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**SERIOUS ROAD ACCIDENTS ON
INTERURBAN ROADS IN THE REGION OF
MURCIA INVOLVING FOREIGN DRIVERS**

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Summary: INFORMATION SOURCE. DEMOGRAPHIC STUDY. Foreign resident population. Driver census. ANALYSIS OF ROAD ACCIDENTS. Study of the driver of the vehicle involved. Driver responsible for the road accident. Nationality of the driver. CONCURRENT FACTOR. Concurrent factor analysis. Concurrent factor and responsibility in road accidents. Nationality of driver at fault and concurrent factor. ACCIDENT TYPE. Analysis of the accident type. VIOLATION OF THE REGULATIONS. Activity in violation. Violation of administrative rule. ROAD traffic violations in criminal law. CONCLUSIONS. PROPOSALS. BIBLIOGRAPHY.

Resumen: La Región de Murcia es la sexta provincia de España con mayor población extranjera residente en valores absolutos. La mayoría de esos extranjeros son inmigrantes por razones laborales y otros eligen esta región por motivos vacacionales o de ocio. En conjunto, en la región de Murcia conviven personas de más de 175 nacionalidades distintas, personas que, aun teniendo hábitos, formas de vida y costumbres diferentes, acaban coincidiendo en las carreteras de la región, en los desplazamientos que realizan en sus vehículos en su vida cotidiana. La DGT¹ realiza estudios estadísticos de casi todas las variables que se pueden medir en un siniestro vial pero no existen estudios que midan esas variables en relación con la nacionalidad del conductor del vehículo siniestrado. La finalidad del presente trabajo es poner de manifiesto cómo se comportan los datos de siniestralidad vial si se analizan en función del origen nacional del conductor para de esta forma disponer de información que nos permita adoptar medidas concretas dirigidas a reducir el número y gravedad de los siniestros viales en la Región de Murcia.

Abstract: The Region of Murcia is the sixth province of Spain with the largest resident foreign population in absolute values. Most of these foreigners are immigrants for work reasons and others choose this region for vacation or leisure reasons. As a whole, in the region of Murcia people of more than 175 different nationalities live together, people who, despite having different habits, ways of life and customs, end up coinciding on the roads of the region, in the movements they make in their vehicles in their daily life. The DGT carries out statistical studies of almost all the variables that can be measured in a road accident, but there are no studies that measure these variables in relation to the nationality of the driver of the accident vehicle. The purpose of this paper is to show how road accident data behaves if they are analyzed based on the national origin of the driver.

Palabras clave: Siniestralidad vial, Seguridad vial, Región de Murcia, conductor extranjero, nacionalidad del conductor

Key words: Road accident rate, Road safety, Region of Murcia, foreign driver, nationality of the driver.

¹General Traffic Authority

The Region of Murcia is a place of residence for a large number of foreigners and people of different national origins. This means that the region's roads are a meeting point for many drivers whose road safety training and safety culture often differ from those of drivers trained in Spain. This, combined with different habits and customs, causes road accidents in the roads of the Region of Murcia to present distinct aspects when studied from the perspective of the driver's nationality.

There are many studies on road accidents. Specifically, the DGT compiles numerous statistics on accidents that provide information on almost all aspects that can be measured in a road accident. This information that is published in the corresponding statistical accident yearbooks. Nevertheless, none of these studies focus on the national origin of the driver.

Given that the Region of Murcia has one of the highest rates of foreign residents in Spain, this paper has studied the road accident rate and its consequences on interurban roads in this region between 2014 and 2022, with the aim of highlighting the circumstances in which foreign drivers were involved in road accidents and how this affected road accident figures in general.

INFORMATION SOURCE

The study is based on road accidents occurring on interurban roads in the Region of Murcia from 1 January 2014 to 31 December 2022, using the ARENA2 computer system as a source.

ARENA2 is an application that collects and stores data to support the police traffic accident register. ARENA (**A**ccidentes: **RE**cogida de **iN**formación y **A**nálisis) [Accidents: Information Collection and Analysis], which was in place from 2005 until 31 December 2013, was replaced in January 2014 by the current ARENA2 system, which contains new functionalities.

ARENA2 initially allows the officer to enter a minimal set of data collected in the first instance. The data is then expanded with the information demanded by the system, as established in the victim accident report forms, governed by the criteria outlined in Ministerial Order INT/2223/2014, which regulates the communication of information to the National Register of Traffic Accident Victims (Ministerio del Interior, 2014).

One of the main advantages of the information gathering system is that the data collection is performed by the law enforcement officers in charge of traffic monitoring and control who have this responsibility. Based on their presence on the scene, they are responsible for taking statements and drawing up technical reports, as well as attending to those involved and restoring road safety. From the investigation, the officers have extensive knowledge of the event and are therefore considered to be the ideal subjects to fill in the information in the traffic accident file. Furthermore, the information is sent to the file using standardised forms, in accordance with common definitions and procedures that apply to the whole of Spain.

DEMOGRAPHIC STUDY

In order to be able to draw valid conclusions about the significance of foreign drivers in road accidents in the Region of Murcia, it is necessary to have some reference values for the presence of foreigners in this region.

For this purpose, information on the census of inhabitants has been accessed through the web portal of the Spanish National Statistics Institute (INE - Instituto Nacional de Estadística) (Ministerio de Asuntos Económicos y Transformación Digital, 2023), as well as the Regional Statistical Centre of Murcia (Centro Regional Estadístico de Murcia - CARM, 2023)(CREM - Centro Regional Estadístico de Murcia), with data up to 2021.

Meanwhile, it was considered necessary to have specific information on the census of drivers and vehicles in the Region of Murcia in order to have specific data on the number of foreign drivers on the census. This information was provided by the DGT Data Office through the Murcia Provincial Traffic Headquarters (Oficina del Dato, DGT, 2023).

FOREIGN RESIDENT POPULATION

In the year 2021, Spain had a foreign resident population² of 5,440,148 people, of which 222,324 resided in the province of Murcia. This places Murcia sixth in terms of Spanish provinces with the most foreign residents, only behind Madrid, Barcelona, Alicante, Valencia and Málaga.

When examining the data specific to the Region of Murcia furnished by CREM, of the province's total population of 1,518,486 residents, 222,324 are of non-native origin, accounting for 14.64% of the population.

Of all foreigners, almost half, 103,736 (46.66%) are of African origin. Of these, 89,914 are Moroccan, which represents 40.44% of the total number of foreigners. This figure places the province of Murcia second in Spain with the highest number of Moroccan residents, only behind Barcelona with 137,010 and ahead of Madrid with 80,090. Of the other African countries, the most prominent are Senegal with 3,048 people, Algeria with 3,038 people, Ghana with 2,005 people and Mali with 1,723 people.

Of the 55,731 people of European origin residing in the Region of Murcia, the largest population is from the United Kingdom with 16,625 people, followed by Romania with 10,655, Ukraine with 7,433 and Bulgaria with 5,140 people.

There are 43,725 people of South American origin residing in the province of Murcia. Ecuador accounts for the most with 17,603 people, followed by Colombia with 8,162 and Bolivia with 7,491.

² Includes foreigners with Residence Card and Registration Certificate.

DRIVER CENSUS

In order to study the relationship between the origin of the driver and the road accident rate, in addition to knowing the weight of the foreign population in the Region of Murcia, it is important to know the weight of this population in the census of drivers.

The information provided by the Data Office of the DGT, which refers to 31 December 2022, indicates that 9.54% of the drivers registered in the register of drivers in the Region of Murcia are foreign drivers who hold a driving licence issued in Spain. The other 90.46% are Spanish drivers.

Another important piece of information provided by the DGT is that since 2014, 75.47% of the driving licences obtained by foreign residents in Murcia were obtained through the method of exchanging the driving licence of their country of origin for the equivalent in Spain. The remainder were obtained following theoretical and practical examination.

Finally, with regard to vehicle ownership, according to the vehicle registration databases, 11.24% of all vehicles registered in Murcia are in the name of a foreign person.

ANALYSIS OF ROAD ACCIDENTS

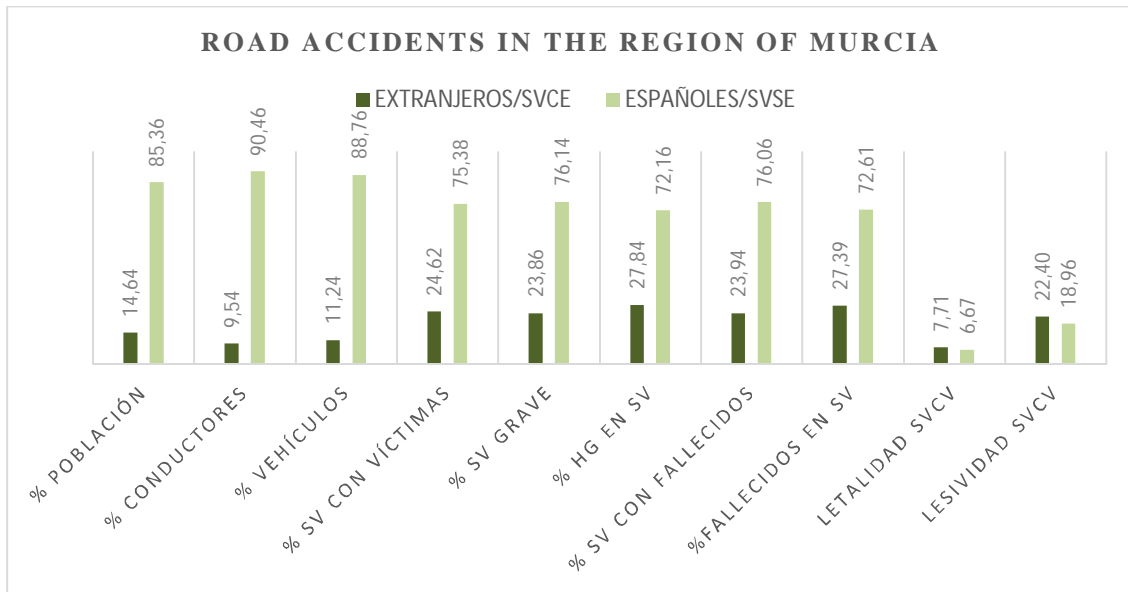
Before starting the analysis and to provide clarity to the forthcoming data, it is advisable to become acquainted with the abbreviations that will be used.

Table 1. Abbreviations

MEANING OF ABBREVIATIONS	
SV	ROAD ACCIDENT
SVG	SERIOUS ROAD ACCIDENT
SVCE	ROAD ACCIDENT WITH FOREIGN DRIVER INVOLVED
SVSE	ROAD ACCIDENT WITHOUT FOREIGN DRIVER INVOLVED
SVCV	ROAD ACCIDENT WITH CASUALTIES
HG	SERIOUSLY INJURED
SVGCE-RESP	SERIOUS ROAD ACCIDENT WITH FOREIGN DRIVER INVOLVED AT FAULT FOR THE ACCIDENT
SVGSE-RESP	SERIOUS ROAD ACCIDENT WITHOUT FOREIGN DRIVER INVOLVED AT FAULT FOR THE ACCIDENT

Source: Prepared internally

In order to make a first approximation to the data on road accident (SV) rates, the data on population, drivers and vehicle ownership were compared with the accident rate data, differentiating between foreign drivers and Spanish drivers. The results are shown in the following graph.



Graph 1. Comparative summary information chapter. Source Arena 2. Prepared internally

What the graph shows us is that in the period 2014-2022, with a 14.64% foreign population in the Region of Murcia, a census of foreign resident drivers of 9.54% and a percentage of vehicles registered in the name of a foreign citizen of 11.24%, there was at least one foreign driver involved in 24.62% of road accidents with casualties, 23.86% of serious road accidents and 23.94% of road accidents with fatalities. Furthermore, 27.84% of serious injuries and 27.39% of fatalities in road accidents occurred in accidents where at least one foreign driver was involved. Lastly, the frequency of foreign driver involvement in road accidents resulted in 7.71 fatalities and 22.40 seriously injured for every 100 road accidents with casualties; in road accidents where no foreign drivers were involved, the fatality and injury rates fell to 6.67 and 18.96, respectively.

After analysing the resulting data, it can be affirmed that the number of road accidents involving a foreign driver exceeded what could be expected, in view of the weight of the foreign population in the Region of Murcia.

Similarly, it is observed that the most serious consequences of road accidents (fatality and injury rates) are worse in accidents involving a foreign driver than in those where a foreign driver is not involved.

STUDY OF THE DRIVER OF THE VEHICLE INVOLVED

In order to study the frequency of occurrence of serious road accidents (SVG) and the involvement of foreign drivers, it is necessary to know the number of vehicles involved.

Table 2. Type of vehicle in serious road accident.

VEHICLE TYPE IN THE 968 SVG											
SVGTC	BUS	BIC	LOR	VAN	CYCL	MOT	PAS	OTHE	PE	OVERAL	%
VEH. DRIVEN BY FOREIGNERS	2	13	33	30	2	15	159	5	3	262	16.10
VEH. DRIVEN BY SPANIARDS	8	58	148	116	61	246	666	38	24	1365	83.90
TOTAL, VEHICLES IN SVG	10	71	181	146	63	261	825	43	27	1627	100.00

Source ARENA 2. Prepared internally

Thus, 16.10% of all vehicle drivers or pedestrians involved in SVG were foreigners, while the remaining 83.9% were Spanish drivers or pedestrians.

We can also find out the percentage in which different types of vehicles are involved.

Table 3. Percentage of vehicle type in serious road accidents.

PERCENTAGE OF VEHICLE TYPE IN THE 968 SVG						
SVGTC	%LOR	%VAN	%CYCL	%MOT	%PAS	% TOTAL
VEH. DRIVEN BY FOREIGNERS	12.60	11.45	0.76	5.73	60.69	16.10
VEH. DRIVEN BY SPANIARDS	10.84	8.50	4.47	18.02	48.79	83.90
TOTAL, VEHICLES IN SVG	11.12	8.97	3.87	16.04	50.71	100.00

Source ARENA 2. Prepared internally

Thus, of the vehicles used by foreigners when the SVGs occurred, 60.69% were passenger cars, followed by lorries with 12.60% and vans with 11.45%. Among vehicles driven by Spaniards, the most used were also passenger cars with 48.79%, followed by motorbikes with 18.02%, lorries with 10.84% and vans with 8.49%.

As we can see, among foreign drivers, commercial vehicles, lorries and vans have more weight than among Spanish drivers, where, after passenger cars, the most common vehicles in serious road accidents were motorbikes, a vehicle used more often for leisure.

DRIVER RESPONSIBLE FOR THE ROAD ACCIDENT

Of the 231 serious road accidents involving a foreign driver that occurred in the period under study, investigations revealed that in 164 of them the foreign driver was at fault for the accident, causing 60 fatalities and 179 serious injuries in these accidents alone.

This means that, of the 968 serious road accidents that occurred, in 16.94%, the party at fault was a foreign driver; in the remaining 83.05%, the party at fault was a Spanish driver.

As a result of the 164 accidents caused by a foreign driver, 60 fatalities occurred, representing 19.10% of the total number of fatalities in serious road accidents.

Table 4. Road accidents and fatalities by type of driver at fault

DRIVER RESPONSIBILITY IN SVG				
TYPE OF DRIVER AT FAULT	No. of SVG	% of SVG	No. FATALITIES	%FATALITIES
SPANISH DRIVER	804	83.05	254	80.99
FOREIGN DRIVER	164	16.94	60	19.10
OVERALL	968	100	314	100

Source ARENA 2. Prepared internally

Similarly, it can be stated that as a result of the 164 accidents with a foreign driver at fault, 179 serious injuries occurred, which accounted for 19.93% of the total number of serious injuries in road accidents.

Table 5. Road accidents and serious injuries by type of driver at fault

DRIVER RESPONSIBILITY IN SVG				
TYPE OF DRIVER	No. of SVG	% of SVG	No. HG	%HG
SPANISH DRIVER	804	83.05	719	80.07
FOREIGN DRIVER	164	16.94	179	19.93
OVERALL	968	100	898	100

Source ARENA 2. Prepared internally

NATIONALITY OF THE DRIVER

In the study period, 262 foreign drivers of 34 different nationalities were involved in one of the 231 serious road accidents involving a foreign driver. Only accidents involving drivers of 7 of these 34 nationalities account for 68.08% of the total, with the remaining 27 nationalities being of little statistical interest.

Table 6. Foreign drivers involved and at fault in serious road accidents by nationality.

NATIONALITY FOREIGN DRIVERS IN SVG					
% OF THE FOREIGN POPULATION IN THE R. MURCIA	NATIONALITY	NUMBER OF FOREIGN DRIVERS INVOLVED IN SVG	% FOREIGN DRIVERS INVOLVED IN SVG	NUMBER OF FOREIGN DRIVERS AT FAULT	% FOREIGN DRIVERS AT FAULT
40.44	MOROCCO	103	39.31	69	42.07
7.91	ECUADOR	43	16.41	28	17.07
7.47	UNITED KINGDOM	27	10.31	16	9.76
4.79	ROMANIA	22	8.4	13	7.93
3.36	BOLIVIA	9	3.44	6	3.66
3.34	UKRAINE	5	1.91	4	2.44
0.77	MALI	5	1.91	4	2.44
31.92	OTHER	48	18.32	24	14.63
100	TOTAL, FOREIGNERS	262	100	164	100

Source ARENA 2. Prepared internally

Firstly, the table shows that while the Moroccan population is the largest in the Region of Murcia with 40.44% of the total number of foreign residents, they account for 39.01% of the foreign drivers involved in SVGs and 42.07% of the foreign drivers at fault for an SVG.

The second most significant nationality is Ecuadorian, which accounted for 7.91% of the total resident foreign population, 16.41% of the foreign drivers involved in serious road accidents and 17.07% of the foreign drivers at fault for the accident.

In third place were residents from the UK, who accounted for 7.47% of all foreign residents, 10.31% of all foreign drivers involved in serious road accidents and 9.76% of all foreign drivers at fault for the accident.

Lastly, foreign nationals from Romania, who, at 4.79% of the resident immigrant population, accounted for 8.40% of the foreign drivers involved and 7.93% of those at fault for a serious road accident.

An analysis of the information shown shows that Ecuadorian drivers are the worst performers of all those listed, as the relative frequency of both involvement and responsibility in serious road accidents is more than double the percentage of the resident foreign population.

Drivers of Romanian nationality also have a high percentage of both involvement and responsibility in relation to the percentage that their nationality represents in the total foreign population in Murcia. Nevertheless, in addition to the fact that their involvement in absolute numbers is low, the percentages do not reach the levels of Ecuadorian drivers.

The rest of the nationalities show data on both involvement in serious road accidents and responsibility in these accidents, in line with the percentage of each nationality in the overall foreign population of the Region of Murcia.

In the following table we are going to check the weight of these data with respect to the population of the Region of Murcia as a whole. To do so, we are going to compare them to all drivers involved in SVGs (not only foreigners) and all SVGs that occurred in the study period (968 SVGs).

Table 7. Foreign drivers involved and at fault in serious road accidents by nationality

NATIONALITY FOREIGN DRIVERS IN SVG			
% POPULATION IN THE REGION OF MURCIA	NATIONALITY	% DRIVERS IN SVG. (% of 1627)	% DRIVERS AT FAULT IN SVG. (% of 968)
5.92	MOROCCO	6.33	7.13
1.15	ECUADOR	2.64	2.89
1.09	UNITED KINGDOM	1.66	1.65
0.7	ROMANIA	1.35	1.34
0.49	BOLIVIA	0.55	0.62
0.48	UKRAINE	0.31	0.41
0.11	MALI	0.31	0.41
4.7	OTHER	2.95	2.48
14.64	TOTAL, FOREIGNERS	16.10	16.94

Source ARENA 2. Prepared internally

From the information shown we know that the Moroccan population accounts for 5.92% of the total population of the Region of Murcia, 6.33% of drivers involved in serious road accidents and 7.13% of those at fault.

Moroccans, like the rest of the nationalities of foreign drivers, show higher figures for involvement and responsibility in serious road accidents than their respective percentage of the total population. However, the most striking figure is that of Ecuadorian nationals, who represent 1.15% of the population of the Region of Murcia and have been involved in 2.64% of serious road accidents, where they are at fault for 2.89% of them.

CONCURRENT FACTOR

The criteria to consider when completing traffic accident report forms are outlined in Annex II of Ministerial Order INT/2223/2014, which regulates the communication of information to the National Register of Traffic Accident Victims (Ministerio del Interior, 2014). A list of 23 items is included in these forms under the heading "CONCURRENT FACTOR".

In the last update of the ARENA2 APPLICATION CONTENT MANUAL (Observatorio Nacional de Seguridad Vial, 2023) concurrent factors are defined as “*the factors that have had an impact on the accident in the officer's opinion and whose importance appears to be decisive in the production of the accident*”, being a multiple-choice field with 23 options.

It is of interest to analyse the concurrent factors (CF) in serious road accidents and to compare them with the different sets of accidents under study, i.e. to compare whether

or not the most frequent CFs in serious road accidents involving a foreign driver (SVGCE) coincide with the most frequent CFs in serious road accidents without foreign driver involvement (SVGCE). Similarly, it is also of interest to study the incidence of a given CF in relation to the nationality of the driver.

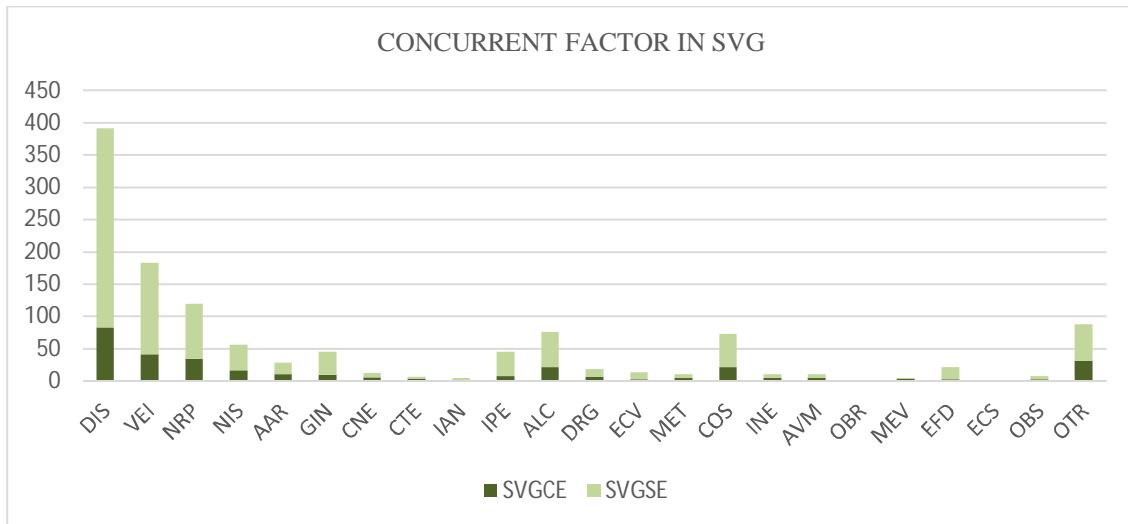
Table 8. Types of concurrent factors in road accidents

CONCURRENT FACTOR (CF)	ABBREVIATION
Distracted or inattentive driving	DIS
Inappropriate speed	VEI
Failure to yield	NRP
Failure to maintain a safe distance	NIS
Unlawful overtaking	AAR
Wrong turn	GIN
Negligent driving	CNE
Reckless driving	CTE
Animal trespassing on the carriageway	IAN
Pedestrian trespassing on the carriageway	IPE
Alcohol	ALC
Drugs	DRG
State or condition of the road	ECV
Adverse weather	MET
Tiredness or sleepiness	COS
Driver inexperience	INE
Mechanical failure	AVM
Section under construction	OBR
Poor condition of the vehicle	MEV
Illness	EFD
State or condition of signage	ECS
Obstacle in roadway	OBS
Other factor	OTR

Source ARENA2. Prepared internally

CONCURRENT FACTOR ANALYSIS

The following graph shows the absolute frequency of each CF in the set of SVGs and, within these, how they are distributed between road accidents with and without a foreign driver involved. It should be made clear that in each road accident one or more factors may be involved in triggering the accident.



Graph 2. CF in SVG with and without foreign driver involved. Source Arena2. Prepared internally

As can be seen in the graph, the CF that is most frequently repeated both in the total SVG and in the SVGCE and SVGSE groups into which it is divided is DISTRACTION, followed by INAPPROPRIATE SPEED and FAILURE TO YIELD. The concurrent factors ALCOHOL, TIREDNESS OR SLEEPINESS and FAILURE TO MAINTAIN A SAFE DISTANCE are repeated much less frequently. The remaining CFs have a very low incidence in the three groups of road accidents studied and are not statistically relevant, so they will not be taken into account in the following phases of the study.

CONCURRENT FACTOR AND RESPONSIBILITY IN ROAD ACCIDENTS.

The CF is an indicator that is directly related to the driver of the vehicle at fault for the accident. We will now analyse the frequency of this indicator among accidents with a foreign driver involved in which the foreign driver was at fault for the accident in order to relate it to the SVG as a whole.

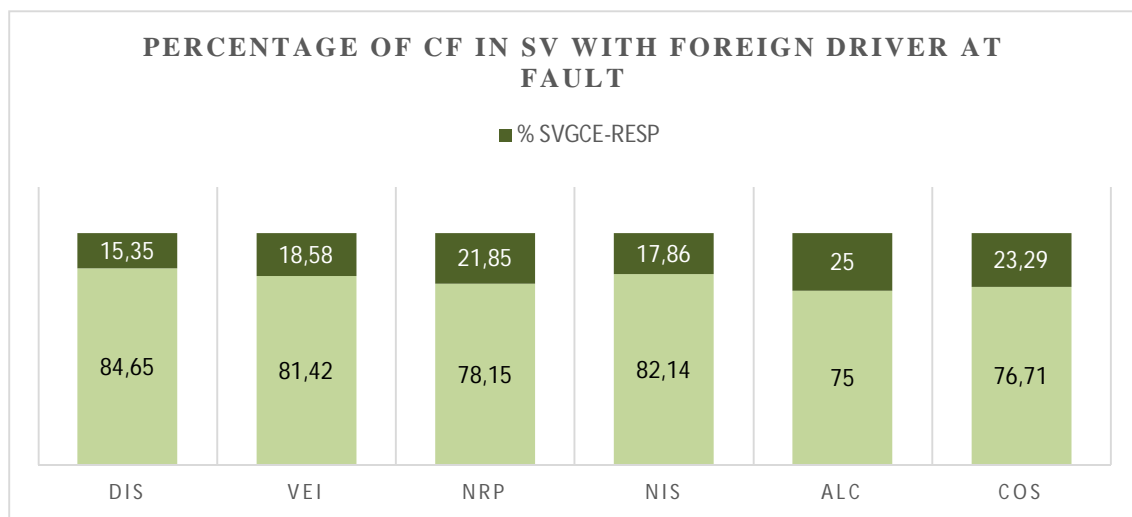
For this purpose, we will check which of the CFs were most frequent in serious road accidents involving a foreign driver (SVGCE-RESP), in order to focus our study on these and disregard those which, due to their low incidence, have an irrelevant weight in the total.

Table 9. Concurrent factor in SVG when the foreign driver is at fault for the SV.

CONCURRENT FACTOR SVGCE-RESP												
	DIS	VEI	NRP	NIS	AAR	GIN	CNE	CTE	IAN	IPE	ALC	DRG
TOTAL, IN SVG	391	183	119	56	28	45	12	6	4	45	76	18
IN SVGCE-RESP	60	34	26	10	8	6	3	2	1	4	19	4
	ECV	MET	COS	INE	AVM	OBR	MEV	EFD	ECS	OBS	OTR	
TOTAL, IN SVG	13	10	73	10	10	0	4	21	0	7	88	
IN SVGCE-RESP	1	1	17	4	2	0	2	2	0	1	19	

Source Arena2. Prepared internally

In view of the data shown in the table, in the following graph we will focus the study only on the six most recurrent CFs and show in what proportion of serious road accidents SVGCE-RESPs with a given CF appear.



Graph 3. Percentage of CF in SVG when the foreign driver is at fault for the SV. Source Arena2. Prepared internally

A detailed analysis of the data shown shows that, of all serious road accidents with CF - FAILURE TO YIELD, a foreign driver was at fault for 21.85%; of serious road accidents with CF - TIREDNESS OR SLEEPINESS, a foreign driver was at fault for 23.29%; finally, most strikingly, of serious road accidents with CF - ALCOHOL, in 25% (one in four), a foreign driver was at fault for the accident.

NATIONALITY OF DRIVER AT FAULT AND CONCURRENT FACTOR

Previous sections analysed serious road accidents and stated the incidence of the nationality of the foreign driver on ‘at fault’ data, concluding that, taken by nationality, in almost all cases, foreign drivers showed higher ‘at fault’ data in serious road accidents than their share of the population in the Region of Murcia as a whole, as shown in table 5.

Below is a table showing the frequency with which each of the six most important CFs is repeated among foreign drivers at fault for serious road accidents, broken down by nationality.

Table 10. CF in SVG with foreign driver at fault by driver nationality

CONCURRENT FACTOR IN SVG WITH FOREIGN DRIVER AT FAULT						
NATIONALITY FOREIGN DRIVER AT FAULT	CONCURRENT FACTORS					
	DIS	VEI	NRP	NIS	ALC	COS
MOROCCO	22	13	17	3	7	5
ECUADOR	11	5	3	3	6	5
UNITED KINGDOM	6	2	2			
ROMANIA	3	5	2	1	0	1
BOLIVIA	3	3			1	
UKRAINE	2	1			1	
MALI	2	1		1		1

Source Arena2. Prepared internally

Once again, drivers from Morocco and Ecuador show the highest values, as they are the ones with the highest frequency of responsibility for serious road accidents.

We will only refer to drivers of those two nationalities, and in the following table, we will display the factors that contributed to the serious road accidents for which they were at fault, along with the percentage this data represents of the total for that specific factor.

Table 11. Percentage of the CF driver at fault SVG nationality Morocco and Ecuador

PERCENTAGE OF CF DRIVER AT FAULT						
NATIONALITY FOREIGN DRIVER AT FAULT	CONCURRENT FACTORS					
	DIS	VEI	NRP	NIS	ALC	COS
ALL DRIVERS	391	183	119	56	76	73
% CF SVG	100	100	100	100	100	100
MOROCCAN DRIVER	22	13	17	3	7	5
% MOROCCAN DRIVER	5.63	7.10	14.29	5.36	9.21	6.85
ECUADORIAN DRIVER	11	5	3	3	6	5
% ECUADORIAN DRIVER	2.81	2.73	2.52	5.36	7.89	6.85
TOTAL % DRIVER MOR + ECUA	8.44	9.84	16.81	10.71	17.11	13.70

Source Arena2. Prepared internally

Analysing the data in this way, we can conclude that in 16.81% of the SVGs with CF - FAILURE TO YIELD and in 17.11% of the SVGs with CF - ALCOHOL, a Moroccan driver or an Ecuadorian driver was at fault for the accident, when between the two nationalities they account for 7.07% of the population of the region.

ACCIDENT TYPE

The type of accident is an additional factor to be considered when investigating a road accident. The method used to determine the type of accident and its sequencing is the METRAS method (Measuring and Recording Traffic Accident Sequence)³ by means of which the instructor, with the study and analysis of the road accident, establishes and reflects in the ARENA2 application the order in which the different events (types of accident) occurred in a serious road accident and the units (vehicles, pedestrians, etc.) that were affected, as well as the event that triggered the most serious consequences for those involved in the accident (Observatorio Nacional de Seguridad Vial, 2023).

In this way, this data is reflected in the ARENA report of each accident by assigning, in the corresponding field, one of the 53 events (types of accident), which are divided into 8 categories, as can be seen in the following image extracted from Order INT/2223/2014, of 27 October, which regulates the communication of information to the National Register of Traffic Accident Victims.

SECUENCIA DEL ACCIDENTE (CUMPLIMENTAR SÓLO EN CASO DE ACCIDENTES GRAVES O MORTALES)			TIPOS DE EVENTOS:																																		
Los vehículos se identificarán como V1, V2, V3, V... Los peatones se identificarán como P1, P2, P3, P... Los conductores que hayan sido atropellados (se han caído del vehículo, estaban subiendo o bajando del mismo...) se identificarán como C. Se le asignará un número C1, C2, C3 teniendo en cuenta el vehículo en que viajaban). En el caso de los pasajero se utilizará PA1, PA2... siguiendo la misma lógica.			COLISIÓN ENTRE VEHÍCULOS 1. COLISIÓN FRONTAL 2. COLISIÓN FRONTOLATERAL AFECTANDO EL LADO DERECHO 3. COLISIÓN FRONTOLATERAL AFECTANDO EL LADO IZQUIERDO 4. COLISIÓN LATERAL O REFLEJA 5. RASPADO POSITIVO 6. RASPADO NEGATIVO 7. COLISIÓN POR DETRÁS, ALCANCE O EN CARAVANA 8. ALCANCE INVERSO 9. COLISIÓN POSTERIOR-LATERAL 10. EMPOTRAMIENTO ATROPELLO 11. ATROPELLO A PERSONA 12. ATROPELLO A ANIMAL → <input type="text"/>																																		
MÉTODO METRAS DE SECUENCIACIÓN DEL ACCIDENTE <table border="1"> <thead> <tr> <th>UNIDADES IMPLICADAS</th> <th>EVENTOS</th> <th>SUCESO MÁS GRAVE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			UNIDADES IMPLICADAS	EVENTOS	SUCESO MÁS GRAVE																															CAÍDA 13. CAÍDA EN LA VÍA 14. CAÍDA DE PASAJERO DENTRO DE BUS CHOQUE CONTRA OBSTÁCULO 15. ELEMENTOS DE OBRAS 16. CONOS U OTROS ELEMENTOS DE BALIZA MÓVILES 17. VALLA (NO BARRERA DE SEGURIDAD) 18. DESPREMIENTOS DE PIEDRA O VEGETACIÓN 19. VEHÍCULO DETENIDO 20. CARGA O ELEMENTOS DE OTROS VEHÍCULOS 21. VEHÍCULOS IMPLICADOS EN ACCIDENTE PREVIO SALIDA DE LA CALZADA 22. SALIDA POR LA DERECHA 23. SALIDA POR LA IZQUIERDA 24. SALIDA EN LÍNEA RECTA 25. CRUCE DE MEDIANA 26. INVASIÓN DE OTRA VÍA O CALZADA 27. RETORNO A LA VÍA	
UNIDADES IMPLICADAS	EVENTOS	SUCESO MÁS GRAVE																																			
Ejemplar 1: <table border="1"><tr><td> </td><td> </td><td> </td></tr></table> Ejemplar 2: <table border="1"><tr><td> </td><td> </td><td> </td></tr></table> Ejemplar 3: <table border="1"><tr><td> </td><td> </td><td> </td></tr></table>												CHOQUE CONTRA ELEMENTOS FIJOS 28. GLORIETA 29. REFUGIO/ISLETA 30. BORDILLO 31. BOLLARDS 32. SEÑAL DE TRÁFICO 33. SETOS, ARBUSTOS 34. ÁRBOL 35. FAROLA O POSTE 36. CONTENEDOR 37. FUENTE O ESTATUA 38. PARADA DE BUS 39. BARRERA DE CONTENCIÓN DE VEHÍCULOS 40. BARRERA DE PASO A NIVEL 41. AMORTIGUADORES DE IMPACTO 42. PASO SALVACUNETAS 43. PUNTE O TUNEL 44. DIQUE, MURO DE CONTENCIÓN 45. CASA, MURO O EDIFICIO 46. MURO DE NIEVE O HIELO 47. ROCA 48. OTROS ELEMENTOS VUELCO, INCENDIO, REVENTÓN, OTRO TIPO 49. GIROS SOBRE SI MISMO 50. VUELTAS DE TONEL O DE CAMPANA 51. VUELCO DEL VEHÍCULO 52. INCENDIO DEL VEHÍCULO 53. DESPEÑAMIENTO 54. INMERSIÓN 55. DESPLAZAMIENTO DE LA CARGA 56. SEPARACIÓN DE UNIDADES DE CARGA 57. DESPREMIENTOS DE CARGA 58. OTRO TIPO DE SUCESO VEHÍCULO IMPLICADO SIN EVENTO 59. SIN EVENTO O IMPLICADO SIN CHOQUE NI COLISIÓN																									
NOTA: El vehículo o peatón que haya intervenido en primer lugar en un evento del accidente se situará en la primera columna de la secuenciación, y así sucesivamente. En el caso de vehículos que han intervenido en el accidente pero no han sufrido directamente las consecuencias del mismo se indicarán en la tabla y se indicará: Evento 59.																																					

Graph 4. Accident sequence. Source: Order INT/2223/2014.

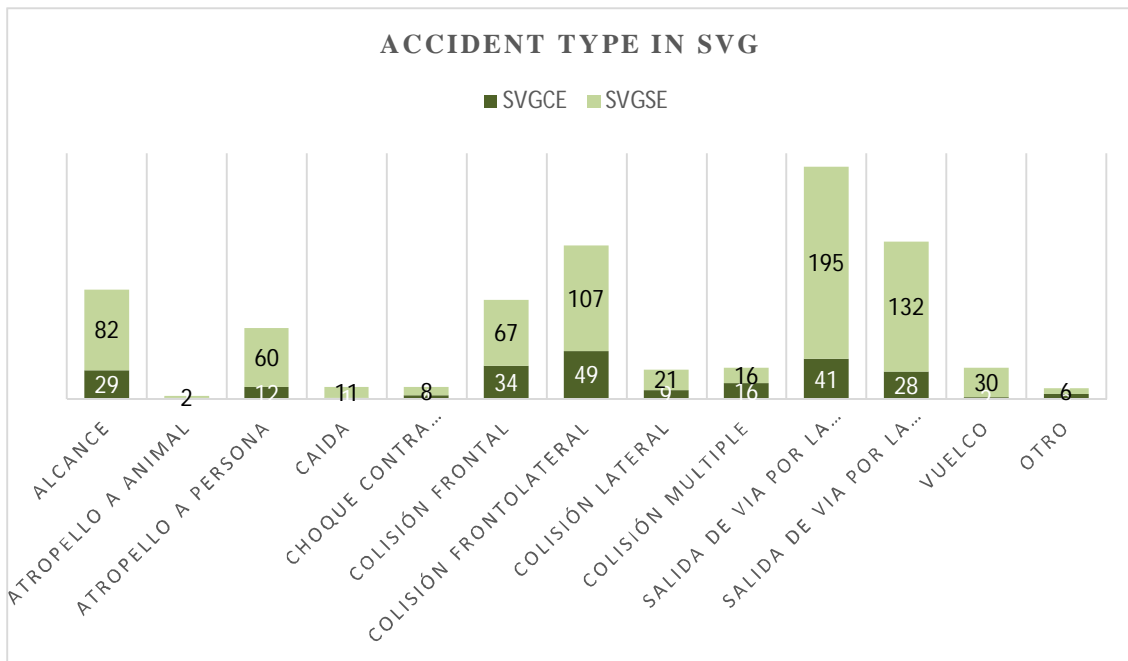
ANALYSIS OF THE ACCIDENT TYPE

When analysing the accident type (AT), the aim is to find out whether there are any accident types in SVGs as a whole that are abnormally frequent among foreign drivers.

For this purpose, we will present the corresponding information in a graph. It will display the absolute frequency of different ATs recorded in the ARENA2 application,

³ ARENA 2 application contents manual

both in the entirety of all SVGs and in SVGs involving a foreign driver (SVGCE), as well as SVGs without a foreign driver involved (SVGSE). Additionally, it will illustrate the relative frequency of each AT within the total of the 968 SVGs under study.



Graph 5. Accident type in SVG by type of driver. Source ARENA2. Prepared internally

As you can see, some ATs had low representation within the set of serious road accidents, rendering their study statistically insignificant. Henceforth, we will focus on examining the six most common ATs: REAR-END COLLISION, PEDESTRIAN COLLISION, HEAD-ON COLLISION, FRONTAL-SIDE COLLISION, RIGHT-SIDE DEPARTURE and LEFT-SIDE DEPARTURE

This way, we can verify that 33.66% (34 out of 67) of the serious road accidents that occurred due to HEAD-ON COLLISION and 31.41% (49 out of 107) of those caused by FRONTAL-SIDE COLLISION occurred with a foreign driver involved in the accident.

Since the type of accident is directly related to the driver at fault for the accident, we will see how often each AT occurred in accidents where foreign drivers were at fault.

As mentioned above, foreign drivers were responsible for 16.94% of all serious road accidents, so in order to find out whether a certain type of accident occurs in a relevant percentage of road accidents with a foreign driver at fault, it is necessary to compare its frequency with this figure.

Table 12. Percentage of AT in SVG with foreign driver involved who is at fault for SV

FREQUENCY OF AT IN SVGCE-RESP			
ACCIDENT TYPE	IN SVGCE RESP	% OF AT ON SVG	IN SVG
REAR-END COLLISION	12	10.81	111
PEDESTRIAN COLLISION	8	11.11	72
HEAD-ON COLLISION	21	20.79	101
FRONTAL-SIDE COLLISION	35	22.44	156
RIGHT-SIDE DEPARTURE	38	16.10	236
LEFT-SIDE DEPARTURE	27	16.88	160
OTHER TYPES OF ACCIDENTS	23	17.42	132
OVERALL	164		968

Source ARENA2. Prepared internally

That said, based on the data presented in the table, we can conclude that in 20.79% of serious road accidents due to HEAD-ON COLLISION and 22.44% of accidents caused by FRONTAL-SIDE COLLISION, a foreign driver was at fault for the accident.

VIOLATION OF THE REGULATIONS

ACTIVITY IN VIOLATION

The road system is mainly made up of the human factor, the infrastructure factor and the vehicle factor, to which we can add the environmental and regulatory factors.

A road accident occurs when there is a failure in one or more of these factors, either due to a voluntary or involuntary action of the driver or a noticeable malfunction of the infrastructure, environment or vehicle conditions.

Clearly, not all factors have the same weight in the cause of road accidents. The human factor is the most important, while other factors are relegated to second place.

At the First UN Global Road Safety Week held from 23-29 April 2007, (Organización Muncial de la Salud, 2006) one of the key messages was "road safety is no accident". Since then, it has been more appropriate to use the term "road accident" rather than "traffic accident" to refer to the "causal" rather than "casual" event that occurs when the disruption to the road system occurs and the accident takes place.

As a prelude to a road accident, on many occasions there are what we can call "incidents", which are events that occur while driving and which constitute dangerous or risky situations that in most cases do not end up causing a road accident, although, if repeated, will probably end up causing one.

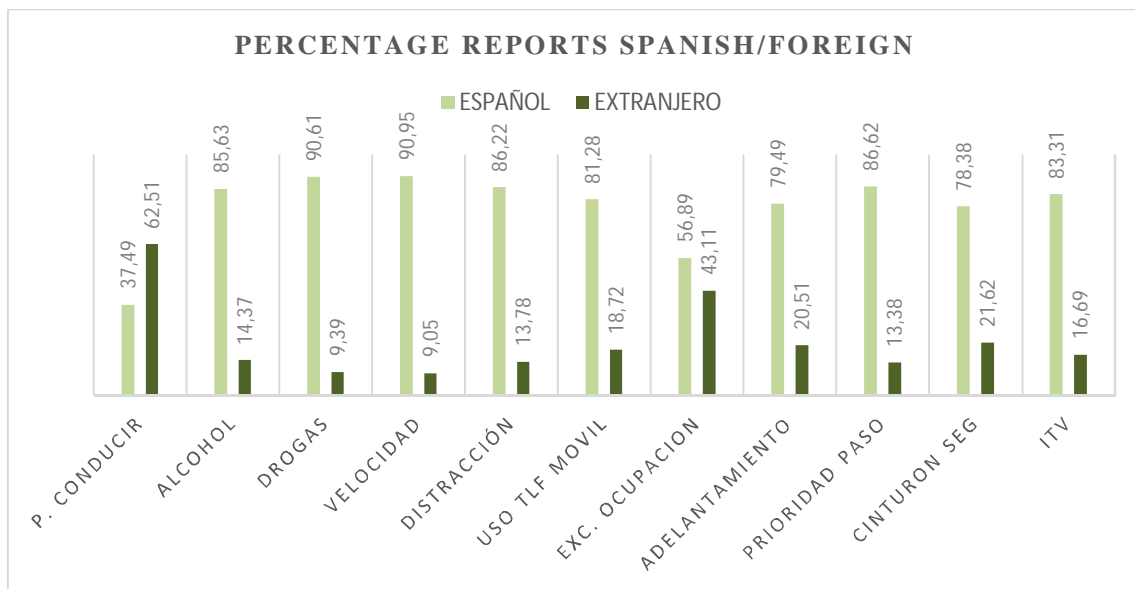
In this section, the aim is to establish whether there is a direct correlation between traffic incidents that occur while driving and the serious road accidents that happen—in other words, between violations of traffic regulations and the occurrence of serious road accidents involving foreign drivers in the Region of Murcia.

As is well known, road traffic violations can be of an administrative or criminal nature, and whether they are of one or the other depends on the seriousness of the reproach that the legislator has considered the action deserves.

VIOLATION OF ADMINISTRATIVE RULE

In order to establish the relationship between administrative violations of road regulations (Road Safety Law and Regulations) and road accidents and their consequences, we studied the frequency of 11 types of offences detected by the Traffic Group of the Civil Guard in the Region of Murcia. Each of the analysed reports is linked to one or several of the most significant concurrent factors in the serious road accidents involving foreign drivers in the Region of Murcia, or with the consequences on victims of these accidents.

The aforementioned study consisted of an analysis of the frequency of these violations on interurban roads in the Region of Murcia between 2014 and 2022, which is shown in the following graph.



Graph 6. Percentage of complaints by type of complaint and type of driver. Source: ATGC. Statistical Studies and Analysis Section. Prepared internally

An analysis of the information shows that 62.51% of the violations for driving without a driving licence are committed by foreign drivers. The data reveals that many foreigners drive in Spain without a valid driving licence. This translates into a lack of skills and knowledge of road regulations, as well as a lack of driving expertise and experience, which often leads to road accidents.

Road accidents in which the foreign driver is at fault and can be linked to this type of violation are those where the CF is associated with lack of skill or unfamiliarity with the rules, such as: inappropriate speed (VEI) where the foreign driver is at fault for 18.58% of the SVGs; failure to yield (NRP) where they ARE responsible for 21.85% of SVGs; or failure to maintain a safe distance (NIS) where they are responsible for 17.86% of SVGs.

In the case of reports for exceeding alcohol limits, these account for 14.37% of the total for foreign drivers. However, the percentage of SVGs involving alcohol-related CF for which the foreign driver is at fault is 25%. This shows a direct correlation between the offending behaviour of the foreign driver and the consequences in the number of SVGs for which they are at fault due to this cause.

Reports of distraction among foreign drivers represent 13.78% under article 18 of the General Traffic Regulations (RGCir) and 18.72% under article 76 of the Road Safety Law (LSV)⁴ (use of a mobile phone while driving). The responsibility of foreign drivers in SVGs associated with this type of violation is 15.35% in CF - Distraction (DIS), 17.86% in failure to maintain a safe distance (NIS), and 23.29% in tiredness or sleepiness (COS), all of which are related to the CF - Distraction.

Concerning reports of over-occupancy, those filed against foreign drivers account for 43.11% of the total, and they hold significance when correlated with the number of victims. Thus, if we say that 17.83% of fatalities and 17.93% of those seriously injured in SVGs were occupants of a vehicle driven by a foreigner, there is a direct link between the offending activity for this reason and the serious consequences of the resulting road accidents.

This section also includes the offence of not wearing a seat belt or CRS (child restraint system) with a percentage of 21.62% of complaints against foreigners (drivers or occupants), which is directly related to the data on fatalities and serious injuries in vehicles driven by foreign drivers involved in SVGs.

In the case of unlawful overtaking where the foreign driver has an offence rate of 20.51%, this is directly proportional to the 28.6% rate of SVGs with CF - Unlawful Overtaking (AAR) for which foreign drivers were at fault.

Regarding reports against foreign drivers for not respecting the right of way, which accounted for 13.38%, these are related to the percentage of 21.89% of SVGs with the concurrent factor of failure to yield (NRP) for which foreign drivers were at fault.

ROAD TRAFFIC VIOLATIONS IN CRIMINAL LAW

Crimes against Road Safety are typified in Chapter IV, Title XVII, articles 379 to 385ter, of Organic Law 10/1995, of 23 November, of the Criminal Code (CC).

Articles 379 to 382 and 354 to 385 of the CC define conducts that are already punished as administrative violations, but which the legislator, taking into account the seriousness of the conduct, has decided to punish more severely in the criminal order. Thus, for instance, Article 379.1 of the Criminal Code defines the same conduct as Articles 76.a and 77.a of the Road Safety Law (Articles 42 to 52 of the RGCir⁵) regarding speeding violations, or Article 379.2 of the Criminal Code defines the same conduct as Articles 14 and 77.c of the Road Safety Law, but in this case, concerning the consumption of alcohol and/or drugs.

⁴ Road Safety Law

⁵ General Traffic Regulations

In other words, the actions that the violations against road safety in the CC penalises are actions that compromise road safety and, as in the case of administrative violations, constitute traffic incidents that are the prelude to the occurrence of a road accident, thus considering that there is a direct relationship between road crime rates and accident rates.

For this reason, we have studied the road crime rates of drivers in general and foreign drivers in particular, in the Region of Murcia and in the rest of Spain (Ministerio del Interior, 2022) Crime Statistics Portal of the Ministry of the Interior.

Table 13. Arrested/investigated road safety violations Spain (period 2014/2021)

ARRESTED/INVESTIGATED CRIMES AGAINST ROAD SAFETY SPAIN	
NATIONALITY ARRESTED - INVESTIGATED	NUMBER
SPANIARDS	223,540
FOREIGNERS	61,815
TOTAL, ARRESTED/INVESTIGATED	285,355
FOREIGNERS AS % OF TOTAL	21.66

Source: Crime Statistics Portal (MI). Prepared internally

Table 14. Arrested/investigated road safety violations R. Murcia (2014/2021)

ARRESTED/INVESTIGATED CRIMES AGAINST ROAD SAFETY MURCIA	
NATIONALITY ARRESTED - INVESTIGATED	NUMBER
SPANIARDS	5,204
FOREIGNERS	2,627
TOTAL, ARRESTED/INVESTIGATED	7,831
FOREIGNERS AS % OF TOTAL	33.55

Source: Crime Statistics Portal (MI). Prepared internally

As can be seen, in the country as a whole, in the period of time indicated, the percentage of foreigners arrested/investigated for road safety violations was 21.66%, while in the Region of Murcia this rose to 33.55%.

CONCLUSIONS

Foreigners account for 14.64% of the population of the Murcia region, 9.54% of registered drivers and 11.24% of all vehicle owners.

75.47% of the driving licences issued in Spain to foreigners have been issued by virtue of the different exchange agreements that exist with their countries of origin. Only 24.53% have been obtained after examination at the corresponding Traffic Headquarters.

A foreign driver was involved in 24.62% of all road accidents with casualties, 23.86% of all serious road accidents and 23.94% of road accidents with fatalities. 16.1% of all drivers or pedestrians involved in a serious road accident were foreigners.

A foreign driver was involved in 33.66% of serious road accidents involving HEAD-ON COLLISION and 31.41% of the serious road accidents involving FRONT-SIDE COLLISION.

A foreign driver was responsible for 16.94% of all serious road accidents, but this percentage increased significantly when the factors FAILURE TO YIELD (21.8%), ALCOHOL (25%) and TIREDNESS OR SLEEPINESS (23.3%) were involved in the accident.

Upon analysing the data regarding responsibility in serious road accidents based on the nationality of the driver, it was observed that nationalities with a significant presence in the region's population, such as Moroccans, Ecuadorians, British, and Romanians, all had a responsibility percentage in serious road accidents that exceeded their population share in the region. Among these, Ecuadorian nationals stood out, as despite representing only 1.16% of the population, they were responsible for 2.89% of the serious road accidents.

As a representative figure, it has been shown that, of all serious road accidents in which the concurrent factor was FAILURE TO YIELD, in 16.81% the driver at fault was of Moroccan or Ecuadorian nationality, and the same occurred in 17.11% of serious road accidents with the concurrent factor ALCOHOL, when between the two nationalities they account for only 7.08% of the population of the region.

In relation to the type of accident, we have learned that in 20.79% of serious road accidents involving HEAD-ON COLLISION and in 22.44% of those involving FRONT-SIDE COLLISION, a foreign driver was at fault for the accident.

Throughout this report, the percentages of fatalities and severely injured individuals resulting from this presence of foreign drivers in road accidents have been calculated. It was found that at least one foreign driver was involved in road accidents in which 27.39% of the fatalities and 27.84% of the serious injuries occurred. 17.83% of fatalities and 17.93% of serious injuries in road accidents occurred among the occupants of a vehicle driven by a foreign driver, and 19.1% of fatalities and 19.93% of serious injuries in road accidents occurred as a result of the 16.94% of road accidents in which the foreign driver was at fault.

With regard to violation of regulations, this study has been able to conclude that there is a direct relationship between the traffic violations committed by foreign drivers and the road accidents for which they are at fault, as well as the consequences of said accidents.

It was found that 14.37% of all drink-driving violations were committed by foreign drivers, who were found to be at fault for 25% of all serious road accidents involving drink-driving. They are at fault for 13.78% of distracted driving violations and 15.35% of serious distracted driving accidents. They are responsible for 18.72% of mobile phone violations while driving and 17.86% of road accidents due to failure to maintain a safe distance (rear-end accident) directly related to distracted driving.

While among occupants of vehicles driven by foreigners there is a percentage of 17.83% fatalities and 17.93% severely injured individuals, these drivers are at fault for

43.11% of infractions related to over-occupancy and 21.62% of seatbelt violations. While foreign drivers are responsible for 13.38% of the violations for not respecting the right of way, they are at fault for 21.89% of all serious road accidents that occur for this reason.

In relation to road crime, it was found that in the Region of Murcia foreigners account for 33.55% of all road offenders who have been investigated or arrested. In Spain, this percentage is 21.66%.

It is all this offending activity that could explain the high rates of involvement of foreign drivers in road accidents, the high rates of responsibility for road accidents and the high fatality and injury rates suffered by the occupants of vehicles driven by foreigners.

PROPOSALS

This study has shown that on many occasions there is a marked disproportion between the data referring to the presence of foreigners in the Region of Murcia (residents, drivers, etc.) and those corresponding to the accident rate and the factors surrounding it.

To blame this disproportion on inadequate training of foreign drivers would be very risky without more precise data to justify this assertion.

However, training being precisely one of the "strategic areas" of the Road Safety Strategy 2030 (trained and capable people), it would be advisable to review the Driving Licence Exchange Agreements that Spain has with some countries and analyse whether driver training in those countries is really comparable to that provided in Spain and whether it is effectively supervised and controlled by authorities that are in a position to prevent fraud in obtaining driving licences.

Elsewhere, given that, in many cases, foreigners living in the Region of Murcia settle in more or less closed communities that are mostly made up of their own compatriots, the results of this study could serve as a tool for the police in charge of traffic surveillance to establish road safety surveillance in these places to correct specific violations, which would make it more effective.

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