



ROAD INJURIES AMONG POPULATION OF THE REPUBLIC OF MOLDOVA - DATA, TRENDS AND PREVENTIVE MEASURES

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Introduction. The latest WHO report on the prevention of road injuries emphasizes the need to improve road safety management, especially in developing countries, the analysis of traffic accidents, as well as the application of good practices adapted to local conditions. The Republic of Moldova has a fragmented road injury reporting system, so the purpose of this study was to study the trends and general aspects of road injuries in the country's population.

Material and methods. A cross-sectional, descriptive research was carried out during 2007-2020, which studied the main indicators of morbidity and mortality rates due to injuries and road injuries among the adult population of the Republic of Moldova, based on the official statistical data of the National Agency for Public Health and the National Bureau of Statistics from the Republic of Moldova

Results. The study's findings revealed that in terms of the general prevalence of the population, traumatic injuries, poisoning, and other consequences of external sources rank 8th across the republic and 6th in Chisinau. The mortality indicators of the population according to the main causes of death, rank injuries and poisonings are on the 4th place, and injuries caused by road accidents on the 2nd place both in the republic and in the capital city. There is a slight downward trend in the mortality indicators of the population due to traffic accidents.

Conclusions. The obtained data pointed out the importance of road behavior improvement among the entire society, whereas the specialists from various fields should be permanently involved in activities of raising awareness among all road traffic participants.

Cuvinte cheie: accident, traumă rutieră, măsuri de prevenție, populația adultă, registru.

TRAUMATISMELE RUTIERE ÎN RÂNDUL POPULAȚIEI DIN REPUBLICA MOLDOVA: DATE, TENDINȚE ȘI MĂSURI DE PREVENIRE

Introducere. Ultimul raport al OMS, vizând prevenirea traumelor rutiere, subliniază necesitatea îmbunătățirii managementului siguranței rutiere, în special în țările în curs de dezvoltare, a analizei accidentelor în trafic și a aplicării bunelor practici adaptate la condițiile locale. Republica Moldova are un sistem fragmentat de raportare a traumelor rutiere, astfel că scopul acestui studiu a fost studierea tendințelor și a aspectelor generale ale traumelor rutiere în rândul populației țării.

Material și metode. A fost realizat un studiul transversal, descriptiv, în baza datelor statistice oficiale ale Agenției Naționale pentru Sănătate Publică și ale Biroului Național de Statistică din Republica Moldova, pentru perioada 2007-2020, cercetându-se principalii indicatori ai morbidității și ai mortalității prin traume, în general și traume rutiere, în special, în rândul populației adulte din Republica Moldova.

Rezultate. Rezultatele cercetării au evidențiat că leziunile traumatice, intoxicările și alte consecințe ale cauzelor externe se clasează pe locul VIII în Republică și pe locul IV în mun. Chișinău, conform prevalenței generale în rândul populației. Indicatorii mortalității populației, după principalele cauze de deces, situează traumele și intoxicările pe locul IV, iar traumele cauzate de accidente rutiere ocupă locul II atât în republică, cât și în municipiu. Se atestă o ușoară tendință de micșorare a indicatorilor mortalității populației prin accidente de circulație.

Concluzii. Datele obținute relevă necesitatea ameliorării comportamentului rutier al întregii societăți și a implicării continue a specialiștilor din diverse ramuri în activități de sensibilizare a tuturor participanților în trafic.

INTRODUCTION

Over the past decade, various interventions have been implemented worldwide to reduce the most serious road traffic crashes, however, road traffic injuries remain an important public health issue and one of the leading causes of death due to the injury severity, especially among young people of working age. In the Republic of Moldova, road traffic injuries rank as the 8th leading cause of death and, according to the latest prognoses, are at risk of taking the 5th place by 2030 (1 - 5). Road traffic accidents are the leading cause of hospital admissions among adolescents aged 18–24 years, accounting for 23% of road traffic deaths, thus, young people make up about a quarter of all road traffic deaths (6). According to the World Health Organization report on road safety, it has been mentioned that the road safety issue is getting worse every year, causing huge financial losses in medical treatment, healthcare and all types of human suffering (4, 7, 8).

According to the UN Sustainable Development Goals 3.6 of the 2030 Agenda, a recent resolution adopted by the UN General Assembly in 2020 sets out the ambitious goal of preventing at least 50% of deaths and injuries caused by road traffic accidents by 2030 (9). The Global Plan correlates with the Stockholm Declaration, which emphasizes the importance of a holistic approach to road safety and calls for continuous improvement in road and vehicle design; improvement of laws and their enforcement; providing timely and life-saving emergency care to the injured. The progress achieved over the last decade on 2011-2020 road safety action has laid the foundation for an accelerated tendency in the coming years. Achievements include placing road safety on the global health and development agenda, widely disseminating the scientific trends on good practices, strengthening partnerships and networks, as well as mobilizing adequate resources.

This new Decade of Action provides an opportunity to benefit from the successes and failures over the past years, as well as build up strategies to save more lives. According to the goals set by the EU and at the UN level, the Republic of Moldova declared that it supports the sustainable development goals and will reflect the issue of road safety in its national policy. In this context, it is noteworthy that road traffic injuries are predictable and preventable. Globally, numerous policies

and intervention projects have contributed to significant decrease in road traffic accidents all over many high- and middle-income countries. However, this requires interdisciplinary and intersectoral collaboration. All the countries should comply with the multidisciplinary approach to both injury prevention and road traffic injury prevention, which will directly facilitate achieving of the objectives proposed in official documents (10). *The purpose of this study* was to study and evaluate the rates of morbidity and mortality from injuries in general and road traffic accidents over the past 14 years, as well as to identify the preventive measures to be used within the Republic of Moldova.

MATERIAL AND METHODS

A descriptive retrospective study was conducted over a 14-year period (2007-2020) to study the main indicators of morbidity and mortality due to road traffic injuries among the adult population of the Republic of Moldova. The analysis was carried out on the basis of official statistics provided by the Health Data Management Department of the National Public Health Agency and the National Bureau of Statistics of the Republic of Moldova. Mixed research methods were used to process and describe the collected data, such as descriptive analysis, epidemiological and statistical methods, and comparative analysis according to different evaluation criteria. The data were interpreted using Excel and IBM SPSS Statistics 20.

RESULTS

The digital health data registry compiled all the statistical yearbooks of the health system of the National Public Health Agency, which include all types of injuries categorized as traumatic injuries, poisoning and other external consequences. According to the analysis, traumatic injuries, poisoning and other external consequences are ranked the 8th (332.2 cases per 10 thousand population) among the overall morbidity of the population of the republic and 4th in Chisinau (836.3 cases per 10 thousand population) during 2007-2020. Among adults, for the same period, these rank the 6th in Chisinau (669.4 cases per 10 thousand population) and the 8th across the Republic (295.7 cases per 10 thousand population), as shown in Figure 1.

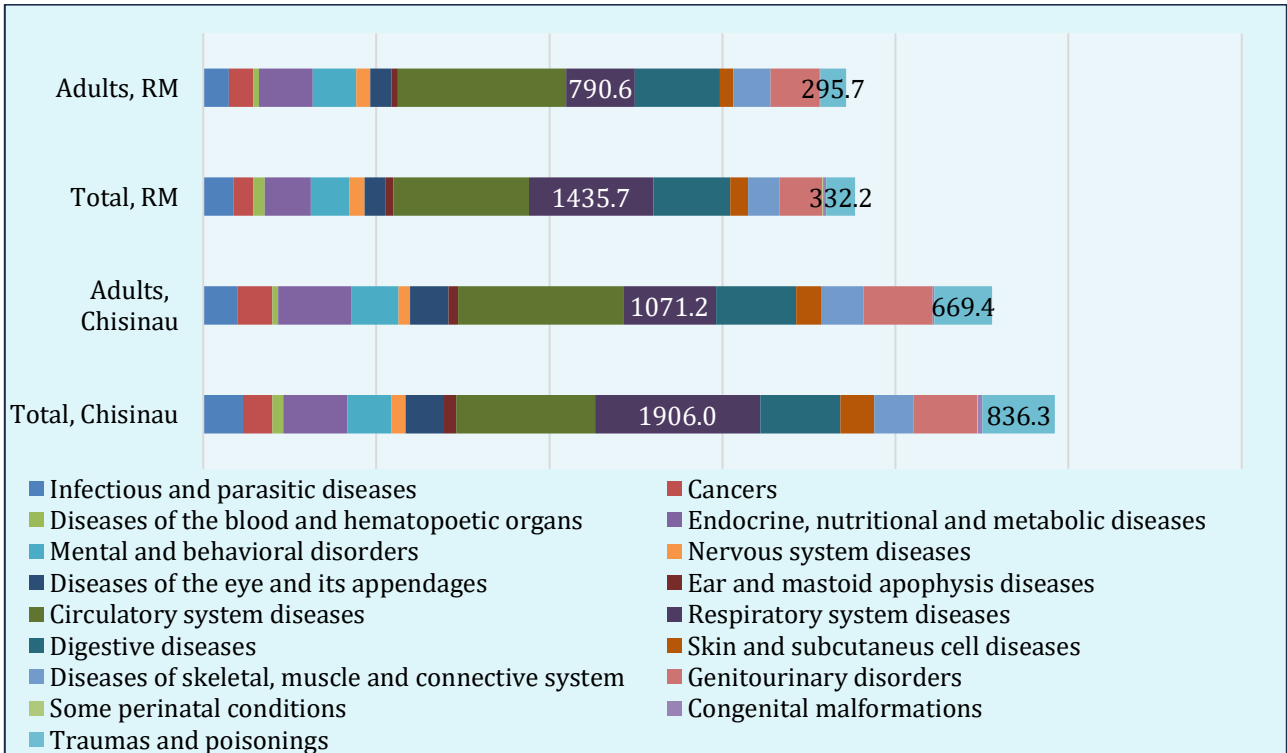


Figure 1. General morbidity per 10 thousand people, the mean for 2007-2020 per total number of adult population in both Chisinau and the Republic of Moldova.

According to the incidence dynamics of injuries, poisonings and other consequences of external causes, a sharp decrease in the number of cases per 10 thousand population was registered in Chisinau and across the Republic of Moldova in the period 2007-2020 (fig. 2). Thus, there is a 3.3-fold decrease (from 929.4 cases per 10 thousand inhabitants in 2007 to 277.6 cases per 10 thousand inhabitants in 2020) of the general population in Chisinau and a 4.2-fold decrease among

the adult population (from 789.6 cases per 10 thousand population up to 188 cases per 10 thousand inhabitants). In the Republic of Moldova, there is a total of 2.4-fold decrease in the population (from 385.5 cases per 10 thousand inhabitants in 2007 to 160.7 cases per 10 thousand inhabitants in 2020) and 2.6 times among adults (from 361.4 cases per 10 thousand inhabitants up to 134.3 cases per 10 thousand inhabitants).

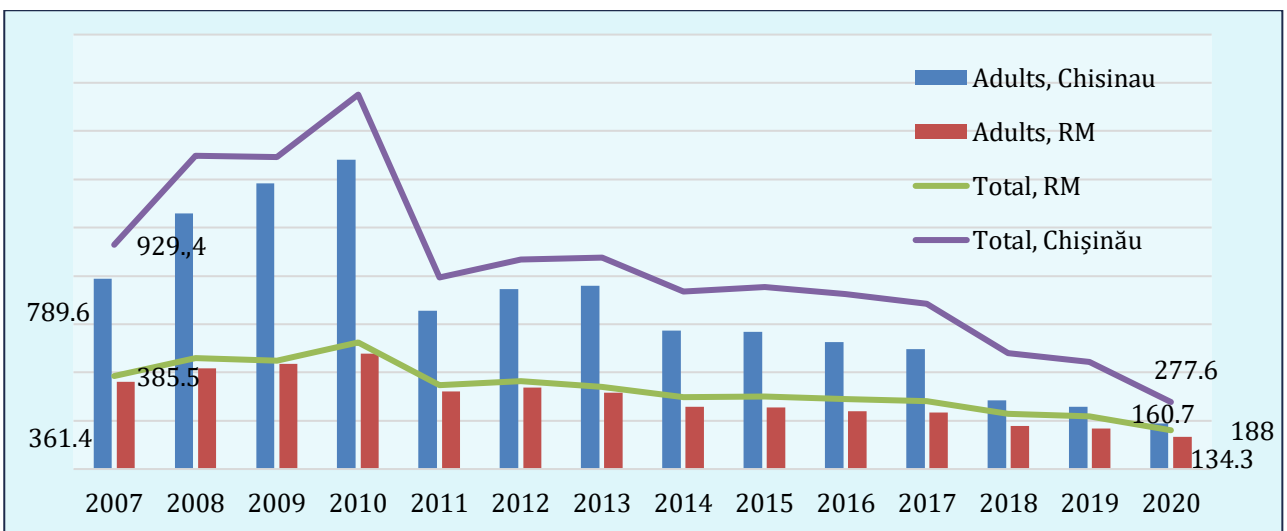


Figure 2. Prevalence of injuries, poisonings and other consequences of external causes in Chisinau and the Republic of Moldova during 2007-2020, per 10 thousand people.

The incidence rates of traumatic injuries, poisonings and other consequences of external causes in both Chisinau and the Republic of Moldova for the same period (fig. 3) also show a similar significantly decreasing tendency in both the republic and among adults.

The injury incidence rates also indicate (fig. 4)

a downward trend in the number of cases over the study period. Data for the last 14 years (2007-2020) in Chisinau show a 3.3-fold decrease in the general population (from 9022.2 per 100,000 population to 2689.3 cases, respectively) and a 4.2-fold decrease among the adult population (from 7605.4 cases per 100 thousand population up to 1797.6 cases).

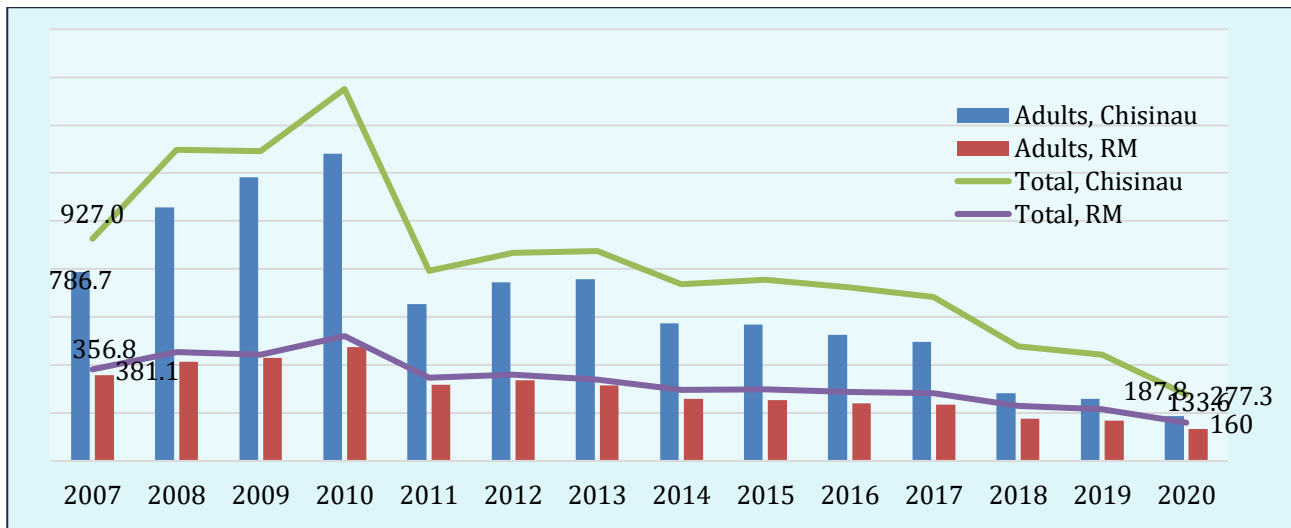


Figure 3. Incidence of injuries, poisonings and other consequences of external causes, in both Chisinau and the Republic of Moldova, the mean for 2007-2020 per 10,000 inhabitants.

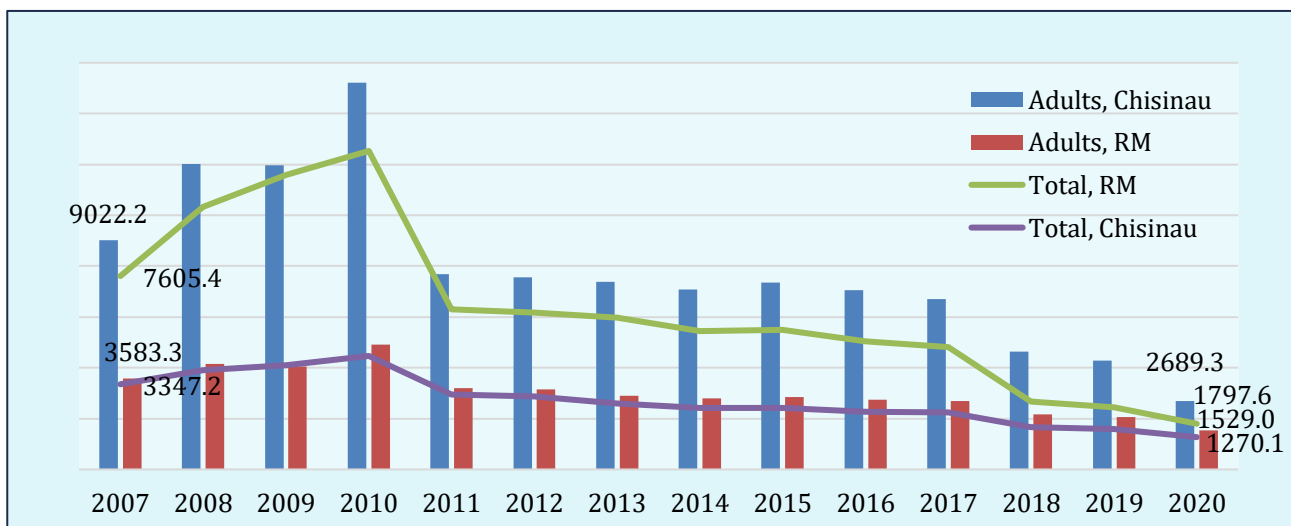


Figure 4. Injury incidence in Chisinau and RM during, the mean for 2007-2020 per 100 thousand inhabitants.

In terms of mortality indicators for the main causes of death, the mean value for 2007-2020 (fig. 5) on injuries and poisonings is ranked 4th (with 81.3 cases per 100 thousand population in the Republic of Moldova and 54.5 cases per 100 thousand population in Chisinau).

According to population mortality indices and depending on the types of injuries and poisonings (fig. 6), injuries caused by road traffic accidents rank 2nd both across the republic (11.6 cases per 100 thousand population) and in the capital city (8.3 cases in Chisinau).

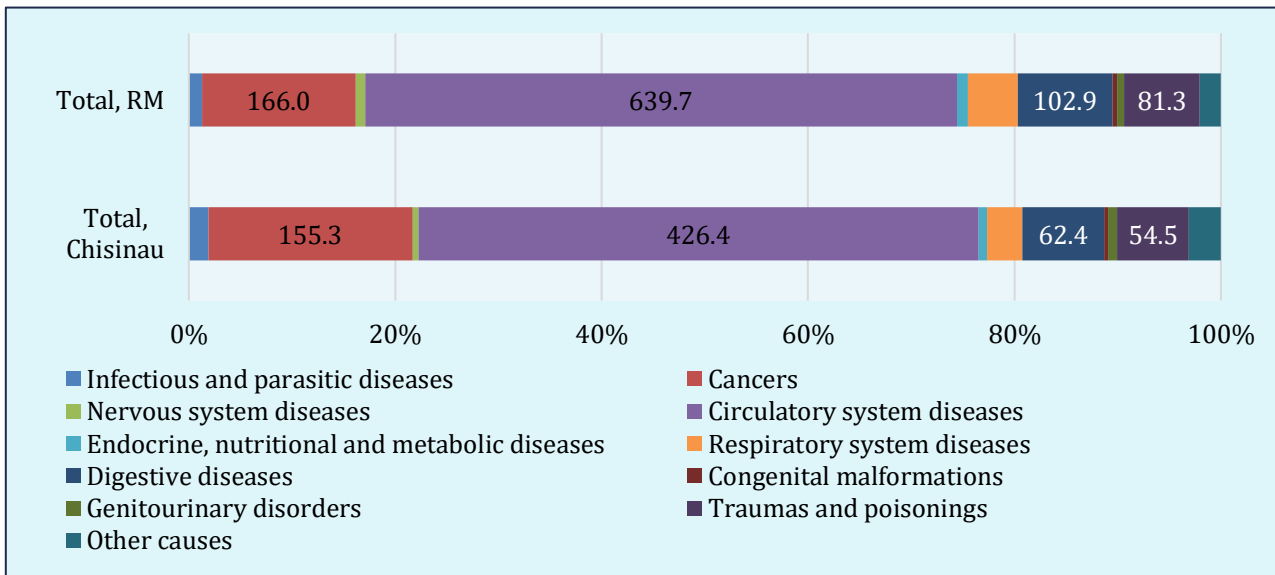


Figure 5. Mortality rate by main causes of death per 100,000 inhabitants in both Chisinau and the Republic, the mean value for 2007-2020.

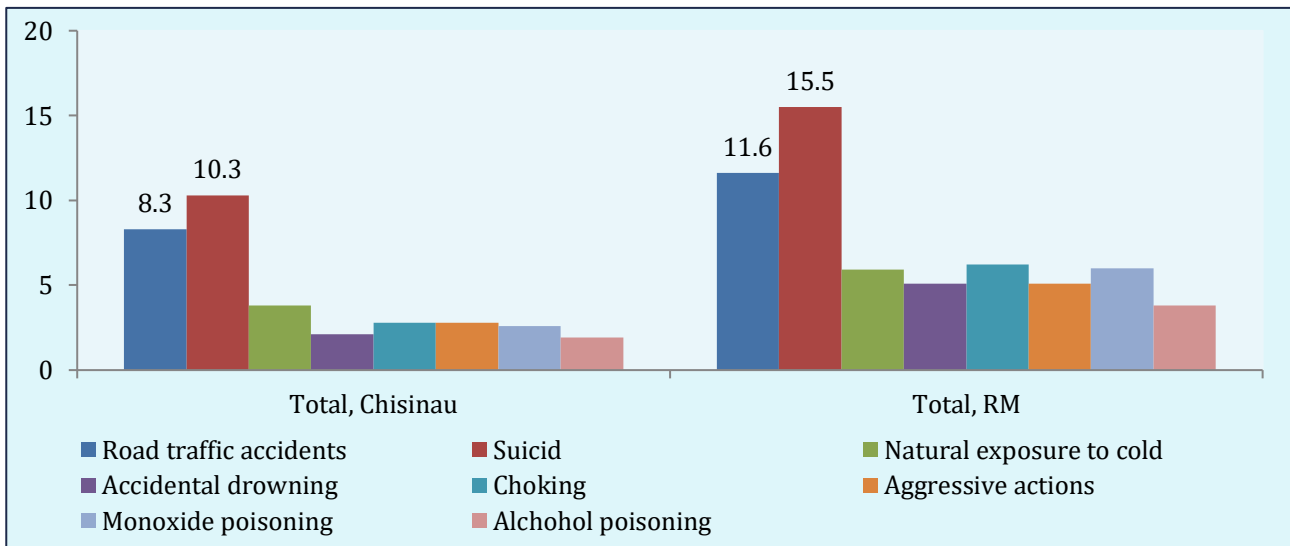


Figure 6. Mortality rates by types of injuries and poisonings both in Chisinau and in the Republic of Moldova, the mean for 2007-2020 per 100,000 inhabitants.

As regarding the mortality rates (fig. 7) due to road traffic accidents, there is an obvious downward trend for both Chisinau and the Republic of Moldova during the period of 2007-2020, viz. from 16.5 cases per 100 thousand inhabitants to 8.2 cases in the Republic of Moldova (a 2-fold decrease) and from 14.5 cases to 5.7 cases in the capital city (a 2.5-fold decrease), respectively.

DISCUSSIONS

This research highlights the goal and the importance of studying general injuries, as well as those

resulting due to road traffic accidents. These are due to common factors, injuries, poisoning and other consequences of external causes in the general morbidity of the population, ranking 8th in the republic and 6th in Chisinau. At the same time, injuries due to road traffic accidents are the main causes of death and rank second both in the republic and in the capital city. However, there is a tendency to reduce the mortality rates of the population as a result of road traffic accidents during the period under study. The specialized literature points out that the most common casualties of road

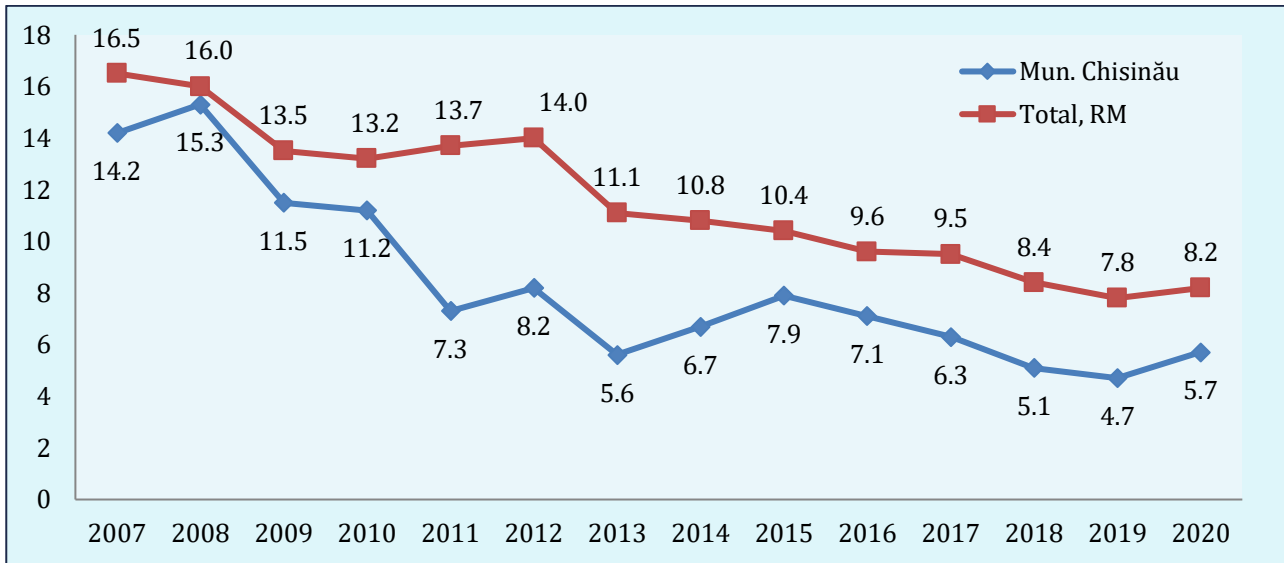


Figure 7. Mortality due to traffic accidents in both Chisinau and the Republic of Moldova for 2007-2020 years per 100 thousand inhabitants.

traffic injuries leading to death are middle-aged people, most of them being males under the influence of alcohol (3, 5, 8). A recent study (11) found a slight downward trend in the total number of fatal accidents and the number of people injured in road traffic accidents. It should be noted that the Republic of Moldova is characterized by high mortality rates due to traffic accidents, the most vulnerable group being men aged 20-29 and 50-59 years. Children and people over 50 years are more likely to become involved in road traffic crashes, whereas the age group of 15-39 years showed a higher risk of fatal outcome while driving or being a passenger of a vehicle. The presents study highlights the need for providing effective measures to reduce deaths following road traffic accidents (12, 13).

Previous studies have mentioned the importance of preventing road traffic crashes and reducing the number of road traffic accidents (3, 4, 14). Every year, a number of countries worldwide, as well as our country organize international projects and campaigns to encourage and raise awareness on citizen's responsible behavior by

providing relevant and important information for drivers, motorcyclists, pedestrians or cyclists, which have contributed to a decrease in road traffic accidents and their related injuries. Therefore, our country should focus on reducing accidents and developing good data recording systems. Root-cause investigation and analysis should be carried out in order to find appropriate preventive measures. There is also no standard package of interventions suitable for all countries (14, 15, 16).

Interventions that have proven effective in one country may not be effective in others and need to be adapted to local conditions. There are several best practices that can be followed regardless of a country's income, including the use of health education and health promotion: reducing exposure to risk through transport and land use policies; marking the road network to prevent traffic accidents; improving the road visibility; promoting car designs to protect against accidents; establishing and enforcing compliance with key road safety rules; providing post-accident health assistance.

CONCLUSIONS

1. The dynamics of road traffic accidents over the study period showed a slightly decreasing trend towards the total number of road traffic accidents resulting in casualties and people injured as a result of road traffic accidents.
2. During the study period, the mortality rates for the main causes of death due to injuries and poisonings are ranked the 4th, while injuries caused by road traffic accidents rank 2nd among all types of injuries and poisonings.

- The obtained data indicate the importance of developing several campaigns for the prevention of road traffic injuries, as well as the strengthening of the multidisciplinary efforts of all the participants from various authority bodies and competent structures.

CONFLICT OF INTERESTS

The authors report no conflicts of interest in this work.

ETHICAL APPROVAL

This study was approved by the Ethics Committee of the *Nicolae Testemitanu* State University of Medicine and Pharmacy, decision no. 2 of 03/04/2020.

REFERENCES

- Goniewicz K, Goniewicz M, Pawłowski W, Dorota L. Epidemiology of road traffic accidents in adults. A systematic review. *Journal of Education, Health and Sport*. 2017;7(7):92-100. doi:10.5281/zenodo.823475
- Rus D. Epidemiology of Road Traffic Injuries Treated in a Large Romanian Emergency Department in Tîrgu-Mureş Between 2009 and 2010. *Traffic Injury Prevention Journal*. 2015;16(8). doi:10.1080/15389588.2015.1030501.
- Palanciuc M, Cemîrtan V. The epidemiology of road traumas in Moldova. *Sănătate Publică, Economie și Management în Medicină*. 2015.3 (60):39-41.
- WHO. Global Status Report on Road Safety. 2018. Available from: <https://www.who.int/publications/i/item/9789241565684> [Accessed 26 august 2022].
- Cociu S. Road traffic injuries among adult population in the Chisinau municipality. *Sănătate Publică, Economie și Management în Medicină. Chişinău*. 2019;4(82):147-151.
- Gicquel L, Ordonneau P, Blot E, Toillon C, Ingran P, Romo L. Description of various Factors Contributing to Traffic Accidents in Youth and Measures Proposed to Alleviate Recurrence. *Frontiers in Psychiatry*. 2017;8(94). doi:10.3389/fpsy.2017.00094
- European Commission. Best practices in road safety. Handbook for measures at the European Level. 2010. Available from: https://trimis.ec.europa.eu/sites/default/files/project/documents/supreme_d_handbook_for_measures_at_the_european_level.pdf [Accessed 26 august 2022].
- Ciobanu Gh. Road traffic crashes in the Republic of Moldova and intervention measurements to reduce their effects. *Buletinul Academiei de Ştiinţe a Moldovei*. 2011;2(30):25-33.
- WHO. Decade of Action for Road Safety 2021-2030. Available from: <https://www.who.int/teams/social-determinants-of-health/safety-and-mobility/decade-of-action-for-road-safety-2021-2030> [Accessed 2 October 2022].
- Staton C, Vissoci J, Gong E, Toomey N, Wafula R, Abdelgadir J, et al. Road Traffic Injury Prevention Initiatives: A Systematic Review and Metasummary of Effectiveness in Low and Middle Income Countries. *PLoS One*. 2016;11(1): e0144971. doi:10.1371/journal.pone.0144971
- Cociu S, Apostol P, Cazacu-Stratu A, Cebanu S. Road safety and accidents prevention in the Republic of Moldova. *Revista de Ştiinţe ale Sănătăţii din Moldova*. 2021;1(26):33-42.
- Bargan N. Mortality caused by traffic accidents in the Republic of Moldova. *Analele institutului naţional de cercetări economice*. 2016,VII(1): 99-104.
- Baciu Gh, Bondari G. Road trauma with fatal consequences. *Anale Ştiinţifice. Probleme Medico-Biologice, Farmaceutice, de Sănătate Publică și Management, ediția IV. Chişinău*. 2003;1:199.
- WHO. Road traffic injury prevention: training manual. Available from: https://apps.who.int/iris/bitstream/handle/10665/43271/9241546751_eng.pdf?sequence=1&isAllowed=y [Accessed 26 august 2022].
- WHO. United Nations Road Safety Collaboration. Available from: <https://www.who.int/roadsafety/en/> [Accessed 24 august 2022].
- WHO. Global Road Safety Week. Available from: <https://www.who.int/roadsafety/week/2019/en/> [Accessed 24 august 2022].

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