial motorcyclists for which this study was designed to assess. Thus this study sought to determine commercial motorcyclists' perception on substance use and its consequences on health and safety. Without evaluating the situation through research many of the public views about substance use among motorcyclists will be based on assumptions.

## **2. MATERIAL AND METHODS**

The study which utilized descriptive cross-sectional design was conducted in Ibadan North Local Government Area of Oyo State among commercial motorcyclists. The major types of commercial transport in the town are minibuses, taxi-cabs and motorcycles. The study period was between April 2010 and March 2011. At the time of the study, there were 120 registered members of the association of motorcycle riders. All registered commercial motorcyclists were included in the study. The motorcyclists not involved in commercial transportation were excluded from the study. Sample size was calculated using Krejcie and Morgan [24] formula for calculation of sample size.

$$\begin{aligned} s &= \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)} \\ s &= \frac{3.841 \times [120 \times 0.5] (1-0.5)}{0.05^2 (120-1) + 3.841 \times 0.5(1-0.5)} \\ s &= \frac{3.841 \times 30}{0.2975 + 3.841 \times 0.25} \\ s &= \frac{116.13}{1.25775} \\ s &= 92 \end{aligned}$$

Convenient sampling method was used to collect data from the 80 motorcyclists that gave their consent to participate in the study. Structured interviewer administered questionnaire was used to collect information on socio-demographic characteristics, perception of commercial motorcyclist on consequences of substances, their behaviour towards consequences of substance use on health and safety and the effects of substance use. The

Cronbach's Alpha reliability Coefficient of the instrument was 0.703. Permission was obtained from the leaders of motorcyclists' association to conduct the study and their assistance was duly provided in the mobilization of members. Informed consent from the individual motorcyclists was obtained before the administration of the questionnaires. The data was collected by the researchers with the aid of a research assistant.

The data collected were coded and analyzed using SPSS version 15. Perception was accessed using the various questions on perception to see their views about substance use this was scored and categorized into high for those with over half of the expected score and low for those below the expected score. The Perception was cross-tabulated with age and educational status as well as behaviour of respondents towards substance use. Behaviour was determined by using questions that assessed whether they were using substances or not. Statistical methods used included frequency counts and Chi square test statistics was used to test associations between categorical variables with the level of significance set at  $p \leq 0.05$ .

### **3. RESULTS AND DISCUSSION**

The socio-demographic information of respondents presented Table 1 shows that majority of the respondents were within the age of 30-39 (36.3%), were married (73.0%) with Christianity (46.8%) as their religious affiliation. Also, greater proportion (72.5%) were of Yoruba ethnicity. Educationally, 47.5% had completed secondary education and 42.5% had been traders previously. In addition to motorcycle riding as a profession, majority of the respondents (65.0%) had other jobs.

Table 2 shows the perception of respondents' on substance abuse. Majority (46.3%) of the respondents defined substance as the act of taking substances to modify mood. Local gin mixture was indicated by 40.0% of the respondents as the type of substance they use. A large proportion of the respondents (70.0%) do not believe that substance use can affect one's health negatively while over half (57.5%) believe that anyone under the influence of alcohol can cause accident.

Information on substances consumed by respondents is shown in Table 3. More of the respondents (23.8%) have consumed local gin while the least substance consumed by the respondents includes cocaine (1.3%). On the duration of use of substances, 23.8% of the respondents said they have been using substance within 10-20 years while the least reported duration of consuming substance is 2-5 years. Substances use is a big risk to their health and also affects optimum performance in terms of daily revenue generation.

The various reasons for substance use are presented in Table 4. Enhanced visibility (51.3%), aids in forgetting problems (47.5%) and relaxation (45.0%) were some of the reasons highlighted by respondents for substance use during driving. Also, 18.8% of the respondents felt that substance use helps one to forget the nation's economic problems, 42.5% are of the view that, it helps in improving work performance and 40.0% are of the opinion that, it helps them to feel 'high' during moments of reduced emotional state.

Incidence of road traffic accident was recorded among (34) 45.9% of the respondent. Out of those who have been involved in an accident, 25 (50.0%) of the respondents said it was a fatal accident. Also, among those who have been involved in an accident, 55.4% said they sustained injuries presented in Table 5.

**Table 1. Respondents' Socio demographic characteristics**

<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>
<b>Age (years)</b>		
Below 20	2	2.5
20-29	20	25.0
30-39	29	36.3
40-49	20	25.0
50 and above	9	11.2
<b>Marital status</b>		
single	16	20.2
Married	59	73.2
separated	1	1.3
Divorced	1	1.3
<b>Educational status</b>		
Primary education	36	45.0
Secondary education	38	47.5
Post secondary but not University	3	3.7
Others	3	3.8
<b>Former work</b>		
Trader	34	42.5
Factory worker	8	10.0
Security worker	13	16.2
Civil servant	7	8.8
Company worker	6	7.5
Unemployed	4	5.0
Others	4	5.0
No response	4	5.0
<b>Other jobs</b>		
Yes	52	65.0
No	26	32.5
No response	2	2.5

Table 6 shows the association between perception of substance use and age as well as educational status. There was a significant association between age and their perception of substance use at  $p=0.5$ . Educational status revealed no significant association with perception about substance use at  $p=0.545$ . It also shows that the Perception and Behavior of motorcyclists' Riders are significantly different at  $P= 0.04$ .

### 3.1 Discussion of Findings

This study assessed the perceived consequences' of substance use on health and safety among commercial motorcyclists in Ibadan North Local Government Area of Oyo State. The major limitation of this study is that sample size was small and self report was used thus findings cannot be generalized beyond the study area. The findings could be used to plan further studies on this subject matter. It is interesting to note that 36.2% of the respondents use substances while working despite the fact they are prone to road traffic accidents as 34 (45.9) had been involved in RTA in the past. The respondents were all males and majority, (73.2%) of the riders were married. The male preponderance in this study correlates with other published reports [1,3,4]. This is not surprising as the occupation is male dominated

and these males are traditionally breadwinners and are likely to be involved in outdoor and risky activities including commercial motorcycling.

**Table 2. Perception of commercial motorcyclists on substance use**

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Substance abuse is:</b>		
Taking of hard drugs	16	20.0
Use of harmful substances	14	17.4
Taking substances to modify mood or perception	37	46.3
No response	13	16.3
<b>Type of substance commonly used</b>		
Cigarette/Tobacco	19	22.6
Alcohol	11	13.8
Local Gin Mixture	32	40.0
No response	13	17.6
<b>Substances affect health negatively</b>		
Yes	13	16.2
No	56	70.0
No response	11	13.8
<b>Substances help people ride motor bikes better</b>		
Yes	30	37.5
No	36	45.0
No response	14	17.5
<b>Can someone under the influence of alcohol cause accident</b>		
Yes	46	57.5
No	20	25.0
No response	14	17.5
<b>Is use of substance before starting work is safe</b>		
Yes	20	25.0
No	46	57.5
No response	14	17.5
<b>Use of alcohol can cause liver problem</b>		
Yes	47	58.8
No	15	18.8
No response	18	22.4

About 36.0% of the motorcyclists in both groups were between 30-39 years of age. This is similar to findings in another study carried out in Yola, Adamawa State, Northern Nigeria showed that 88% of the motorcyclists in the study were aged between 18 and 30 years [3]. The age range documented that is found to engage in motorcycle riding shows the age that is economically and actively productive age. Riders of commercial motorcycle in this study were seen to be formerly pre-occupied with trading (42.5%) before reverting to motorcycle riding for commercial purposes. This is indicative, as supported by Owoaje et al, [1], of the declining economy in Nigeria with attendant peak in unemployment and non-availability of jobs which has led to an increase in the use of motorcycles for commercial transportation for economic supplementation.

**Table 3. Behaviour of respondents' towards substance use**

Variable	Frequency	Percentage
<b>Use of substances while working</b>		
Yes	29	36.2
No	44	55.0
No response	7	8.8
<b>Substance used</b>		
Beer	4	5.0
Cocaine	1	1.1
Herbal mixture	4	5.0
Cigarette	8	10.0
Local gin	19	23.8
Indian hemp	3	3.8
Others	1	1.3
No response	40	50.0
<b>Duration of use of substance (years)</b>		
1-2	3	3.8
2-5	1	1.3
5-10	2	2.5
10-20	19	23.8
20 and above	16	20.0
No response	39	48.6

**Table 4. Reasons for using substances**

	Yes		Not Applicable		Total	
	Freq	%	Freq	%	N	%
Colleagues use substances	9	11.3	71	88.8	80	100
Use when feeling low	32	40.0	48	60.0	80	100
Loss of job	10	12.5	70	87.5	80	100
Form of relaxation	36	45.0	44	55.0	80	100
Improves work	34	42.5	46	57.5	80	100
Makes one see clearly	41	51.3	39	48.0	80	100
Helps one forget problems	38	47.5	42	52.5	80	100
Helps one forget troubles	28	35.0	52	65.0	80	100
Helps one forget nation's economic situation	15	18.8	65	81.3	80	100

**Table 5. Respondents' involvement in an accident**

Variables	Yes	%	No	%	Total	%
Ever been involved in an accident	34	45.9	40	54.1	80	100.0
Had fatal accident	25	50.0	25	50.0	80	100.0
Did you sustain any injury	31	55.4	25	44.6	80	100.0

Substances commonly used by these motorcyclists' shows that 40.0% consume local gin mixture. This finding is comparable to that by [10] who stated that 34.8% of motorcyclist were found to consume mainly local herbal mixtures and concoctions that contained a considerable quantity of alcohol. This attitude still shows the level of availability of



psychoactive substances, its affordability by consumers and how accessible it is to obtain psychoactive substances in the country especially in the face of high-level awareness of its negative consequences in the health of consumers. Also, this trend reveals the level of addiction to substances. Despite the heavy taxes levied on manufacturers of these substances and subsequent increase in the price of these psychoactive substances, consumers could revert to the consumption of local mixtures which are adjudged to contain alcohol are quite affordable to the average income earner.

**Table 6. Perception of substance abuse and selected demographic variables**

Variable	Perception			X <sup>2</sup>	p- value
	Low	High	Total		
<b>Age (years)</b>					
<20	6	16	22	5.730	0.05
30-39	13	16	29		
40 years and Above	10	19	29		
<b>Total</b>	<b>29</b>	<b>51</b>	<b>80</b>		
<b>Educational status</b>					
Primary education	10	26	36	0.910	0.545
Secondary education and above	19	25	44		
<b>Total</b>	<b>29</b>	<b>51</b>	<b>80</b>		
<b>Behaviour</b>					
Poor	21	31	29	1.518	0.04
Good	8	20	51		
<b>Total</b>	<b>29</b>	<b>51</b>	<b>80</b>		

Although, over half of the respondents are of the opinion that, use of alcohol can cause liver problem (58.8%); the use of substance before starting work is not safe and someone under the influence of substance can cause accident (57.5%), a greater proportion (70.0%) of the respondents disagree that substances negatively affects health. This position reflects a despondent situation. The mingling of motorcyclists' with peers whose ideology of psychoactive consumption is at variance with its consequences could contribute to the observed attitude highlighted by the motorcyclist in relation to psychoactive consumption. In addition, the existence of high level of ignorance about the negative consequences of psychoactive substances consumption reflects motorcyclists' access to inaccurate information being disseminated by various existing media regarding the consequences and outcomes of consuming psychoactive substances.

Most media stations in the country involved in dissemination of health concepts such as implications of psychoactive substance consumption may not do so using relevant evidence-based strategies capable of instilling behaviour change and may not be designed to capture and sustain attention of its audience.

The study shows that 36.5% of respondents use local herbal mixture (local gin) which contains alcohol while motorcycling. About 16.3% alluded taking this drink twice daily as it makes them see clearly (51.3%). This situation is comparable to that by [10] were respondents take these substances as energy boosters and [4] reiterated their use of substances as a way of suppressing fatigue and sleep during driving. This picture is rather worsening and it is not surprising that the incidence of motorcycle accidents due to motorcycle riding had been on the increase considering other variables. The reasons given above and the consequent consumption of psycho-active substances fuels the incidence of RTA due to the ability of these substances to impair cognitive function and suppress the

ability to identify and avoid settings and situations that can result in Road Traffic Accident (RTA). These reasons for the use of substances while driving reflects the existence of incorrect myths about the effects of psycho-active substance consumption, and the level of importance attached to health by male gender.

Accidents and injuries were the aftermath of the consequences of driving under the influence of psychoactive substances as up to 45.9% has had accidents. This is comparable with that cited by [1,4,9,11]. Factors cited by other authors [1,21] that could be responsible for the incidence of RTA could be the existence of bad roads, poor vehicular maintenance, absence of protective equipments, impatience while driving among others. In this study, age was found to be related to the behaviour of motorcyclists towards consequences of substance use. Those who are younger and consume psychoactive substances are more likely to be at risk of RTA than older motor cycle riders. The proportion of motorcyclists who had accidents was significantly higher in the 20-29 and 30-39 age groups according to [1]. Respondents who are still younger may still be oblivious of the consequences of driving under the influence of substances. The findings from this study have show that many these motorcyclists indulge in the use of various substances which puts them at various health and transport safety risks. These were also linked with previous studies. It is also important to note that apart from use of substances, other factors that contribute to road traffic accidents should be addressed.

### **3.2 Suggestions for Further Studies**

- There is need for further study on this topic using a larger sample size.
- Qualitative studies should be carried out to find out why some motorcyclists still indulge in the habit of indulging in taking various substances while being aware of some of the negative consequences.

### **3.3 Implications of Findings/ Recommendations**

Health workers should use every opportunity to educate the populace on the consequences of substance especially during driving or operation of machinery. More effort should be made to ensure that factors contributing use of these substances are addressed in order to improve safety and health of the populace. Those identified with the habits should be counseled individually. Peer education process can be put in place to further improve the awareness of negative consequences of substance use especially during work. The leaders should be encouraged to be role models to the younger ones. To achieve all these we recommend the following:

1. Government should enforce policy that prohibits the use of substances while riding motorcycle or driving.
2. Use of psychoactive substances should be banned in public places like motor parks, market places and in public assembly.
3. Health works act as public advocates in order to address some identified problems through public mediums.
4. Information on substance use consequences should be disseminated in Local languages.
5. Traditional and religious leaders should be encouraged to educate members of their community on the need to avoid substance use and also proffer disciplinary measures for offenders.

6. Leaders of the Motorcyclists' association should be trained to educate others and be empowered to identify and sanction offenders.
7. Government should fund multi-zonal study on this topic and also explore reasons for various behaviors in order to find lasting solutions.

#### **4. CONCLUSION**

Consumption of substances before driving has the ability to impair cognitive functions of the motorcycle driver and reduces his sense of judgment. It affects their perception and interpretation of bad driving. This consequently could lead to the occurrence of RTA as seen in this study. The various factors that contribute to substance use and consequent accidents need to be addressed by Government. It is equally important to intervene in the psychosocial and economic problems being faced by the motorcycle riders as many entered into the business out of frustration of unemployment. Urgent sustained educational intervention would deem appropriate to reduce substance use while riding or driving in order prevent the occurrence of RTA and improve the quality of life of motorcycle riders. More so, there will be need to replicate this study in other locations.

#### **CONSENT**

The authors declare that informed consent was obtained from the participants before data collection. This was part of the instrument for data collection.

#### **ETHICAL APPROVAL**

This survey was not hospital based. It was questionnaire based study. Approval for the study was sought and obtained from the leadership of motorcyclists' association in Ibadan North Local Government Area Oyo state, Nigeria. The study was explained to the respondents and informed consent from the individual motorcyclists was obtained before the administration of the questionnaires

#### **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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