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Analysis of traffic incidents involving Emergency Response Teams of the Voivodeship Emergency Medical Services Independent Public Healthcare Facility (WPR SP ZOZ) in Lublin between 2011 and 2014

Analiza zdarzeń drogowych z udziałem Zespołów Ratownictwa Medycznego Wojewódzkiego Pogotowia Ratunkowego Samodzielny Publiczny Zakład Opieki Zdrowotnej (WPR SP ZOZ) w Lublinie w latach 2011-2014

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Abstract

Background: Given the type and environment of the performed work, paramedics may be exposed to a variety of injuries or hazards not only to health, but also to life. As it is well known, going in an "emergency" ambulance poses a real threat to road safety. **Aim of the study:** Analysis of traffic incidents involving Emergency Response Teams (ZMR) of the Voivodeship Emergency Medical Services Independent Public Healthcare Facility (WPR SP ZOZ) in Lublin between 2011 and 2014. **Material and method:** The research was conducted by a method of retrospective analysis of documentation, in accordance with the "List of damages and communication events involving the vehicles of WPR SP ZOZ in Lublin in claims for third party liability insurance (OC) and comprehensive coverage (AC)". **Results:** The analysis of the material showed 140 traffic incidents involving Emergency Response Teams of the WPR SP ZOZ in Lublin. The largest number of traffic incidents were recorded in 2011 - 36.44% (n=51), then in 2012 - 23.57% (n=33). In previous years the number of traffic incidents was: in 2013 - 20.71% (n=29) and in 2014 - 19.28% (n=27). For 140 traffic incidents, a traffic incident was caused by a member of a ZRM team in as much as 59.28% (n=83) of cases. In 20.72% (n=29) of cases of traffic incidents involving ZRM team, they were caused by other road users. The analysis showed that 110 damages to the ambulance were located at the front of the vehicle and 120 - at the back. 1 damage to the inside of an ambulance was recorded, and it was caused by an aggressive patient. **Conclusions:** The total of 140 traffic incidents involving ZRM teams was observed in the analyzed period between 2011 and 2014, however, the number of events was lower each year. Perpetrators of traffic incidents involving ZRM teams were, first of all, ambulance team members, and then, other road users.

Key words: road accident, emergency response team, work, injury

Streszczenie

Wstęp: W związku z rodzajem wykonywanej pracy i środowiskiem jej wykonywania ratownicy medyczni mogą być narażeni na różnorakie obrażenia lub zagrożenia nie tylko zdrowia, ale i życia. Jak wiadomo, poruszanie się ambulansem medycznym w trybie "uprzywilejowanym", stwarza realne zagrożenie w ruchu drogowym. **Cel pracy:** Analiza zdarzeń drogowych z udziałem Zespołów Ratownictwa Medycznego (ZRM), Wojewódzkiej Stacji Pogotowia Ratunkowego Samodzielny Publiczny Zakład Opieki Zdrowotnej (WPR SP ZOZ) w Lublinie w latach 2011-2014. **Materiał i metoda:** Badania przeprowadzono metodą analizy retrospektywnej dokumentacji według "Wykazu szkód i zdarzeń komunikacyjnych z tytułu OC i AC z udziałem pojazdów WPR SP ZOZ w Lublinie". **Wyniki:** Analiza zgromadzonego materiału wykazała 140 zdarzeń drogowych z udziałem Zespołów Ratownictwa Medycznego WPR SP ZOZ w Lublinie. Największa liczbę zdarzeń drogowych odnotowano w 2011 roku - 36,44% (n=51), następnie w roku 2012 - 23,57% (n=33). W pozostałych analizowanych latach liczba zdarzeń drogowych wynosiła: 2013 rok - 20,71% (n=29) a w 2014 roku - 19,28% (n=27). Spośród 140 zdarzeń drogowych, aż w 59,28% (n=83) kolizja drogowa była spowodowana przez pracownika ZRM. W przypadku 20,72%

(n=29) zdarzeń drogowych z udziałem ZRM sprawcą był inny uczestnik ruchu drogowego. Jak wynika z analizy, 110 uszkodzeń karetki dotyczyło jej przodu, a 120 - tyłu pojazdu. Odnotowano 1 uszkodzenie wnętrza ambulansu spowodowane przez agresywnego pacjenta. **Wnioski:** W analizowanym okresie w latach 2011-2014 odnotowano łącznie 140 zdarzeń drogowych z udziałem ZRM, jakkolwiek zaobserwowano każdorocznie spadek takich zdarzeń. Sprawcami zdarzeń drogowych z udziałem ZRM na pierwszym miejscu byli pracownicy ambulansu, a dopiero w drugiej kolejności inni uczestnicy ruchu drogowego.

Słowa klucze: wypadek drogowy, zespół ratownictwa medycznego, praca, uraz

Introduction

Each country has its own health care system driven by appropriate ideology, however, the aim of such an institution and the fields of its operation are the same - to save human life and health. The profession of a paramedics, who is the first link in the chain of rescue of the victim, has appeared in our healthcare system relatively recently.

Professional activity of a paramedic not only involves accomplishment of professional tasks, primarily the activities aimed at securing the persons in the place of the event, whose life is directly threatened, but also preventing the increase in the number of victims of the event and degradation of the environment. Further tasks of a paramedic are as follows: assessment of the state of health of persons whose life may be threatened, transportation of victims, continuous communicating with the injured or witnesses and psychological support of the participants of the event. Apart from the aforementioned tasks, a paramedic carries out education on first aid, qualified medical aid and medical rescue procedures. The provisions of the Act on State Medical Rescue, in the section concerning the profession of a paramedic, impose on persons performing this profession the obligation to continuously improve and add new qualifications by participating in various forms of postgraduate education, in accordance with current medical knowledge and practice [1].

Pursuing any profession involves exposure to factors which are harmful to health or even life-threatening. Those factors may lead to development of occupational diseases or be the cause of accidents at the workplace [2].

In the case of a paramedic, it is difficult to determine the workplace, and the literature uses the term 'area of action', because a paramedic performs his or her professional tasks in out-of-hospital emergency response teams (Zespoły Ratownictwa Medycznego - ZRM). The size of the area depends on: location, population density, demand for rescue services. For operational reasons, ZRM teams can be located in smaller substations, which significantly shortens the time to reach the injured [2,3].

Traffic incidents are among the most significant hazards in the profession of paramedics. Among the factors contributing to the adverse consequences of road events involving medical ambulances in Poland are the regulations of the Traffic Code, which allow the driver of an emergency vehicle (with special caution) not to comply with traffic regulations, as well as signs and traffic signals, including traffic lights. [4].

It should be emphasized that the driver of such a vehicle is not exempted from observing the signals given by traffic controllers. On the other hand, all road users are obliged

to facilitate the passage of a privileged vehicle by, for example, immediate going off its way or stopping, if necessary. Unfortunately, Polish road users often react incorrectly (or do not react at all) when a privileged vehicle approaches [5].

Broader analysis shows that road hazards in the traffic relevant to ZRM teams are mainly the results of: an increase in the number of vehicles on the roads, the poor technical condition of roads and vehicles, improper marking of communication routes, carelessness, deficits in training and non-compliance with road traffic regulations by road users, lack of information on companies transporting hazardous materials and associated lack of supervision and control of road transport of such substances [6].

The area of operation of a paramedic is not limited. It can include private apartments, offices and service facilities, streets and highways, forests and fields, and any other place where people need immediate medical aid. The only requirement for a paramedic to be able to undertake medical rescue activities is the safety on the site of the incident. There are virtually no limitations to where paramedics can provide aid [3]. Also various factors, shown in Figure 1 may present a risk in the work of a paramedic.

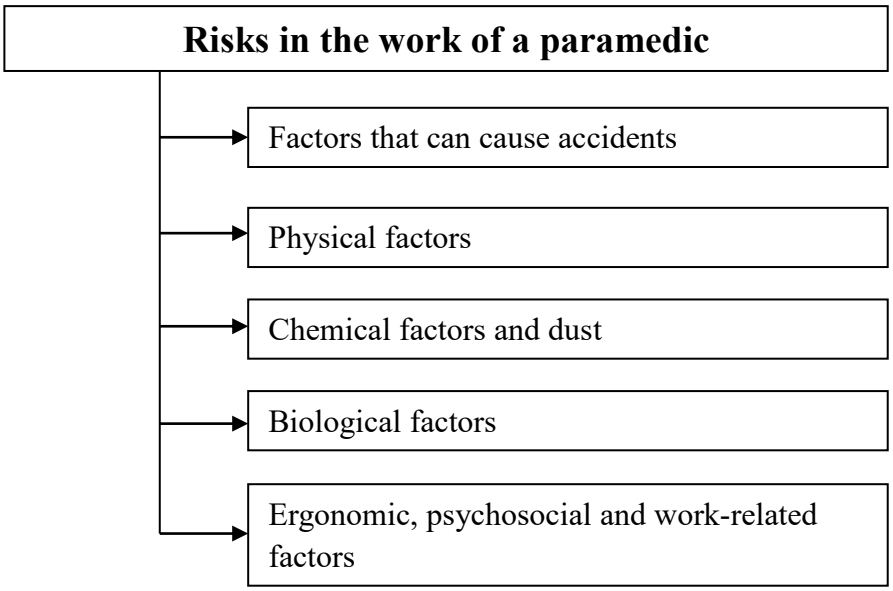


FIG. 1. RISKS IN THE WORK OF A PARAMEDIC
(OWN STUDY BASED ON: CENTRAL INSTITUTE FOR LABOUR PROTECTION - A PARAMEDIC. HTTPS://WWW.CIOP.PL/CIOPPORTALWAR/APPMANAGER/CIOP/PL?_NFPB=TRUE&_PAGELABEL=P720014285134054 5953779&HTML_TRESC_ROOT_ID=19019&HTML_TRESC_ID=300002034&HTML_KLUCZ=19019&HTML_KLUCZ_SPIS=, ACCESS ON: 21.10.2017)

Aim of the study:

The aim of this study is to analyse traffic incidents involving Emergency Response Teams of the Voivodeship Emergency Medical Services Independent Public Healthcare Facility (WPR SP ZOZ) in Lublin between 2011 and 2014.

Material and method:

The study took the form of a retrospective analysis of 140 road events with participation of the Medical Rescue Teams of the Voivodeship Emergency Medical Services Independent Public Healthcare Facility in Lublin in the period from 1 January 2011 to 31

December 2014. The following documentation was analysed: "List of damages and traffic incidents involving the vehicles of WPR SP ZOZ in Lublin in claims for third party liability insurance (OC) and comprehensive coverage (AC)".

Detailed analysis of traffic events was carried out with regard to: location of the incident, perpetrator of the incident and extent of damage to the ambulance. The consent of the Director of the Voivodeship Emergency Medical Services of the Independent Public Healthcare Facility in Lublin was obtained.

The area of activity of WPR SP ZOZ in Lublin includes: municipality of Lublin, Lublin district (following municipalities: Garbów, Głusk, Jastków, Konopnica, Niemce and Wólka), Puławy district (municipality of Markuszów), Świdnik district, Krasnystaw district (municipality of Fajslawice), Łączna district (following municipalities: Cyców, Ludwin, Łęczna, Milejów and Puchaczów) and Kraśnik district.

Results

During authors' own research 140 traffic incidents involving Emergency Response Teams in the period from 1 January 2011 to 31 December 2014 were analysed . The largest number of traffic incidents was recorded in 2011 - 36.44% (n=51), then in 2012 - 23.57% (n=33). In the remaining years the number of traffic incidents was: in 2013 - 20.71% (n=29) and in 2014 - 19.28% (n=27). The largest number of traffic incidents involving ZTM teams was recorded in August 2012 - 6.43% (n = 9), then in January and February 2011 - 5% (n = 7). No traffic incidents involving emergency response teams were recorded in April 2012 and July 2014. Detailed data is presented in Figure 1.

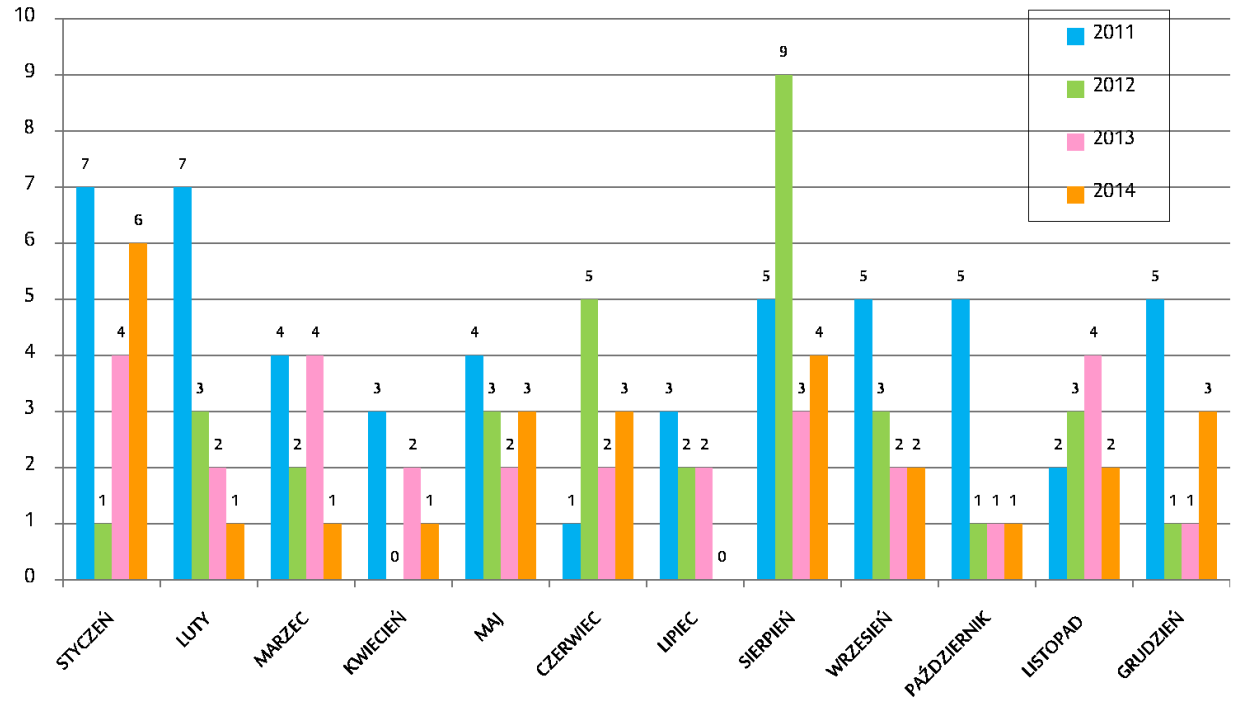


FIG. 1. THE INCIDENCE OF TRAFFIC INCIDENTS INVOLVING ZRM TEAMS IN RELATION TO THE MONTHS IN THE YEARS 2011-2014.
(Own elaboration)

Out of 140 analysed events involving ZRM teams, 65.71% (n = 92) took place in the city of Lublin, 5% (n = 7) in Łęczna, and both 3.57% (n = 5) took place in Kraśnik and Świdnik (Figure 2).

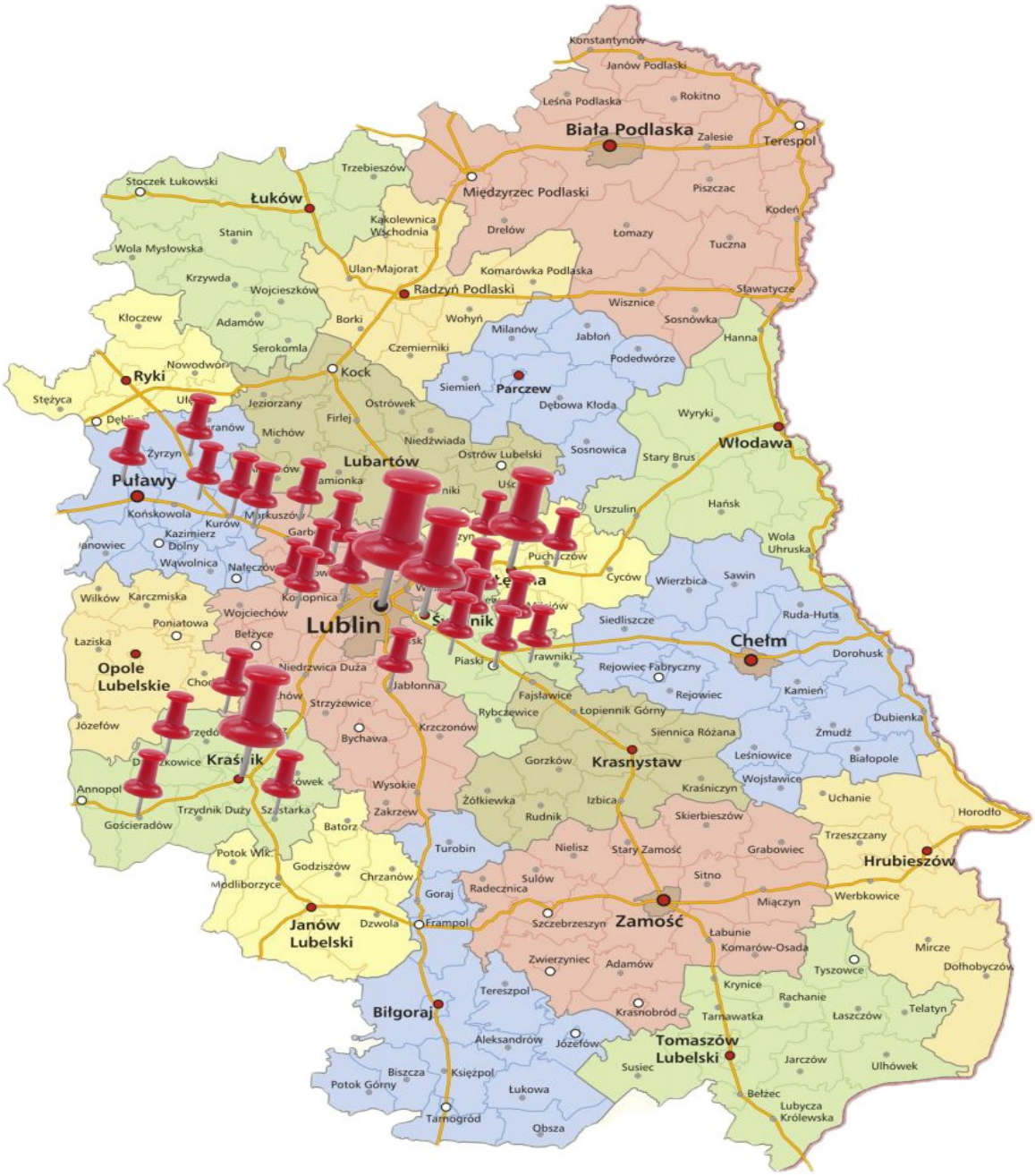


FIG. 2. LOCATION OF TRAFFIC INCIDENTS INVOLVING ZRM TEAMS IN THE AREA OF OPERATION OF WPR SP ZOZ IN LUBLIN.

Out of 92 traffic incidents that occurred in the city of Lublin up to 31.52% (n = 29) occurred the districts of Śródmieście, Wieniawa and Rury, 13.04% (n = 12) occurred in the district of Czechów, and 9.78% (n = 9) in the district of Dziesiąta. The lowest percentage - only 1.08% (n = 1) was recorded in the district of Za Cukrownią 2.17% (n = 2) each in the districts of: Głusk and Abramowice, Hajdów-Zadębie, Felin, Wrotków and Węglin. Due to deficiencies in the analysed documentation, 8 incidents within the city of Lublin could not be located. Details are presented in Figure 3.

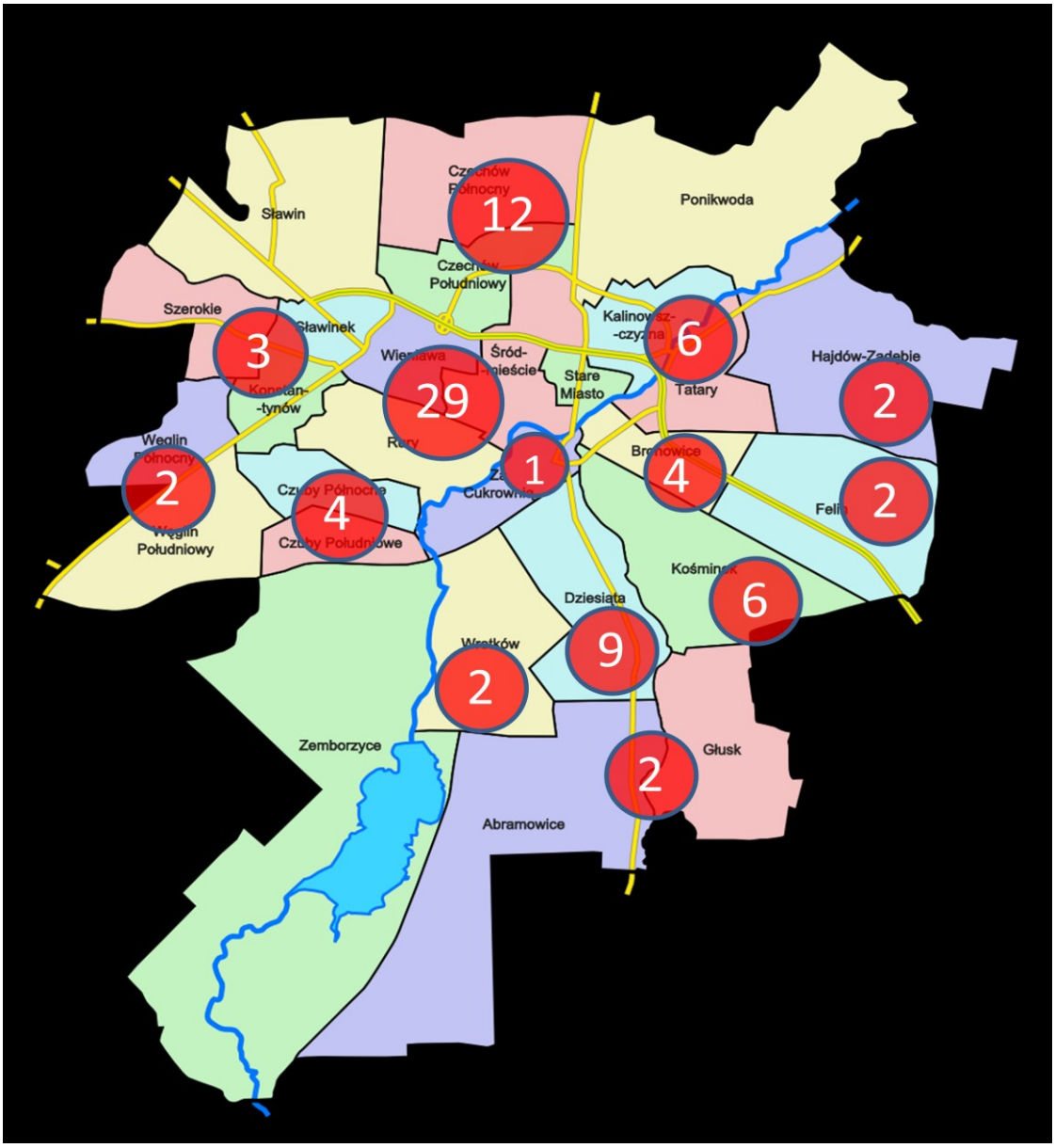


FIG. 3. LOCATION OF TRAFFIC INCIDENTS INVOLVING ZRM TEAMS IN THE CITY OF LUBLIN.
(OWN ELABORATION)

At a later stage the researchers analysed who were the perpetrators of road collisions involving ZRM teams. Out of 140 traffic incidents, in as much as 59.28% (n=83) of cases the collision was caused by a ZRM driver. In the case of 20.72% (n = 29) of traffic incidents

involving ZRM teams, the other road user was the perpetrator, in 8.57% (n = 12) of cases the perpetrator's identity could not be determined, and in 7.14% (n = 10) of cases the event occurred as a result of an unfortunate coincidence. 2.86% (n = 4) of the traffic incidents involving ZRM teams were caused by a third and only 1.43% (n = 2) was caused the patient taken by the ambulance (Figure 4).

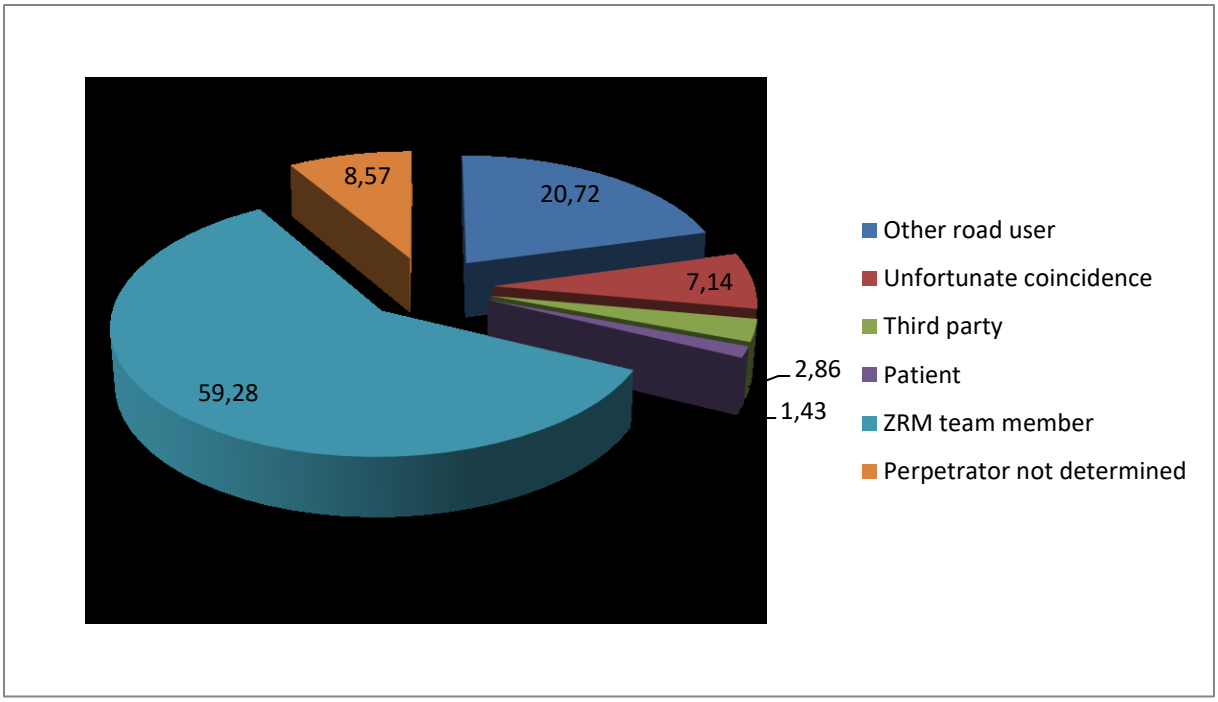


FIG. 4. DIVISION OF INCIDENTS INVOLVING EMERGENCY RESPONSE TEAMS ACCORDING TO THE PERPETRATOR.
(Own elaboration)

Figure 5 shows the locations of damages to the ambulance. The analysis shows that 110 damages to the ambulance were located at the front of the vehicle, and 120 - at the back. 1 damage to the inside of an ambulance was noted, and it was caused by an aggressive patient.

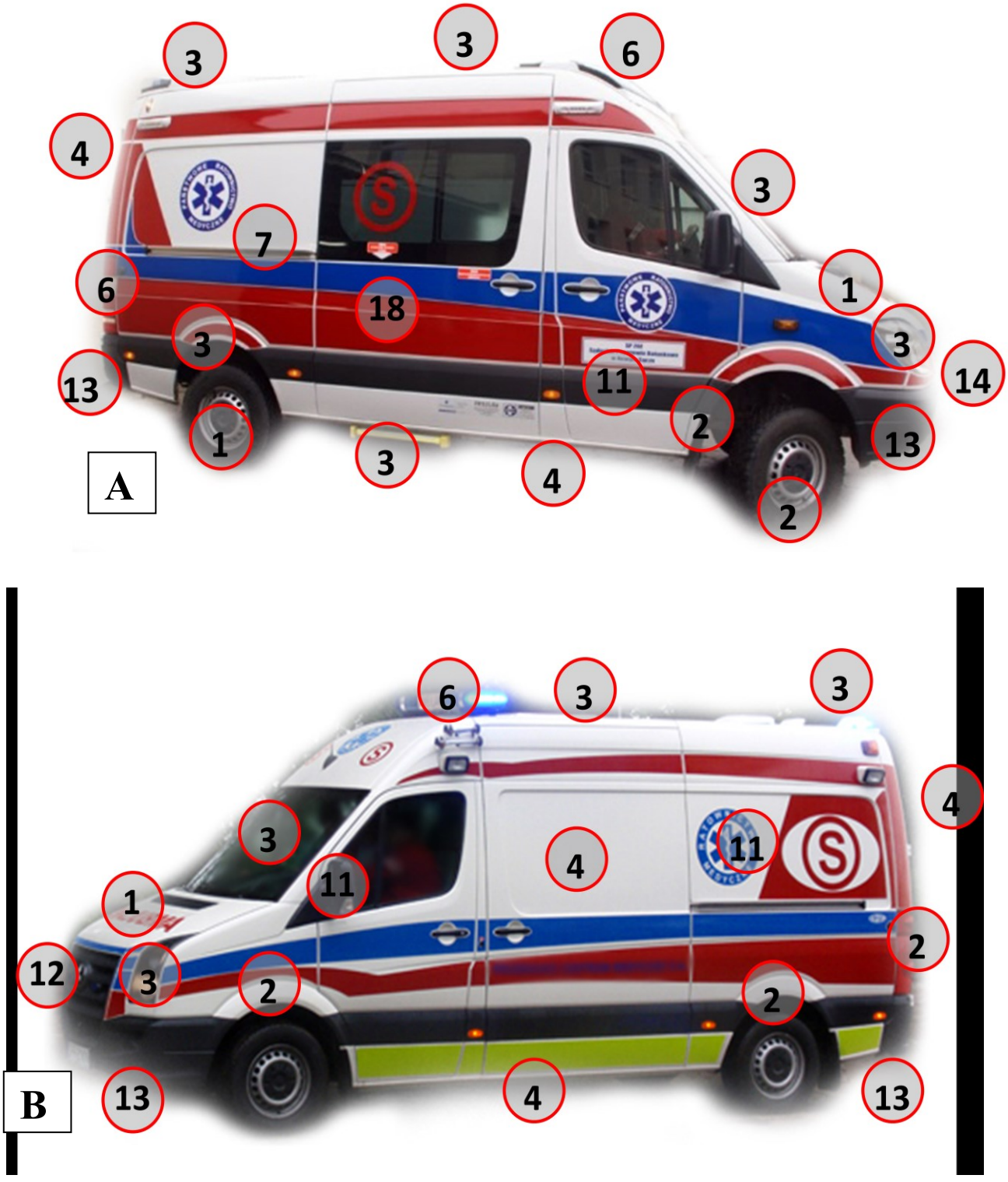
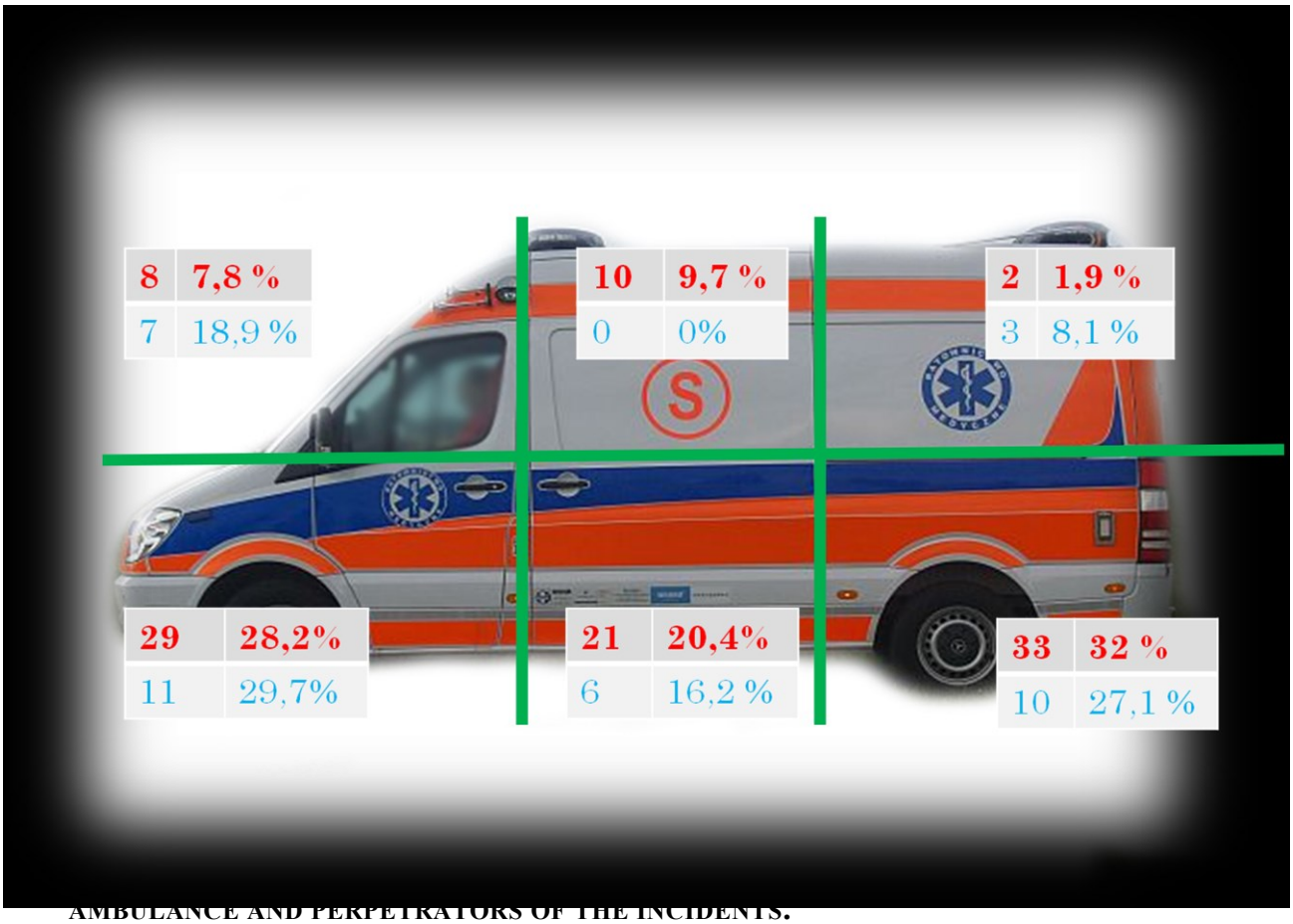


FIG. 5. LOCATION OF DAMAGES TO THE AMBULANCE A - RIGHT SIDE VIEW OF THE VEHICLE, B - LEFT-SIDE VIEW OF THE VEHICLE.
(Own elaboration)

Analysis of the location of damages to the ambulance and the perpetrator of the road incident involving emergency response teams shows the total number of damages located at the front of the ambulance is 55 and 37 of them were caused by a ZRM team driver, and 18 by other road users. There were 37 damages located in the central part of the ambulance, and 21 of them were caused by a ZRM team driver and 6 by other road users. The rear part of the ambulance was damaged 48 times, and the ambulance was damaged by a ZRM team driver 35 times and by another road user - 13 times (Figure 6).



AMBULANCE AND PERPETRATORS OF THE INCIDENTS.

(Own elaboration)

Legend: red - a ZRM member; blue - other road user.

Discussion

In the presented paper, the authors focused on presenting the statistics of accident cases of ZRM teams of the SP ZOZ in Lublin. In spite of the fact that in Poland the events involving ZRM teams are each time recorded in media, they are not included into formal analyzes or research. Moreover, no statistics on the victims and the injured among the medical personnel or patients in medical compartment are kept [7].

There are over 20 million cars on Polish roads, and each day mass media inform about more or less tragic road incidents. Not only pedestrians but only but also cyclists and other vehicles, which include emergency vehicles, are participants of road incidents. Among the risk factors of occurrence of a traffic incident involving an ambulance the most important is high speed, driver distraction, haste, emergence of stress factors (severe condition of the

patient), no airbags in medical cabin, no or weak security belts and unsecured and heavy emergency medical equipment [8].

Given the type and environment of the performed work, paramedics may be exposed to a variety of injuries or hazards not only to health, but also to life. As is known, going in an privileged ambulance creates a real threat on the road not only to other road users, pedestrians on the roadside, road and pavements but also to the driver and other people on board of the privileged vehicle. We are talking here not only about police officers, fire-fighters, doctors, nurses and paramedics, but also about people who are in the vehicle, not performing any of the mentioned professions - the detained, transported or injured. They all depend on the situation on the road and in one instant their condition may radically change, for example from a person providing assistance to a person who needs it. Occupational hazard in the work of a paramedic not always includes just going to the patient, providing first aid and returning with the patient "on board" or directly to the base. It also involves risks associated with patients themselves, their behaviour or behaviour of bystanders or the ambulance equipment. The dangers arise from different situations and health care workers, depending on the situation, should be able to find the way out of the situation, act so that no one gets harmed and continue their work so that the others get the assistance they need.

When focusing on the most important problem analysed in this study, we see that despite the fact that ambulance drivers are the main perpetrators of the incidents involving ambulances, fortunately none of those incidents posed a threat to life and health of people inside or near the ambulance. Therefore, based on the analysis of documentation, we may conclude that such events include mainly parking lot accidents, abrasions caused by various obstacles. These are not serious damages, but they occur. They could be avoided, but they often occur and will occur during actions carried out in haste and stressful situations, due to the conditions the rescue team is working in a given moment. According to the data obtained from the police, between 2011 and 2014, in the whole country, there were 147 928 accidents that caused 14 319 deaths and 181 897 injuries. 111 privileged vehicles were damaged in those accidents and they lead to injuries in people on those vehicles [9].

We notice a decrease in accidents rate both in the police statistics from 2011 to the present as well as in the statistics of WPR SPP ZOZ in Lublin. In the 4-year-period period between 2011 and 2014, the decline was by almost a half - 47% so this is an optimistic forecast for the coming years. The lowest numbers of collisions were recorded in the second and fourth quarters of the analyzed years.

Although injuries incurred during traffic incidents have not been analyzed in this study (lack of relevant documentation), it should be emphasized that the severity of injuries in traffic accidents depends on the speed of the moving vehicle, mechanism of the accident, technical condition of the vehicle, weather conditions and using of the seat belts. According to the literature, improvement of the safety of people in the ambulance can be obtained by: change in the layout of the medical cabin and the way of fixing medical equipment [7,8]. Another important issue is systematic training, of both those who are entitled to drive a privileged vehicle (in the scope of health and safety regulations but also of dealing with difficult situations), as well as of other road users, who should be trained at the driving course stage.

Conclusions

A privileged vehicle participating in traffic is a serious threat to road users. In Poland there are no separate statistics on accidents involving privileged vehicles, their causes and effects. The total of 140 traffic incidents involving ZRM teams has been observed in the analysed period between 2011 and 2014, however, the number of events was lower each year. Perpetrators of traffic incidents involving ZRM team were, first of all, ambulance drivers, and then, other road users. During the analyzed period, the highest number of traffic incidents was observed in winter months and in the districts of the city of Lublin, where heavy traffic generates.

It would be advisable to introduce detailed statistics on traffic incidents involving Medical Rescue Teams, with particular regard to their causes. Such data could be used during ambulance driver training. Moreover, equipping ambulances with new technical solutions like seat airbags, that would protect the staff from the effects of injuries in case of an accident, would improve safety of the emergency response teams members.

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