

MARZENA PAWIŃSKA¹, JACEK A. PIĄTKIEWICZ¹, MAGDALENA ZALEWSKA¹,
JACEK JAMIOŁKOWSKI¹, ANDRZEJ SZPAK¹, BOGUMIŁ MATWIEJUK², ADAM CZERWIŃSKI²

Ofiary wypadków drogowych w województwie podlaskim w latach 2000-2006

Streszczenie

Wstęp. Wypadki drogowe powodują liczne poważne skutki: zdrowotne (cierpienie fizyczne związane z urazem ciała), psychiczne (żał po stracie bliskich) oraz ekonomiczne (straty materialne związane z uszkodzeniem pojazdu, kosztami leczenia i rehabilitacji, opłat ubezpieczeniowych).

Cel. Celem pracy było scharakteryzowanie ofiar wypadków drogowych z województwa podlaskiego w latach 2000-2006.

Materiał i metody. Przedmiotem analizy były dane z „Karty Wypadków Drogowych” z Biura Prewencji i Ruchu Drogowego Komendy Głównej Policji w Białymstoku. Ogółem poddano analizie 9271 „Kart” z lat 2000-2006.

Wyniki. W latach 2000-2006 w województwie podlaskim liczba wypadków drogowych zmniejszyła się o 25,7%, a liczba poszkodowanych w wypadkach zmniejszyła się o 22,1%, podczas gdy liczba zgonów w wypadkach drogowych pozostała na stałym poziomie (przy pewnym wzroście liczby zgonów w miejscu wypadku). Jednakże liczba poszkodowanych w wypadkach zmniejszyła się w sposób istotny. Średnia liczba ofiar wypadków była o 5% wyższa niż przeciętna w Polsce. Mężczyźni stanowili dominującą grupę, zarówno wśród ofiar wypadków (ponad 60%), jak i wśród zabitych (74,7% – śmierć w okresie do 30 dni po wypadku; 82,1% – śmierć na miejscu). Procentowy udział w wypadkach drogowych wzrósł w przypadku kierowców, a zmniejszył się w przypadku pieszych oraz pozostawał na stałym poziomie wśród pasażerów. Młodzi ludzie (20-29 lat) stanowili największą grupę ofiar wypadków, a liczba zgonów była większa w grupie wiekowej 40-49 lat.

Wnioski. Bezpieczeństwo na drogach w województwie podlaskim przedstawia się niekorzystnie na tle innych województw w kraju. Statystycznie, Polska zajmuje czołowe miejsce na świecie w związku z poważnymi wypadkami drogowymi i ryzykiem śmierci z nimi związanym. Jednym ze strategicznych celów programu NFZ 2007-2015 jest zmniejszenie liczby śmiertelnych wypadków w latach 2000-2006. Realizacja tego celu może być szczególnie utrudniona w województwie podlaskim, gdzie liczba śmiertelnych wypadków przedstawia tendencję wzrostową. Wielokierunkowe działania, obejmujące promocję zdrowia, prewencję, organizację i finansowe wsparcie różnych instytucji będą niezbędne do zmniejszenia liczby śmiertelnych wypadków do poziomu porównywalnego w innych województwach, a zwłaszcza w innych krajach UE.

Wypadki drogowe pozostają poważnym zagrożeniem zdrowia publicznego w Polsce, a w szczególności w województwie podlaskim.

Słowa kluczowe: wypadek drogowy, kierowca, karta zdarzenia, ranny, zabity, bezpieczeństwo ruchu drogowego.

Road casualties in podlaskie voivodeship in the years 2000-2006

Summary

Introduction. Road accidents have a number of serious consequences: health-related (physical suffering due to body injury), mental (grieving after a loss of close relatives) and economic (material losses connected with car damage, costs of treatment and rehabilitation, insurance payments).

Objective. The study objective was to characterize road accident victims in Podlaskie Voivodeship in the years 2000 - 2006.

Materials and methods. Source data of the Voivodeship Police Headquarters in Białystok recorded in the “Road Accident Chart” were subjected to analysis. A total of 9,271 “Charts” from the years 2000-2006 were investigated.

Results. In the years 2000–2006 in Podlaskie Voivodeship, the number of road accidents decreased by 25.7% and the number of casualties was reduced by 22.1%, whereas the number of traffic deaths remained constant (with a certain increase in the number of the dead at the site of the accident). However, the number of injured casualties decreased considerably. The mean number of casualties per accident was by 5% higher than the Polish average. Men were the predominant group both among the injured casualties (over 60%) and the killed (74.7% – death up to 30 days; 82.1% – death on the spot). The involvement (%) in road accidents increased in the case of drivers, decreased for pedestrians and remained stable among passengers. Young people (20-29 years old) represented the largest group of casualties, and the number of deaths was found to be increased also in the 40-49 years group.

Conclusion. Road traffic safety in Podlaskie Voivodeship compares unfavourably against other voivodeships in the country. Statistically, Poland occupies a leading position in the world in the severity of road accidents and risk of death in such an accident. One of the strategic objectives of the National Health Program 2007-2015 is to reduce the incidence of injuries due to accidents and their sequels. Taking into account the number of traffic fatalities in the years 2000-2006, accomplishment of this aim may be particularly difficult in Podlaskie Voivodeship, where the number of dead casualties shows a growing tendency. Multifunctional actions covering health promotion, prevention, organization and financial contribution of various institutions will be necessary to reduce the number of road fatalities to the level comparable to other voivodeships and especially to other EU countries.

Road accidents remain a serious threat to public health in Poland, especially in Podlaskie Voivodeship.

Key words: road accident, driver, road accident chart, the injured, the killed, road traffic safety.

¹ Public Health Department, Medical University of Białystok

² The Voivodeship Police Headquarters in Białystok

INTRODUCTION

Road accidents involve a number of serious consequences: health-related (physical suffering due to body injury), mental (grieving after a loss of close relatives) and economic (material losses connected with car damage, costs of treatment and rehabilitation, insurance payments). Due to dynamic development of motorization, road traffic safety has become one of the priority problems of public health. Analyses conducted by the World Bank, European Committee and Nordic Council for Road Traffic Safety have revealed very unfavourable situation of road traffic safety in Poland, as compared to other countries of Western Europe [1]. The subject of the study is the situation in road traffic safety in Podlaskie Voivodeship, where the fatality rate per 100 road accidents is the highest in Poland [2].

OBJECTIVE

The study objective was to characterize road casualties in Podlaskie Voivodeship in the years 2000-2006.

MATERIAL AND METHODS

Source data of the Voivodeship Police Headquarters in Białystok included in the "Road Accident Chart" were subjected to analysis. The chart is a double-sided form consisting of the heading part, sketch of the accident site and 12 tables [3]. It is filled by the policeman who has inspected the accident scene and established all accident circumstances, time, place, surroundings, characteristics of accident participants and vehicles [4]. Data from the charts are put in the Polish State Police Accident Database (Sewik).

In the first phase of the study, charts that referred to road accidents were selected from among all those stored in Sewik database. Road accident is an event involving human casualties, including the offender, irrespective of how the accident ends [3]. Thus, the information about casualties (injured or/and killed) seems to be the criterion distinguishing road accident from collision. After a preliminary selection, a total of 9,271 charts from the years 2000-2006 were chosen for analysis, which was based on the injury classification system designed by the Main Police Headquarters [3]:

- 1) road fatality means any person killed immediately or dying within 30 days as a result of a road accident and sustained injuries;
- 2) severely injured is a person who has sustained severe disability, incurable disease or chronic life-threatening disease, permanent mental disorder, total or partial incapacity to work in a profession or permanent body marring/deformation and traumas, including fractures, damage to internal organs, serious cuts and lacerations;
- 3) lightly injured is a person who has sustained an injury (other than the severely injured) that disturbs functioning of body organs or health breakdown lasting no longer than 7 days, as certified by a physician.

For the needs of this paper, the following data were used from the charts: accident-related data from the heading section and information characterising accident participants from table X. The analysis covered the number of road accidents, the number of severely and lightly injured in road accidents, the number of casualties who died on the spot and

those who died within 30 days after the accident, age and gender of victims, data concerning the casualties as traffic participants. Moreover, concerned legal acts and available literature reports have been discussed.

RESULTS

In the years 2000-2006 in Podlaskie Voivodeship, the incidence of road accidents showed a systematic decrease from 1,530 in the year 2000 to 1,137 in 2006, which means a 25.7% drop in the number of accidents within a 7-year period. The total number of road casualties in Podlaskie Voivodeship in the study period decreased from 2,100 people in the year 2000 to 1,636 in 2006, which indicates a 22.1% reduction (Table 1).

TABLE 1. The number of road accidents and casualties in Podlaskie Voivodeship in the years 2000-2006.

Year	No of accidents	Change as compared to the year 2000 in %	No of casualties	Change as compared to the year 2000 in %
2000	1530	100	2100	100
2001	1401	- 8.4	1901	- 9.5
2002	1448	- 5.4	2082	- 0.9
2003	1354	- 11.5	1945	- 7.4
2004	1219	- 20.3	1763	- 16
2005	1182	- 22.7	1696	- 19.2
2006	1137	- 25.7	1636	- 22.1

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

In the study period, the mean number of road casualties in the province as calculated per one accident was found to increase from 1.37 in the year 2000 to 1.44 in 2002 (by 5.9%) and since that time has remained constant: 1.42-1.45 person per accident. In Poland, throughout the study period, the mean number of casualties per accident oscillated between 1.36 and 1.38. Thus, in the years 2002-2006 in Podlaskie Voivodeship, the mean number of road casualties per one accident was approximately by 5% higher as compared to the Polish average (Figure 1).

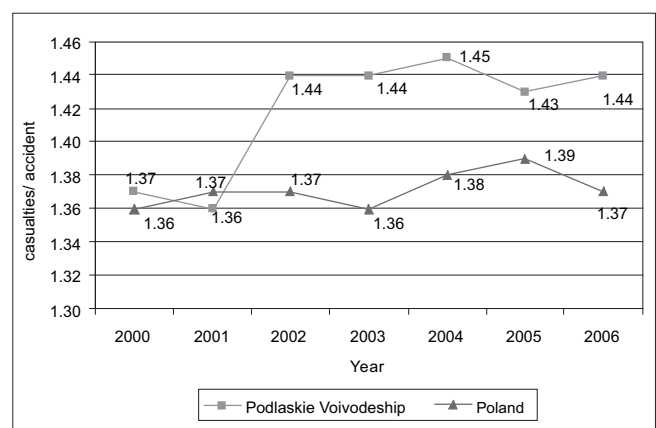


FIGURE 1. The mean number of road casualties in Podlaskie Voivodeship in the years 2000-2006 per one accident.

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

The total number of drivers, pedestrians and passengers affected in road accidents in Podlaskie Voivodeship in the years 2000-2006 decreased as follows: drivers from 800 in the year 2000 to 678 in 2006 (by 15.3%), passengers from 714 to 604 (by 15.4%), pedestrians from 586 to 354 (by 39.6%). Within the study period, the percentage share of drivers (in %) among all road casualties increased from 38.1% in the year 2000 to 41.4% in 2006. However, at the same time the involvement of pedestrians decreased considerably from 27.9% to 21.6% whereas that of passengers remained stable (Table 2).

TABLE 2. Percentage share of drivers, pedestrians and passengers in the total number of road casualties in Podlaskie Voivodeship in the years 2000-2006.

Year	Driver	Passenger	Pedestrian
2000	38.1	34.0	27.9
2001	38.0	38.6	28.6
2002	39.3	35.3	25.4
2003	40.1	35.8	24.1
2004	40.9	35.2	23.9
2005	40.7	36.3	22.9
2006	41.4	36.9	21.6

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

The number of drivers and passengers affected in road accidents in Podlaskie Voivodeship in the years 2000-2006 as calculated per one accident increased by 0.08 (from 0.52 to 0.60) and by 0.06 (from 0.47 to 0.53), respectively. Within the same time, the number of the affected pedestrians per accident decreased by 0.07 (from 0.38 to 0.31).

The total number of road fatalities in Podlaskie Voivodeship in the years 2000-2006 remained stable (approximately 200 annually), although the involvement of the killed among road casualties increased from 9.57% in the year 2000 to 12.71% in 2006. The total number of the injured in road accidents in the study period decreased from 1,899 in the year 2000 to 1,428 in 2006 (by 24.8%). The percentage share of the injured among road casualties was reduced from 90.43% in the year 2000 to 87.29% in 2006. The fatalities in the whole period accounted for 10.86% of all casualties, whereas the injured for 89.14% (Table 3).

The total number of the killed at the site of the accident within the study period was 1,093, ranging from 136 to 171 annually and showing an increasing tendency. Those killed on the spot accounted for 76.7% of all fatalities and 8.33% of all casualties. The total number of deaths up to 30 days after the accident ranged from 35 to 58 annually and remained stable. Those who died within a 30-day period accounted for 23.3% of all fatalities and 2.5% of all casualties (Table 4).

The total number of the severely injured in the years 2000-2003 remained at the level of 500 annually and since the year 2004 it decreased to about 350. The severely injured in the study period accounted for 28.9% of all the injured and 25.7% of all road casualties. The total number of slightly injured casualties decreased in the years 2000-2006 from 1,337 in the year 2000 to 1,108 in 2006 (by 17.1%). In the study period, those slightly injured accounted for 71.1% of all the injured and 63.4% of all road casualties (Table 5).

TABLE 3. Total number of road casualties in Podlaskie Voivodeship in the years 2000-2006.

Year	No of fatalities	% contribution of fatalities to the total number of casualties	No of the injured	% contribution of the injured to the total number of casualties
2000	201	9.57	1899	90.43
2001	183	9.63	1718	90.37
2002	209	10.04	1873	89.96
2003	214	11.00	1731	89.00
2004	199	11.29	1564	88.71
2005	211	12.44	1485	87.56
2006	208	12.71	1428	87.29
Total	1425	10.86	11698	89.14

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

TABLE 4. The total number of road fatalities (on the spot and up to 30 days) in Podlaskie Voivodeship in the years 2000-2006.

Year	No of casualties killed on the spot	No of casualties who died up to 30 days
2000	147	54
2001	136	47
2002	155	54
2003	156	58
2004	164	35
2005	171	40
2006	164	44
Total	1093	332

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

TABLE 5. The total number of the injured (slightly and severely) in road accidents in Podlaskie Voivodeship in the years 2000-2006.

Year	No of the slightly injured	No of the severely injured
2000	1337	562
2001	1159	559
2002	1227	646
2003	1215	516
2004	1185	379
2005	1108	377
2006	1088	340
Total	8319	3379

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

The risk of fatal accidents in Podlaskie Voivodeship increased considerably in the year 2002. The death rate rose from 15.13/100,000 inhabitants in the year 2001 to 17.31/100,000 inhabitants in the year 2002, from that time approximating the level of 17. The mean number of the dead per 100,000 inhabitants in the years 2000-2006 in Podlaskie Voivodeship was 16.9. The rate value for Poland within the study period showed a falling tendency (14.85 killed/100,000 inhabitants) (Figure 2).

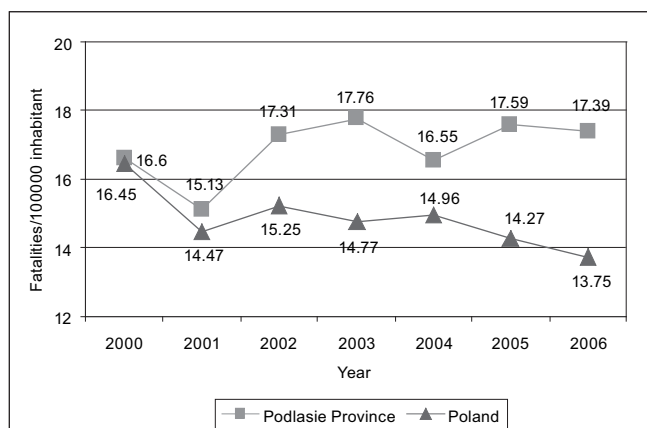


FIGURE 2. The number of road deaths per 100,000 inhabitants – the risk rate.

Source: The authors’ own analysis based on data provided by the Voivodeship Police Headquarters in Białystok and General Statistical Office of Poland (GUS) [5-11].

The severity of road accidents was intensified in the study period – the rate increased from 13.1 deaths /100 accidents in the year 2000 to 18.3 deaths /100 accidents in 2006. The mean number of fatalities/100 accidents in the years 2000-2006 in Podlaskie Voivodeship was 15.4, the rate for Poland being 11-12 deaths/100 accidents (Figure 3).

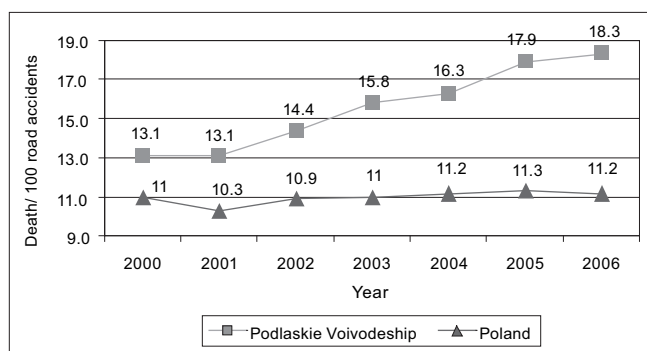


FIGURE 3. The number of deaths/100 road accidents – severity rates. Source: The authors’ own analysis based on data provided by the Voivodeship Police Headquarters in Białystok and GUS [13-19].

Among the injured casualties in Podlaskie Voivodeship in the years 2000-2006 men constituted the predominant group, accounting for 60%. Among those killed, the share of men was very high: 74.7% (to 30 days) and 82.2% (on the spot) (Table 8).

TABLE 8. Road casualty distribution by gender in Podlaskie Voivodeship in the years 2000-2006.

Type of injury	Women (%)	Men (%)
Killed on the spot	17.8	82.2
Dead up to 30 days	25.3	74.7
Severely injured	35.9	64.1
Lightly injured	37.5	62.5
Total	35.1	64.9

The authors’ own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

The percentage road casualty distribution by gender in the respective years is presented in Figure 4. The percentage share of both genders in road accidents in Podlaskie Voivodeship is stable, with women accounting for approximately 1/3 of road casualties.

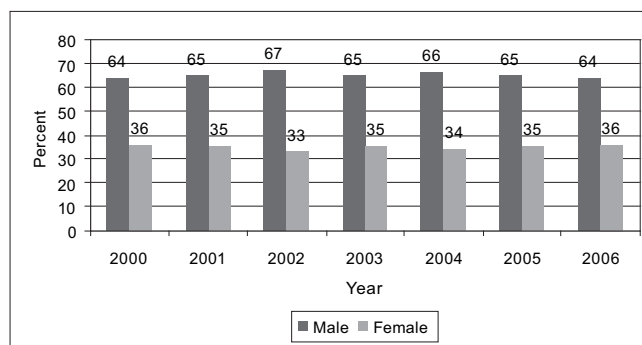


FIGURE 4. Percentage road casualty distribution by gender in Podlaskie Voivodeship in the years 2000–2006.

Source: The authors’ own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

Road casualty distribution by age in Podlaskie Voivodeship in the years 2000-2006 is presented in Figure 5. The age group distribution is very similar in particular years with the dominant of the 20-29 years age group. High involvement rate in road accidents was also noted for subjects aged 10-19 years (18.8%), 30-39 years (16.6%) and 40-49 years (14.0%). The lowest involvement rate was observed for the elderly (over 80 years old), accounting for 1.7% of the total number of casualties.

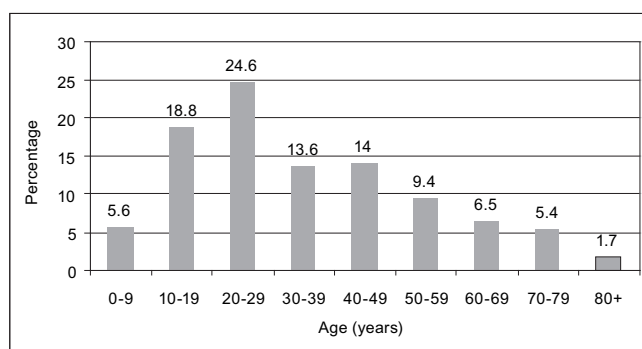


FIGURE 5. Percentage road casualty distribution by age in Podlaskie Voivodeship in the years 2000-2006.

Source: The authors’ own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

Among road casualties, those aged 20-29 had the greatest share both in the group of the injured and killed. In this age group, 287 fatalities were recorded, accounting for 8.9% of all casualties in this group. In the age group of 0-9 years, 28 children were killed, accounting for 3.8% of all casualties in this group. In the 80+ age group, 52 people were killed, i.e. 20.8% of all casualties in this group.

The age distribution of the injured is similar to that of all road casualties (Figure 5), whereas age distribution of the killed is characterized by two maxima: within the range of 20-29 and 40-49 years (Figure 6).

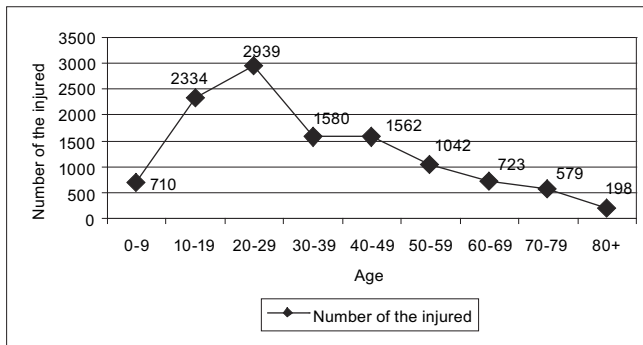


FIGURE 6. Distribution of the injured in road accidents by age in Podlaskie Voivodeship in the years 2000-2006.

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

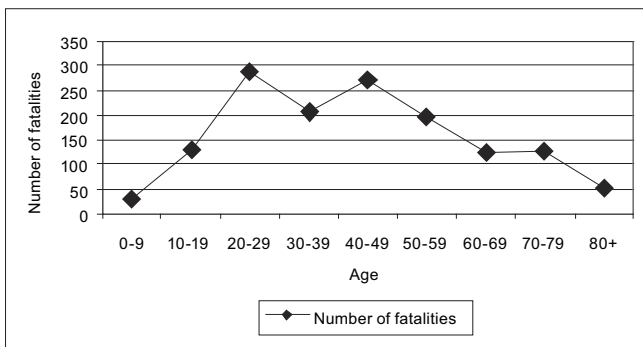


FIGURE 7. Distribution of road fatalities by age in Podlaskie Voivodeship in the years 2000-2006.

Source: The authors' own analysis based on data provided by the Voivodeship Police Headquarters in Białystok.

DISCUSSION

The first part of the paper presents the number and structure of road casualties in Podlaskie Voivodeship in the years 2000-2006. Data collected by the police refer only to physical health condition of victims and not to psychological consequences of road accidents (most frequently post-accident shock) [12].

The analysis indicates that road traffic safety in Podlaskie Voivodeship compares unfavorably against other Polish voivodeships. The analyzed rates (number of deaths per 100 road accidents and per 100,000 inhabitants) were higher than the Polish average. The number of road fatalities/100,000 inhabitants in the years 2000-2006 in Podlaskie Voivodeship was higher by 14% and per 100 road accidents by 40% as compared to the value reported for the whole country.

The number of road fatalities in Poland in the study period fell from 6,294 in the year 2000 to 5,243 in 2006 (by 16.7%) [13-19], whereas in Podlaskie Voivodeship, it remained stable (approximately 200 annually). High involvement of road fatalities on the spot can be observed (76.7% in the years 2000-2006), which additionally shows a growing tendency. The incidence rate of the injured/100 accidents in Podlaskie Voivodeship in 2006 was 125.6, being similar to the Polish average (126.1) [2].

The involvement of pedestrians in road accidents in Podlaskie Voivodeship was comparable to the data for Poland. In 2006, men accounted for 61.6% of the injured in Pod-

laskie Voivodeship and 60.3% in Poland, whereas women for 38.4% and 39.7%, respectively. In the same year, men accounted for 76.4% of the killed in Podlaskie Voivodeship and 76.5% in Poland, whereas women – 23.6% and 23.5%, respectively [20].

In reports on the age structure of road casualties issued by the Main Police Headquarters, other age intervals are used [20]. A comparison of our own data with those of the Main Police Headquarters [20] reveals that road casualty age distribution in Podlaskie Voivodeship in the year 2006 was comparable with that in Poland.

Statistically, Poland occupies a leading place in the world in the severity of road accidents and the related risk of death [1]. The rates are published each year by the Institute of Car Transportation [21-24].

The rates of road fatalities per 100000 inhabitants in the years 2003-2006 were the lowest in Holland, Great Britain, Sweden and Norway (4-6 deaths/100000 inhabitants) and in Austria, Germany, Denmark (6-9 deaths/100000 inhabitants). Poland has one of the highest risks of fatal accidents among the analyzed countries (13-15). Similar situation was observed in South Korea (13-15), Hungary (13) and Czech Republic (10-14) [21-24].

The accident severity rate (number of the killed/ 100 road accidents) in the years 2003-2006 showed the lowest values in Japan and Canada (1 death/100 accidents) as well as in Austria, Belgium, Germany, Switzerland and Great Britain (2 deaths/100 accidents). Poland has the highest severity rate of all the analyzed countries [21-24]. In this context, the fact that the accident severity rate in Podlaskie Voivodeship is still by 40% higher than in Poland only emphasizes the dramatic situation.

At the same time, Poland has the lowest motorization rate (number of cars/1000 inhabitants) of all the analyzed countries. In the year 2006, it was 351 (as compared to 559 in Germany, 505 in Austria, 489 in France). This indicates that although Polish people have fewer cars, they are more at risk of death due to road accidents than citizens of the other countries studied [22].

The road traffic victims in Poland are usually killed outside built-up areas (in 2006 – 71.53% accidents) [23]. For a few years now, high mortality has been observed in non-built-up areas, due to overspeeding, more people being killed in one accident and hindered access to medical care [20].

One of the strategic objectives of the National Health Program for the years 2007-2015 is to reduce the incidence of injuries due to accidents and their consequences [24]. The number of road fatalities (reduction in the percentage of road fatalities) is, apart from deaths at work, an ultimate index of health-related effects. The expected change in the index as compared to the baseline year 2005 is a drop in the number of road fatalities from 5600 to 2600 in the year 2015 (by 54%). Taking into account the number of road fatalities in the years 2000-2006, this can be very difficult to achieve in Podlaskie Voivodeship, where the contribution of road fatalities to the total number of road casualties shows an increasing tendency. Multifunctional actions covering health promotion, prevention, organization and financial contribution of various institutions will be necessary to reduce the number of road fatalities compared to other provinces and especially to EU countries [25]. The effectiveness of the

actions taken should be evaluated in order to verify and supplement the plans for subsequent years, with special attention paid to cyclic and long-term measures. A reduction in the number of road fatalities in Podlaskie Voivodeship to the level assumed by the National Health Program should become the priority.

CONCLUSIONS

1. In the years 2000-2006 in Podlaskie Voivodeship:
 - a. the number of road accidents decreased by 25.7%, and the number of road casualties by 22.1%,
 - b. the number of road fatalities remained stable (with a certain increase in the number of deaths on the spot), whereas the number of the injured decreased considerably,
 - c. the mean number of casualties as calculated per one accident was by 5% higher than the Polish average,
 - d. the rate of road fatalities/100,000 inhabitants remained at the higher level than the Polish average,
 - e. the rate of road accident severity measured by the number of fatalities/100 accidents was considerably higher than the Polish average (by 40%),
 - f. in age groups of road casualties, young people (20-29 years old) had the greatest contribution, and also the increased number of the 40-49 years old was observed among road fatalities,
 - g. men predominated among the injured casualties – over 60%; the percentage of men killed was very high – 74.7% (death within 30 days) and 82.1% (death on the spot),
 - h. among road casualties, the percentage share of drivers increased, of pedestrians – decreased and of passengers was stable.
2. Road accidents remain a serious threat to health in Poland, particularly in Podlaskie Voivodeship.

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Informacje o Autorach

Mgr MARZENA PAWIŃSKA – asystent, dr n. med. JACEK A. PIĄTKIEWICZ – adiunkt, mgr MAGDALENA ZALEWSKA – asystent, lek. med. JACEK JAMIÓŁKOWSKI – asystent, dr hab. n. med. ANDRZEJ SZPAK – kierownik, Zakład Zdrowia Publicznego Uniwersytetu Medycznego w Białymstoku, mgr BOGUMIŁ MATWIEJUK – komisarz, mgr ADAM CZERWIŃSKI – Komenda Wojewódzka Policji w Białymstoku.

Adres do korespondencji

Mgr Marzena Pawińska
Zakład Zdrowia Publicznego
Uniwersytet Medyczny w Białymstoku
ul. I Armii Wojska Polskiego 2/2
15-103 Białystok