



## THE EVOLUTION OF DEATHS BY TRAUMA AT THE BEGINNING OF THE 21<sup>st</sup> CENTURY IN ROMANIA – A SCIENTIFIC RESEARCH

Dan Nicolae PĂDURARU <sup>1,2</sup>, Dumitru-Cristinel BADIU <sup>1,3</sup>, Georgiana RADU <sup>1</sup>, Octavian ANDRONIC <sup>1</sup>, Anca PANTEA STOIAN <sup>1</sup>, Alexandra BOLOCAN <sup>1,2</sup>, Valentin Titus GRIGOREAN <sup>1,3</sup> and Daniel ION <sup>1,2</sup>

<sup>1</sup> The University of Medicine and Pharmacy “Carol Davila” Bucharest, Romania

<sup>2</sup> The University Emergency Hospital, <sup>3</sup> Surgery Clinic, Bucharest, Romania

<sup>3</sup> The Emergency Clinical Hospital Bagdasar-Arseni, Surgery Clinic, Bucharest, Romania

Correspondence author: Octavian Andronic, E-mail: andronicoctavian@gmail.com

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The beginning of the 21<sup>st</sup> century has brought us huge changes in global science and technology. For medicine, it came along with changes in how we perceive patients, diseases, diagnoses and management of different pathologies. Of these, some of the best results have been obtained in traumatic pathologies where a lowering rate in trauma-related mortality was observed. It is important to assess and monitor the evolution of trauma patients throughout history in order to identify elements or patterns worth keeping or which should be improved for even more promising results in the future. The present research is a retrospective analysis of all trauma related deaths in Romania from the WHO database. The study was conducted using data provided by the World Health Organization and covered the period 2000–2014. In order to have an overview, we compared data found about Romania with the rest of EU countries. The results were encouraging and showed a significant decrease in the total number of deaths, as well as the number of deaths per 100.000 inhabitants.

Depending on the etiology of trauma, various values of mortality decline were recorded, sometimes with a surprising result of halving the number of deaths in a span of just 10 years. In conclusion, the results of our study are encouraging. They demonstrate that along with the development of medicine at the beginning of the 21st century came a better support management of trauma patients, leading to the survival of patients that would have had almost no chance during the past centuries.

*Keywords:* trauma, mortality, death.

### INTRODUCTION

The injury or damage to an organism caused by physical harm from an external source is generally known as trauma. The World Health Organization started a very important initiative of stocking and organizing the number of deaths by trauma-related pathologies more than 30 years ago. This has helped us keep track of the global rate at which things have been changing in this domain. Fortunately, everything is going on an ascendant slope, with fewer deaths every year and small variations from region to region. It is important to assess and monitor the evolution of this group of patients in order to identify the elements on which we must insist to get even more promising results in the

future. As for Romania, things have also improved dramatically in what concerns the number of deaths from trauma-related injuries.

We now have more and more young and motivated physicians, along with the development of ambulance services and emergency medicine on one hand and the technology that allowed a better support management of these patients on the other hand, thus leading to saving lives that would have had almost no chance of survival during the past century.

### MATERIALS AND METHODS

The present study is a retrospective analysis of the total number of deaths and the incidence of trauma-related deaths in Romania, reported to other

countries from Europe. The period over which this research was concentrated ranges from the 1<sup>st</sup> of January 2000 to the 31<sup>st</sup> of December 2014.

Data provided by the European Detailed Mortality Database from the World Health Organization Regional Office for Europe was analyzed, along with available literature found on the subject<sup>1,2,3,4,5</sup>. The statistical interpretation of the data was done using Microsoft Excel and Medcalc applications.

## RESULTS

In 2014, the smallest incidence of deadly trauma was recorded in Spain with a value of 22.09 per 100,000, followed by Bosnia, Germany and Portugal. Romania was in the group of countries with an incidence between 30 and 45 cases per 100,000 inhabitants with a value of 40.41. The highest values of this parameter were registered in Lithuania and Belarus with values of 100,02 and 92,53 deaths respectively per 100,000 inhabitants (Figures 1 and 7).

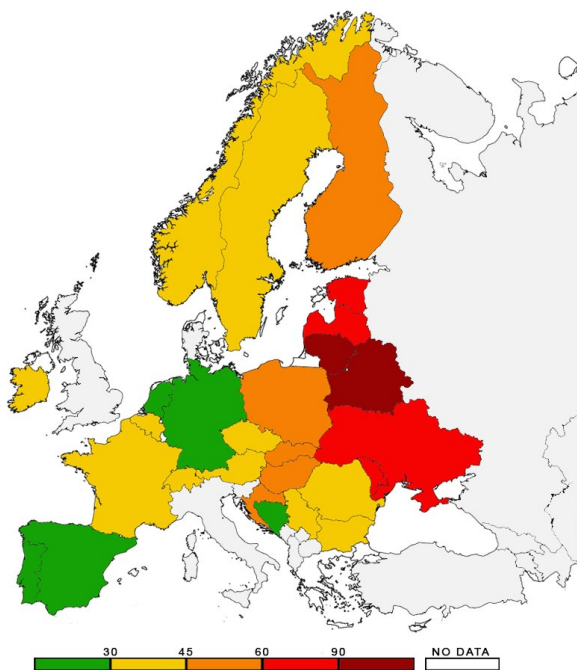


Figure 1. Map of the incidence of trauma-related deaths in Europe in 2014.

Concerning the variation in the incidence of death-causing trauma in Europe, a variance calculated as the ratio between the value in 2014

and the value in 2000, the minimum values could be calculated for eastern European countries with a minimum in Estonia of 0.48, which means that the number of deaths caused by trauma has halved during this period. Romania, with a value of 0.63, was placed in the group of countries with values between 0.6 and 0.7 along with countries like France, Spain and Finland (Figure 2).

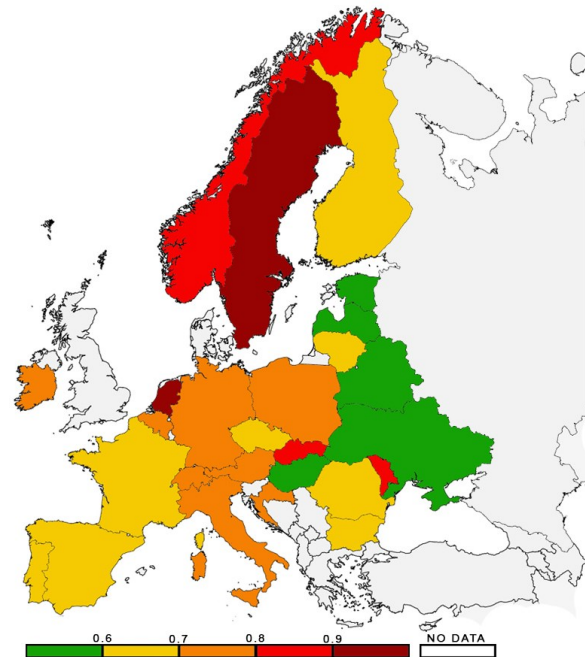


Figure 2. Map of variations in incidence of trauma-related deaths in Europe between 2000 and 2014.

In Romania, most trauma-related deaths are due to transport accidents, with a value of 15.87 deaths per 100,000 inhabitants in 2000, which fell to 9.72 in 2014. The following causes of death through traumatic pathology in Romania are suicides and motorized road traffic accidents, with incidences of 8.87 and 8.16 cases respectively per 100,000 inhabitants in 2014 (Figure 3).

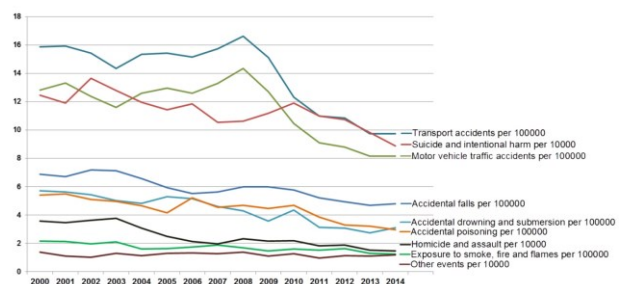


Figure 3. Variation in the incidence of trauma types between 2000 and 2014 in Romania.

The total number of deaths due to trauma in Romania dropped from 10418 in 2000 to 7168 in 2014. The ratio of the number of men to the number of women was kept approximately constant, with small variations (around value of 3) during the study period (Figure 4).

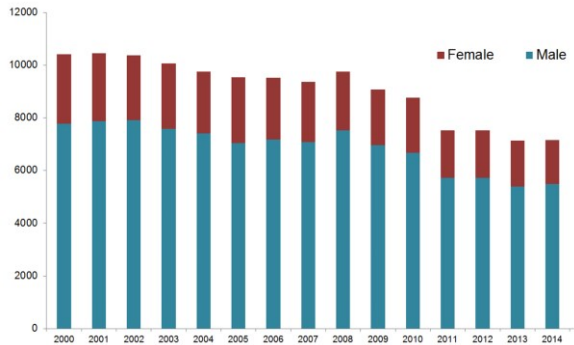


Figure 4. The number of deaths from trauma in the period 2000–2014 and the male / female ratio.

Concerning the variation of the age of birth, there is a difference between the values in Romania (Figures 5 and 8) and the average values of the countries in Europe (Figures 6 and 9). The share of the deaths in the 0–14 age group in Romania and the average of Europe was about 3.5 throughout the study period and in the age group 74+ it was approximately constant at 0.5.

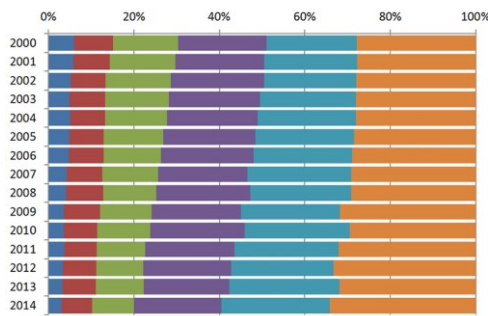


Figure 5. Percentage distribution of deaths due to age-related trauma and its dynamics in 2000–2014 in Romania.

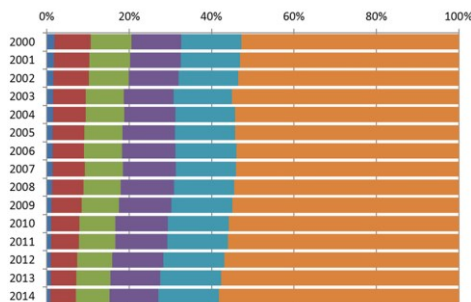


Figure 6. Percentage distribution of deaths due to age-related trauma and its dynamics in Europe 2000–2014.

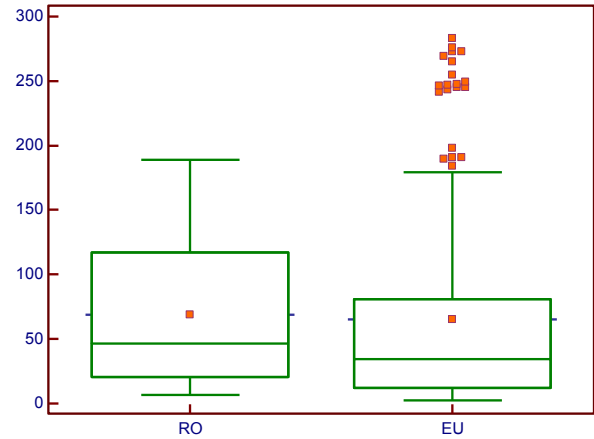


Figure 7. Comparative statistical data on the incidence of deaths (per 100,000 inhabitants) caused by trauma in Romania and Europe.

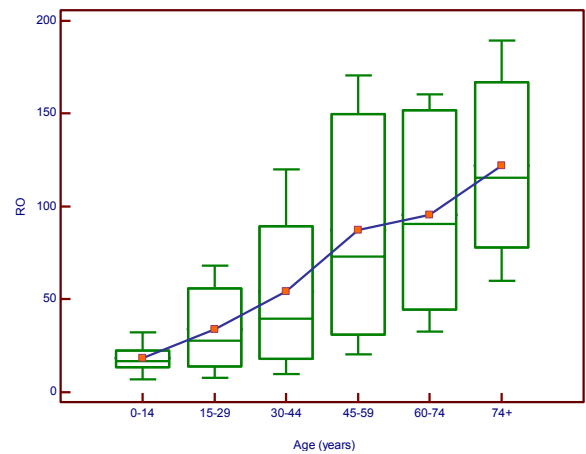


Figure 8. Comparative statistical data by age group on the incidence of deaths (per 100,000 inhabitants) caused by trauma in Romania.

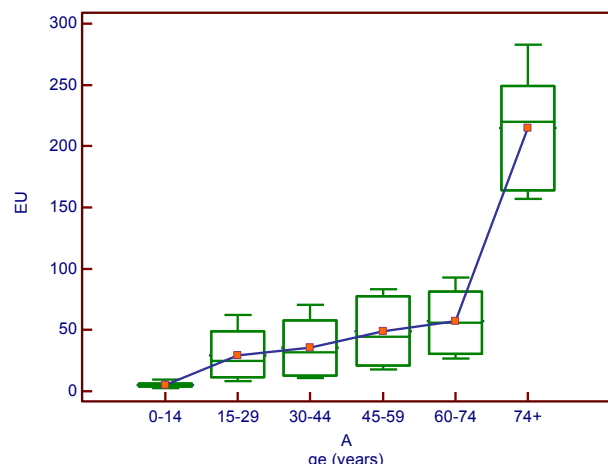


Figure 9. Comparative statistical data by age group on the incidence of deaths (per 100,000 inhabitants) caused by trauma in Europe.

From the point of view of the average values, between 2000–2014, Romania has a value of 68.83 cases/100000 inhabitants, close to the European average of 65,194/100,000 inhabitants (Figure 7). High points in the EU box plot (Figure 7) represent the high incidence of mortality in the 74+ age group, as can be seen in Figure 9.

## DISCUSSIONS

Trauma is one of the major causes of death, with nearly 10% of the total deaths. It is very important to evaluate statistically the incidence of trauma as a cause of death at a certain moment in time, but especially in dynamics.

Romania is in a middle position relative to the other European countries, both in terms of the incidence of trauma in 2014 and in terms of the decrease of this incidence between 2000–2014.

In terms of age groups, Romania has a much higher incidence in the range of 0–14 years and, in contrast, an increased incidence in the age group 74+ compared to other European countries.

## CONCLUSIONS

Although the incidence of death-related traumas in Romania shows a significant decrease in recent years and the values in 2014 are comparable to the most developed countries in the rest of Europe, worrying values are recorded in segments 0–14 years and 74+ years.

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