

TRAFFIC VIOLATIONS OF MOTORCYCLE RIDERS IN FATAL AND SERIOUS INJURIES ACCIDENTS IN SWEDEN

Maria Nordqvist¹, Dimitris Margaritis², Jesper Christensen^{1,2}

¹ *Sveriges MotorCyklister (SMC) Gamla Tunavägen 30, 784 60, Borlänge, Sweden*

² *FIM Europe Via Giulio Romano 18, I-00196, Roma, Italy*

Presenter: *Maria Nordqvist* (“substitute-presenter”: *Dimitris Margaritis*)

Abstract

It becomes more evident that many serious traffic violations are a problem mainly amongst those who ride a motorcycle without a valid driver license. In Sweden within 2011-2018, 94 riders were missing a valid driver's license out of 297 fatalities, which corresponds to 32%. The average age of those who died and did not have a valid license was 32.6 years old, a much younger group compared to the average of 45.64 years of the license holders. 97% were men. The proportion of fatalities without a valid driver's licenses has increased significantly in 2011-2018 compared to 2005-2010 when it was 25%. Many riders who died in a motorcycle accident had no license, had never undergone training and did not have the knowledge required to ride a motorcycle. Their average age of about 33 years old indicates that the problem is not only about young people. Thus, a driver's license is considered as an absolute requirement for any rider, especially when so much effort is spent in the country to reach the Vision Zero goal.

Keywords: Motorcycle accidents, serious traffic violations, motorcycle riding license, training.

1. Introduction

Motorcyclists are conscious about road safety like all other road users. The majority do not take unnecessary risks and enjoy riding their motorcycles. It is obvious that a motorcyclist should have a valid driver's license when driving. This confirmed in a study conducted by SMC, VTI and NTF [1], [2].

In the case of fatal accidents amongst motorcyclists, there are some factors that recur repeatedly. SMC has previously called these factors "extreme behavior". It contains four factors, namely: 1. Illegal riding without a valid license, 2. Riding under influence of alcohol and/or drugs, 3. Aggressive riding and 4. Very high speed combined with carelessness in traffic. SMC has decided to use the concept serious traffic violations instead which is the correct term for these crimes for all road users. The proportion of fatalities involving one or more of these factors is increasing, while at the same time, the total number of motorcycle accidents is decreasing. It is becoming clear that serious traffic violations are a problem mainly amongst those who ride a motorcycle without a valid driver's license. This group is difficult to reach and influence with traditional road safety measures. They are also not members of SMC and the motorcycle community.

VTI analysed 236 cyclists who were killed in 2006-2010. Of these, 27 had alcohol in their blood, 156 did not have alcohol in their blood, and for the remaining 53 cyclists the presence of alcohol was unknown. One had drugs in the blood and among 35 of those with unknown alcohol presence drugs were found. None of the fatalities affected with alcohol used a helmet. VTI's study also shows that cycling with alcohol in the body seems to be socially accepted, even though the interviewees pointed out numbers of disadvantages [5].

In 2018, VTI published a study showing that a quarter (25%) of the affected truck and bus drivers who were involved in fatal accidents or seriously injured during 2008-2015 lacked a valid

driver's license. This percentage is high compared to the two percent who were affected amongst all bus and truck drivers involved in serious accidents [6].

SMC compared those who were killed on a motorcycle (riders and passengers) to the killed car drivers (not passengers) without a valid driving license 2010-2014. The use of alcohol and drug effects was also studied. Seven percent of the car drivers did not have a driver's license. 25 percent of the fatal motorists who did not have a driver's license were affected by alcohol. This is a much higher share compared to all car drivers where seven percent were affected by alcohol. 50 per cent of the fatalities among car drivers who did not have a valid driver's license were affected by drugs, which is significantly higher compared to all car drivers where seven per cent were affected by drugs [7].

2. Methods

SMC has compiled data from in-depth studies of fatal motorcycle accidents at the Swedish Transport Administration since 2010. The data used in this study includes rider, passenger, age, gender, driver's license status, ownership, vehicle status, type of accident, usage of helmet and influence of alcohol and/or drugs.

SMC has gathered data from the Swedish Transport Agency on police reported motorcycle accidents involving seriously injured motorcyclists and passengers. The data included e.g. rider, passenger, age, gender, motorcycle model, driver's license status, ownership and driving ban. SMC has compiled data between 2005- 2018. The analysis of the data has been made on the bases of descriptive statistics.

3. Results

Too many people who die on a motorcycle have no driver's license, have never undergone training and do not have the knowledge required to ride a motorcycle. Within this group, other serious traffic offenses are also over-represented. The share of riders lacking a valid license represented 25 percent of all fatal motorcyclists in 2005-2010. This is shown in Figure 1.

Dödsolyckor med förare utan mc-körkort 2005-2010

	dödsolyckor utan mc-kort	alla dödsolyckor
n	65	263
%	25%	-
Singelolyckor	62%	41%
Medelålder förare	30	39
Alkohol eller droger	60%	26%
Om alkohol, medel promille	1,6	1,4
Förare är juridisk ägare	32%	63%
Förare utan hjälm	20%	7%
Cross/enduro mc	22%	6%
Supersport mc	37%	38%
Oregistrerad mc	12%	3%
Avställd mc	35%	11%
Bedömd hastighet mkt över hastighetsgräns	42%	36%
Mörker, gryning eller skymning	46%	24%
Glesbebyggt område	46%	70%
Kommunal gata	55%	27%

Källa: djupstudier av dödsolyckor

012-01-20

TRAFIKVERKET

Figure 1. Fatal accidents on motorcycle between 2005-2010, without driving license compared to all fatal accidents where riders without a license are included. Source: The Swedish Transport Administration.

Unfortunately, this is not the entire truth about the fatalities between 2005-2010. Many of the riders without a license did not own the motorcycle used in the fatal accident. In addition, the motorcycles were often unregistered and uninsured, and are therefore not allowed to be used on the road. One fifth of the riders in this group did not wear a helmet when riding which has been a legal requirement in Sweden since 1975. Furthermore, in the "killed without a driver's license" group, a majority (60 percent) were intoxicated and/or under influence of drugs during 2005-2010.

3.1. Illegal driving amongst fatal accidents on motorcycle between 2011-2018

SMC has compared the group that did not have a valid driver's license with those who had a valid driver's license between 2011-2018 [3]. Out of 297 fatalities, 94 people did not have a valid driver's license, which corresponds to 32%. The average age of those who did not have a valid license was 32.6 years old, which is significantly younger compared to 45.64 years old in the fatalities of license holders. However, an average age of about 33 years old indicates that the problem is not only about young people. The proportion without driver's licenses has increased compared to the period between 2005-2010 when they accounted a 25 percent.

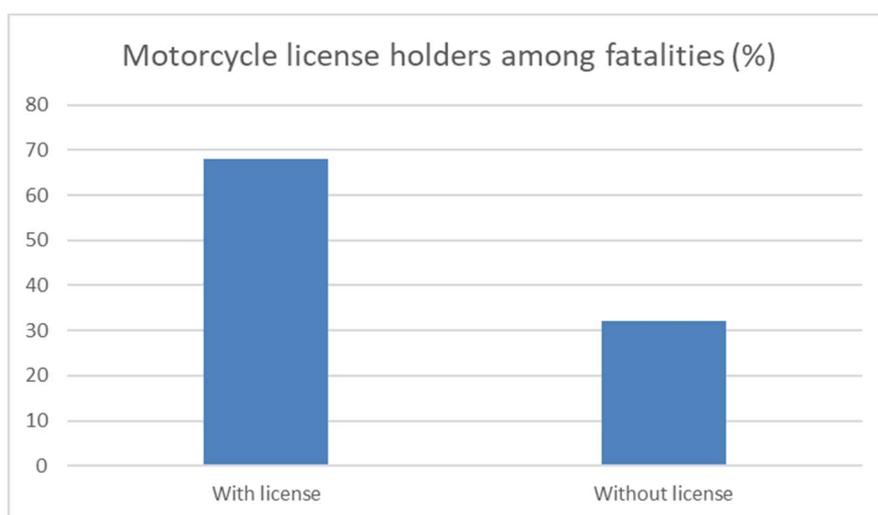


Figure 2. Driving license status among fatal accidents at two-wheeled motorcycle 2011-2018.

3.2. Influenced by alcohol and/or drugs

When SMC compared the group without a valid license against the license holders, the picture clearly shows that this group was guilty of several serious traffic violations during the ride that led to the fatal accident. One example is that the majority of the people without a valid license who died on two-wheeled motorcycles were affected by alcohol and/or drugs. As many as 73 percent were affected by alcohol and/or drugs, compared to eleven percent affected in the driver's license group. Riding a motorcycle without a driver's license and being affected also increases the risk of serious accidents. The proportion of riders affected by alcohol and/or drugs amongst the people without a valid license has increased compared to the previous period 2005-2010 when it was 60 percent. At the same time, it is a positive sign that the proportion of riders affected with alcohol and drugs falls among those who had a driving license.

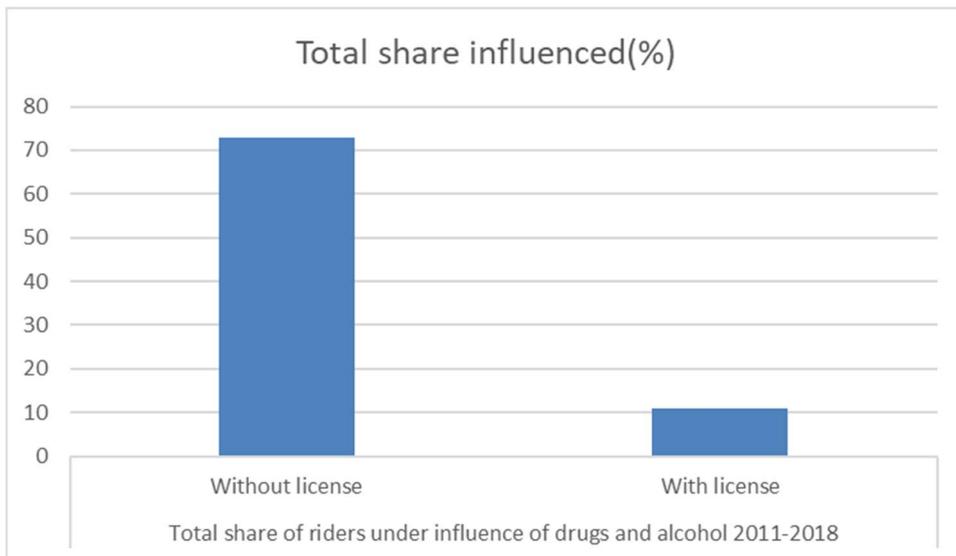


Figure 3. Percentage affected by alcohol and/or drugs amongst fatal motorcycle accidents based on driver's license for motorcycle between 2011-2018.

3.3. Helmet use

Seven riders out of 203 fatal accidents with a valid driver's license did not use a helmet at the time of the accident or the use of a helmet use was unclear. Amongst the fatalities without a valid driver's license, the corresponding proportion was 23 of the total 94 killed. Riding a motorcycle without a driver's license and not using a helmet means a significant increase of risk for serious injuries and death in case of an accident.

3.4. Ownership

Just over half, 52 percent, of those who did not have a valid driver's license owned the motorcycle they were riding at the fatal accident. This can be compared to 87 percent amongst those who had a driving license. Limited experience from a motorcycle increases the risk of being

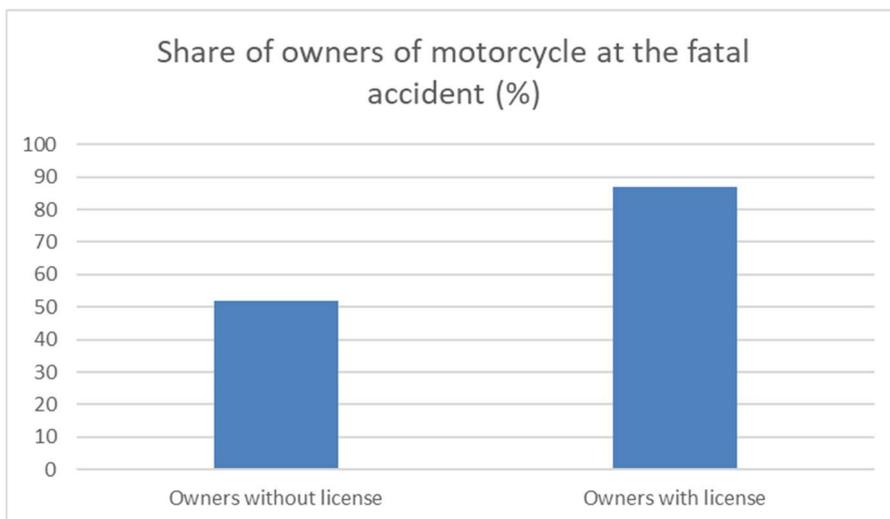


Figure 4. Ownership conditions among those killed on motorcycles based on driver's license holdings 2011-2018.

killed or seriously injured significantly. However, the proportion of owners amongst the riders without a valid driver's license has increased significantly compared to the period 2005-2010 when it was 32 percent.

3.5. Use of illegal motorcycles in connection with the fatal accident

More than four out of five, 77 percent, of those without a valid driver's license rode a motorcycle that was illegal to use in traffic. This means that even if the share of owners has increased among the riders without a license, the PTWs were illegal to use. These motorcycles were taken out of traffic and/or unregistered and/or uninsured or stolen. This problem is small in the group of people with valid driving licenses where only three percent were riding illegal motorcycles, mainly due to a riding ban for not visiting the PTI. Only one driver with a valid license was riding an unregistered motorcycle that was not allowed to be used on the road at the time of the accident, compared with twelve people who did not have a driver's license. Ten people out of the 94 riders without a valid driver's license drove a stolen motorcycle in connection with the fatal accident. None of the people of license holders were riding on a stolen motorcycle.



Figure 5. Percentage of unregistered, stolen and uninsured motorcycles based on driver's license status amongst those killed on two-wheeled motorcycle 2011-2018.

3.6. Other differences in ownership

SMC has looked at the differences in ownership between the rider groups with and without a valid driver's license in 2017. Nine out of 13 fatalities without a valid driver's license owned the motorcycle. The others were stolen or borrowed. However, when SMC looks at ownership in the group, it turns out that only one person was riding a motorcycle that was taxed and insured. Two motorcycles were unregistered enduro bikes which the owners had owned for respectively one year and three months, both where illegal to use on the road. The other five owners had owned the motorcycle on an average of two days before they cancelled the insurance and stated that it was not being used in traffic. The owners died between a day to a year after buying the motorcycle. Only one of 13 motorcycles used in the accidents was allowed to be used on the road.

When we compare this with the 23 riders who had a valid driver's license, all of them rode a legal motorcycle that was insured and allowed to use in traffic. Only two out of 23 were riding a motorcycle they did not own. Seven out of 21 used a motorcycle that has been owned for less than a year.

3.7. Gender and type of accident

It is mainly men who are involved in the fatal accidents with several serious traffic offenses. Collisions with other vehicles in which other road users have caused the fatal accident are far more common amongst the valid license holders while the single accidents dominate the group without a valid license.

3.8. Summary of fatal accidents based on driver's license holdings 2011-2018

The table below is another version of Figure 1 that is covering the period between 2005-2010. The difference with Figure 1 is that the groups are reported separately in Table 1 for the period between 2011-2018.

Table 1. Killed between 2011-2018 on a motorcycle with two-wheels, with and without MC driver's license. (Source: Swedish Transport Administration's in-depth studies 2011-2018).

	Without a license number (%)	With a license, number (%)
Number (share)	94 (32 %)	203 (68%)
Average age	32,6	45,64
Alcohol	23 (24 %)	14 (7 %)
Promille, average (2011-2017)	1,698	1,13
Drugs	28 (30%)	9 (4%)
Both alcohol and drugs	18 (19 %)	0
Total affected	69 (73 %)	23 (11%)
Without a helmet	20 (28%)	7 (3%)
Owner	48 (52 %)	177 (87%)
Not in traffic/unregistered/riding ban	50(53 %)	6(3%)
Cross/enduro	12 (13%)	1 (0,05)
Stolen motorcycle	10 (11%)	0
Total illegal motorcycles	72 (77%)	7 (3%)
Singel accident	60 (64%)	81 (40%)
Collision	32 (34%)	112 (55%)
Wild animals	2 (2 %)	11 (5 %)
Men (riders and passengers)	91 (97%)	192 (95 %)
Women (riders and passengers)	3 (3 %)	9 (6 %)

3.9. Seriously injured on a motorcycle with two wheels between 2013-2018

The statistics includes age, motorcycle model, driver's license status, ownership and driving ban. The statistics clearly show that **illegal riding** is an important factor not only amongst fatal accidents but also amongst motorcyclists who are seriously injured.

1,422 people were seriously injured on a two-wheeled motorcycle during 2013-2018 [4]. There were 1,323 drivers in the group. Nearly, 23 percent of them lacked a **valid driver's license**. In addition to these, information on driving licenses is missing for eleven percent. Only two-thirds, 66 percent, had a valid A-driver's license.

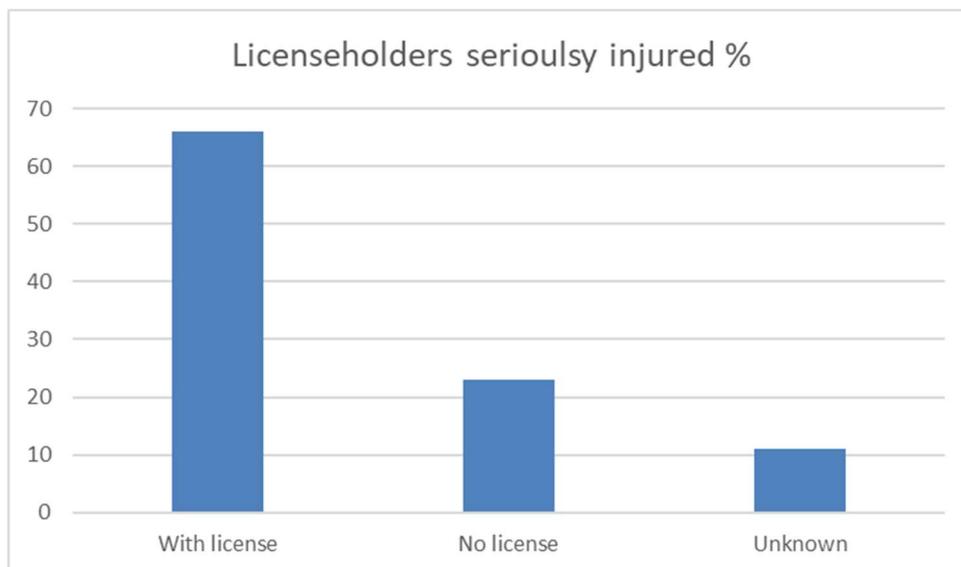


Figure 6. Driving license holders amongst severely injured on two-wheeled motorcycles 2013-2018.

SMC has also studied the **ownership** amongst the severely injured in the period between 2013-2018. Just like among those who are killed on a motorcycle, there are significantly more riders without a valid license who were riding a motorcycle they did not own at the time of the accident. One third, 37 percent, of those who did not have a valid driver's license did not own the motorcycle they were riding at the time of the accident. Amongst those who had a driving license, the corresponding figure was eleven percent.

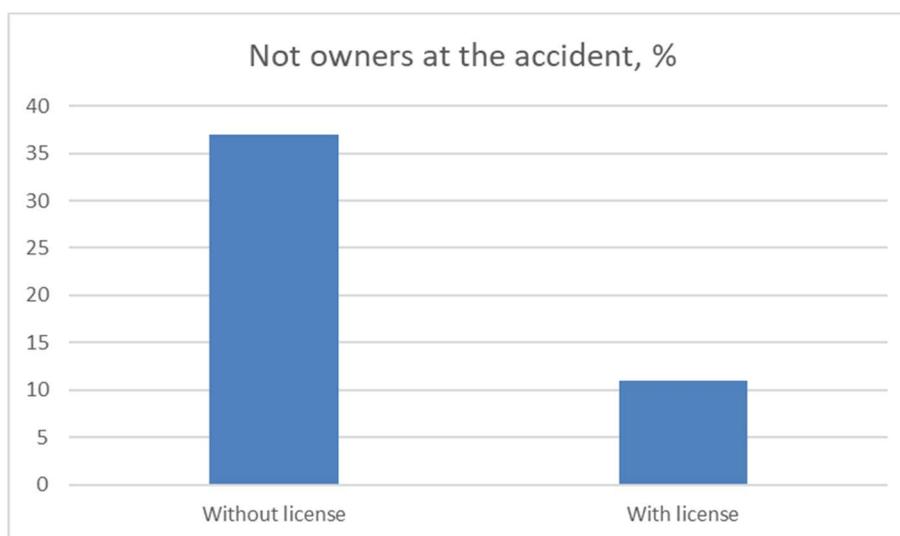


Figure 7. Ownership ratio at the time of the accident based on driver's license between 2013-2018.

The proportion who were riding a motorcycle that was not allowed to use due to a **riding ban** was significantly higher amongst the riders without a valid license, which corresponds to the fatal accidents. Over a fifth, 21.3 percent of those who were severely injured, were riding a motorcycle banned to used, compared with 5.25 percent amongst those who had a valid license.

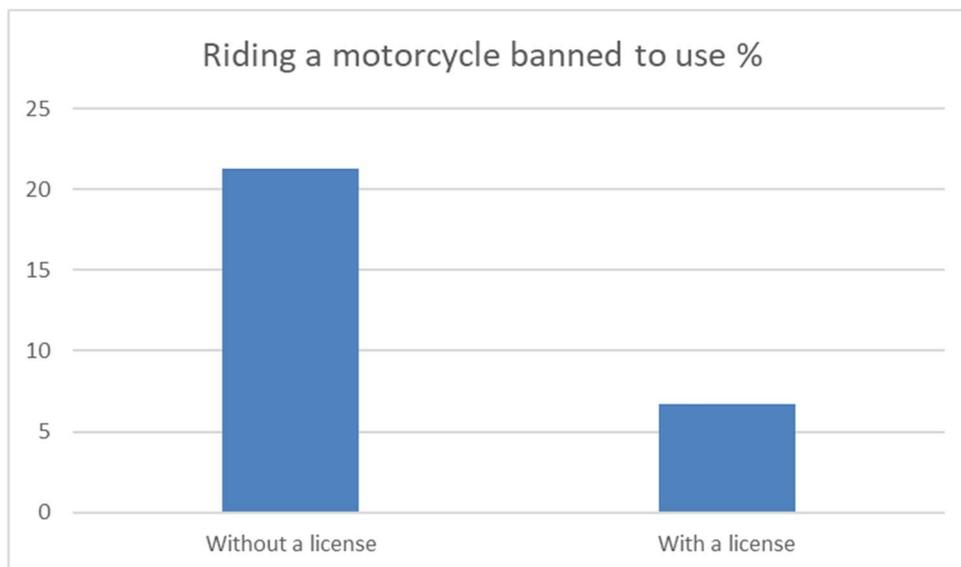


Figure 8. Riding a motorcycle banned to use, based on driver's license 2013-2018.

Amongst the people without a valid license, only 35 percent were riding a motorcycle that was **insured**. The corresponding percentage amongst the group with valid license was 89 percent.

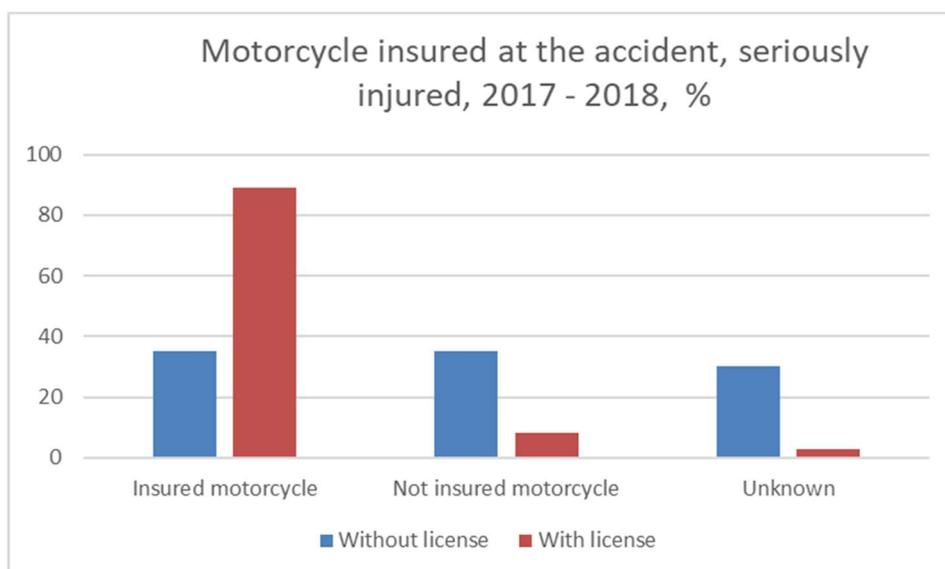


Figure 9. Riding a motorcycle that was insured, based on driver's license between 2017-2018.

4. Include driver's license in the Swedish Zero Vision work

The accident statistics clearly show a different picture of motorcyclists compared to the SMC and NTF study on motorcyclists' attitudes to road safety that was published in 2010 [1]. In this study, everybody states that it has a valid motorcycle driver's license. The attitude to riding drunk and/or under the influence of drugs is clearly distancing. The motorcyclists in the study showed a much better attitude towards the usage of alcohol and drugs in traffic compared to other road

users. To pay vehicle tax, insure and ride a registered vehicle was a matter of course in the study. All riders were using helmets and a majority was also using comprehensive protective equipment. Statistics from the Swedish PTI inspection show that the motorcycle owners are the owner group with highest approval rate year after year. There is only one factor where motorcyclists are "inferior" to motorists - motorcyclists are less likely to obey the speed limits. It must be a priority that all drivers and riders of a motor vehicle have a valid driver's license in the work to reduce the fatalities and seriously injured and reach the goals of Vision Zero. SMC considers that a valid driver's license is an absolute requirement and urges all concerned to include this as a top priority in the road safety work.

Annual statistics are needed in this context from the Swedish Transport Agency and the Swedish Transport Administration, where driver license holdings are found amongst drivers who are killed and seriously injured, as well as sobriety, ownership and driving bans based on the driver's license holdings. There are statistics in STRADA and in-depth studies that allow to measure and track in the same way as SMC has been doing annually since 2011. These statistics should be published and disseminated to all stakeholders in the road safety work annually.

It is also extremely important that the high proportion of serious traffic offenses in fatal accidents and the severely injured are made visible in order to raise awareness amongst the various stakeholders in the road safety work. There is a need to increase awareness for insurance companies, road safety organizations, traffic schools, authorities, courts, politicians, media, family and friends. If the knowledge about the high risk is disseminated, there is an opportunity for everyone to both inform and take actions. For example, can an insurance company require a driver's license to insure a vehicle? How can the Road Traffic Register (with data about licenses, vehicles and insurances) be used?

5. Discussion

SMC has been working with road safety for motorcyclists since 1963 when the organization was founded. However, SMC do not reach the growing group where the riders neither own a motorcycle, nor have a valid motorcycle driver's license. Efforts are required from everyone who works with road safety for this group. Below are listed some examples.

The police have the best opportunity to intervene against riders and drivers who do not have a valid driver's license. Many times, there are people in this group who are well known by the police for previous serious traffic offenses. The police should have a clear mandate to take actions, to do controls and to initiate sanctions specifically directed at the group. Through driver's license checks, the police can also detect people who are wanted in other legal matters.

The absolute requirement to have driving license, when using a vehicle with a motor engine, should be given priority on a large scale. There is a high proportion of people without a valid driver's license in serious accidents, both fatal and seriously injured. Statistics show that there are also many drivers without a valid license amongst those who are killed in passenger cars and amongst bus and truck drivers. Their usage of vehicles is of high risk to other road users, which is a fact that is well known.

SMC is looking forward to the government's review of the penalties for driving/riding under the influence of drugs and alcohol and illegal driving. A sharpening of penalties is needed, especially for those who are involved in traffic offenses over and over again. The police must have more tools to prevent further crime, for example, to make it possible to put people in arrest

after repeated serious traffic crimes, efficient equipment for detecting drugs and to be able to confiscate the vehicles that are used.

It is quite important to change the road users' attitude towards road safety. The fact that so many people are killed and injured while driving and riding a motor vehicle without a valid license indicates that it in certain groups it is acceptable to drive illegally. SMC believes that training should be started early at school age, long before a driver's license is relevant. The basic education from the school should lead to an active choice to get a driving license or not to drive/ride motor vehicles at all. Regardless of a holding of a driver's license, knowledge and traffic safety are matters for the entire community, including pedestrians, cyclists and the new light electric vehicles that are now widely used on streets and sidewalks.

6. Conclusions

This paper presents the traffic violations of motorcycle riders in fatal and serious injuries accidents in Sweden. Within 2011-2018, out of 297 fatalities, 94 riders were missing a valid driver's license, which corresponds to 32%. The proportion of fatalities without rider's licenses has significantly increased in 2011-2018 compared to 2005-2010 when it was 25%. Many riders who died in a motorcycle accident had no license, had never undergone training and did not have the knowledge required to ride a motorcycle.

The motorcycle driving license system need to be reviewed. The world's leading road safety experts have set training as the foremost measure for increased safety amongst motorcyclists. With this as a starting point, we must work to ensure that as many people as possible have access to education, that the education is cost-effective and accessible to everyone who meets the requirements for driving licenses.

Acknowledgements

The authors would like to acknowledge SMC for its support to the realization of this study.

References

1. Maria Nordqvist SMC and Nils-Petter Gregersen, 2010. Survey on motorcyclists' behavior and attitude towards road safety. NTF, 2010.
2. Maria Nordqvist SMC and Nils-Petter Gregersen, 2013. Motorcyclists' attitude to speed and acceptance of speed limits. VTI, 2013.
3. In-depth study of killed on motorcycle 2011-2018, Swedish Transport Administration.
4. The Swedish Transport Agency, 2019. Seriously injured in police-registered accidents at motorcycle and driver's license holdings, ownership conditions and driving bans 2013-2018. STRADA (Swedish Traffic Accident Data Acquisition) and the Road Traffic Register (vehicles and drivers licenses).
5. Henriette Wallen-Warner et al, 2017. Alcohol and cycling, a multidisciplinary study. VTI report 945.
6. Ekström and Forsman, 2018. Presence of alcohol and drugs in drivers of truck and bus who have been involved in fatal accidents and accidents with serious injuries. VTI note 22-2018.
7. SMC, 2017. Extreme behavior-serious traffic violations among killed and severely injured on two-wheeled motorcycle. Version 4.0.