

Particularities in the Evolution of Mortality by Traumatic Events in the Last 30 Years

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Rezumat

Particularități ale evoluției mortalității prin evenimente traumatice în ultimii 30 de ani

Prezentăm o analiză descriptivă și retrospectivă care vizează mortalitatea în țările Uniunii Europene în ultimii 30 de ani. Datele au fost colectate din baza de date a OMS (Organizația Mondială a Sănătății) privind mortalitatea globală. Scopul acestui studiu a fost identificarea particularităților în evoluția mortalității legate de traumă în țările menționate anterior. Rezultatele au arătat modele de mortalitate legate de condițiile socio-geografice la diferite momente din istorie și o tendință generală de scădere a acesteia. Vârsta este, de asemenea, un factor important de luat în considerare. În concluzie, am dori să subliniem lipsa studiilor și cercetării disponibile în domeniul traumatologiei și, de asemenea, să subliniem necesitatea și utilitatea acestora.

Cuvinte cheie: mortalitate, traumă, Uniunea Europeană

Abstract

We present a retrospective descriptive study targeting the mortality in the European Union's countries during the past 30 years. Data was collected from the WHO (World Health Organization) database of global mortality. The aim of this study was the identification of particularities in the evolution of trauma-related mortality in before-mentioned countries. The results showed patterns of mortality related to socio-geographical conditions at different times in history and a general trend towards its decrease. Age was also an

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important factor to take into consideration. To conclude, we would like to point out the lack of studies and available research in trauma-related fields and also to underline their necessity and utility, especially in the pediatric department.

Key words: mortality, trauma, European Union

Introduction

With the emergence of modern methods regarding the storage and analysis of information, the identification of different patterns in the medical field and not only is done with greater ease and accuracy. Since the second half of the 20th century, thanks to the World Health Organization (WHO) being founded in 1948, countries have begun to report data on national mortality. Thus, a very important database has been created that can be analyzed in a historical context to identify the main causes which have led to increased mortality in different geographic areas and use this analysis to prevent such incidents.

The aim of the present study was to identify particularities in the evolution of trauma-related mortality over the last 3 decades in the member countries - at present - of the European Union.

With the establishment of trauma registries and treatment systems for traumatized patients, a global decrease in mortality and morbidity was observed (1).

In countries with increased mortality due to trauma, such as Finland (the fourth highest incidence of trauma-related mortality in the European Union), it is even more important to try and study the causes and the determinants that have led to such a situation. Factors such as the environment (rural or urban), historical background, geographic area, socio-economic status of a country, age and gender have a major influence on mortality and morbidity through trauma (2,3).

Severe trauma is the most common cause of death in the young population (15-44 years) (4), with a predominance of male sex at the expense of females (2,4). For the most part of the

studied period (1980-2014), the whole Europe has experienced a political reorganization associated with multiple violent events that have been matched by an increase in general mortality and also by particular trends for some countries. Thus, we can observe geographic areas where mortality has been increased precisely in times of agitated politics and the conclusion of totalitarian regimes followed by the onset of democracy.

Children represent on average 10% of all trauma cases. However, trauma is among the most important causes of mortality and morbidity in children (0-16 years) (5). A particular and attention-worthy aspect of trauma in children is suspected child abuse, especially in those aged 0-12 months, this particular group being under-tested and often neglected in comparison with those presenting to the physician following accidents or other injuries (6).

Our study also aims to assess, analyze and highlight a general trend towards a decrease in traumatic mortality in children between 1980-2010, which correlates with the information identified by PiaHardelid et al. in their study of child mortality in the four states: England, Scotland, Wales or Northern Ireland (7).

Material and Methods

This study was retrospective and descriptive and used data from the World Health Organization's database on mortality. The research covered the 1980-2014 period and analyzed mortality through traumatic events in the European Union (8).

Results

Population evolution over the period 1980-

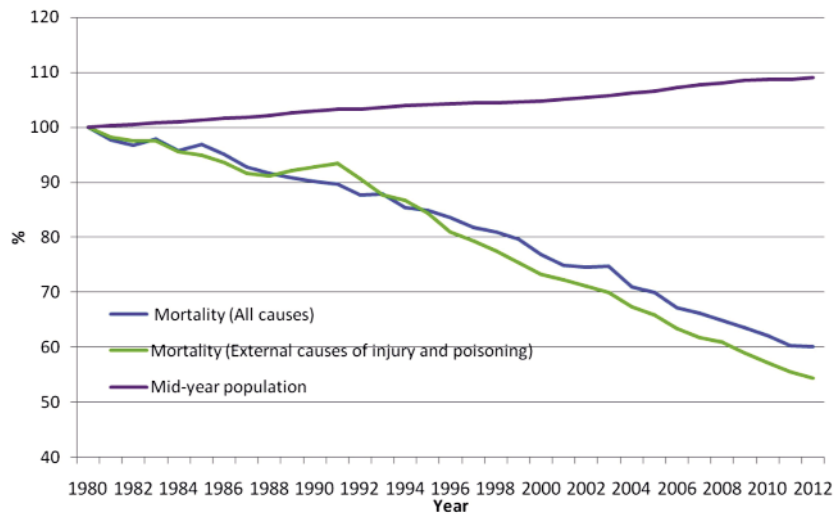


Figure 1. Percentage evolution of mortality rates of various causes and population reported since 1980

2012 showed an increase of about 10%, reaching more than 500 million people in the European Union in 2012. On the other hand, overall mortality decreased by 40 percent. Mortality through traumatic events marked a similar decrease to overall mortality (*Fig. 1*).

The causes considered in the present study to be traumatic are: Accidents, Transport accidents, Accidental drowning & submersion, Accidental poisoning, Accidental poisoning by

alcohol, Suicide & intentional Self-harm, Homicide / assault, Events of undetermined intent.

The breakdown of mortality by age groups reveals an almost constant decrease for just about all age groups, reaching about 55% of the 1980 reference value. A particular variation is observed in the age range of 0-14 years, where the incidence decrease is over 83% of the initial value (*Fig. 2*).

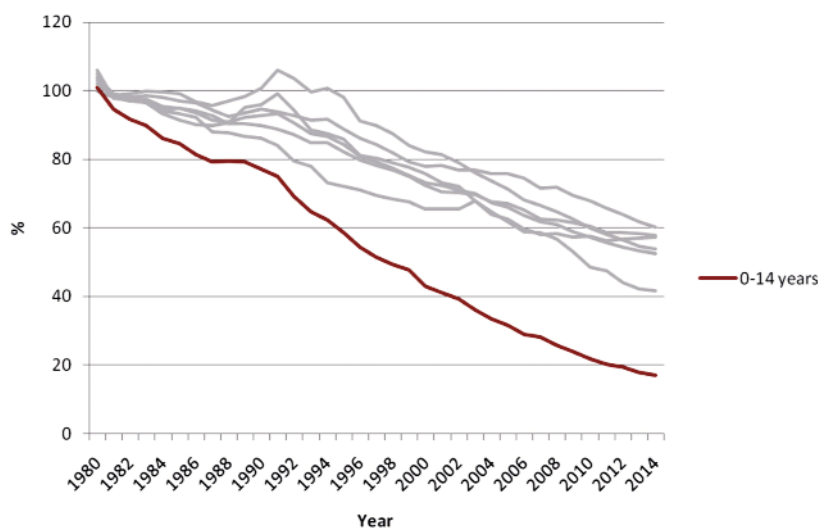


Figure 2. Percentage evolution of the incidence of traumatic mortality among 0-14 age group versus other age groups, reported since 1980

Fig. no. 3 points out that among all the causes of death through a traumatic event, the evolution over time of their values showed particular manifestations in 3 cases:

1. Homicide and assault showed an abnormal increase between 1987 and 1994, followed by a linear decrease.
2. Accidental poisoning, which on average had a steady evolution.
3. Events of undetermined intent showed a sharp decline between 1980-1983 for then to show a linear decrease.

Considering that the data in Fig. 3 shows the European average, we considered it opportune to identify countries that showed marked increases of mortality from Homicide and assault during this period. Thus, we have found an impressive increase in mortality from this cause in Estonia with a reported number 4 times higher in 1994 than in 1988, followed by a rapid decline that is still present. Poland, the Czech Republic and Croatia also showed similar behavior but at a lower amplitude (Fig. 4).

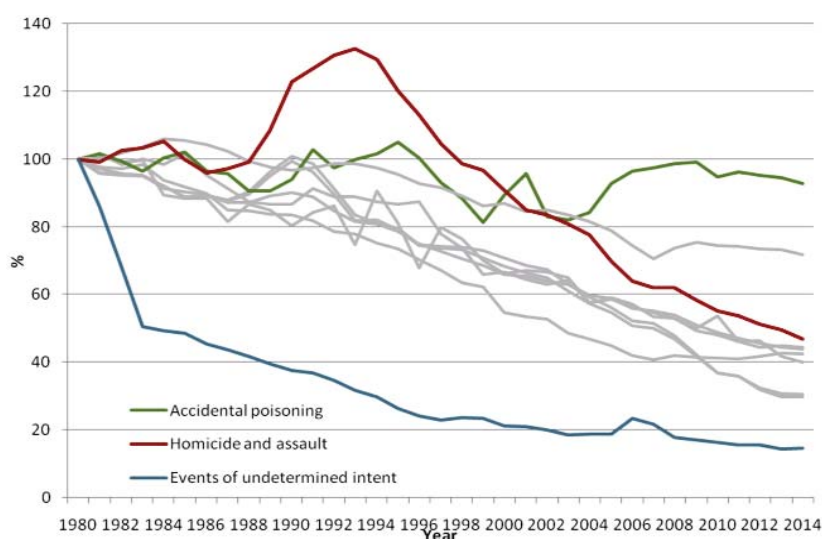


Figure 3. Percentage evolution of the incidence of mortality due to trauma by various mechanisms reported since 1980 (grey lines are all the other mechanisms of trauma)

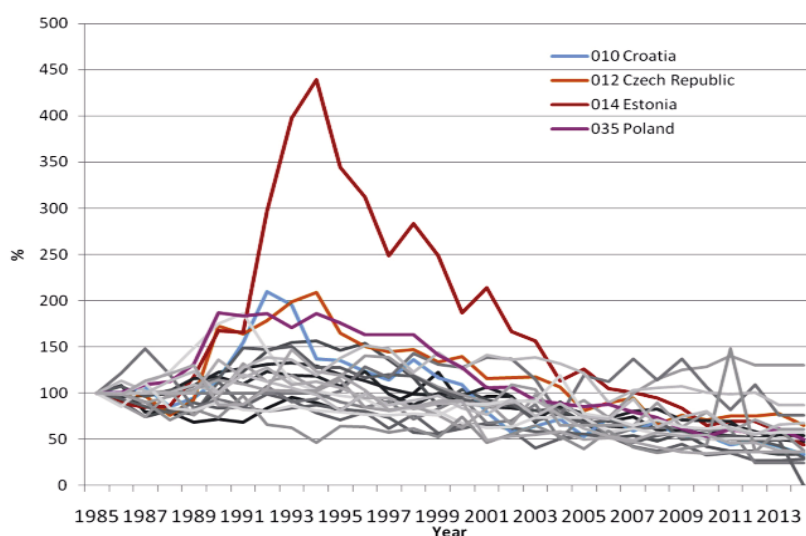


Figure 4. Percentage of the mortality rate caused by Homicide and Assault in the EU Member States, reported since 1985

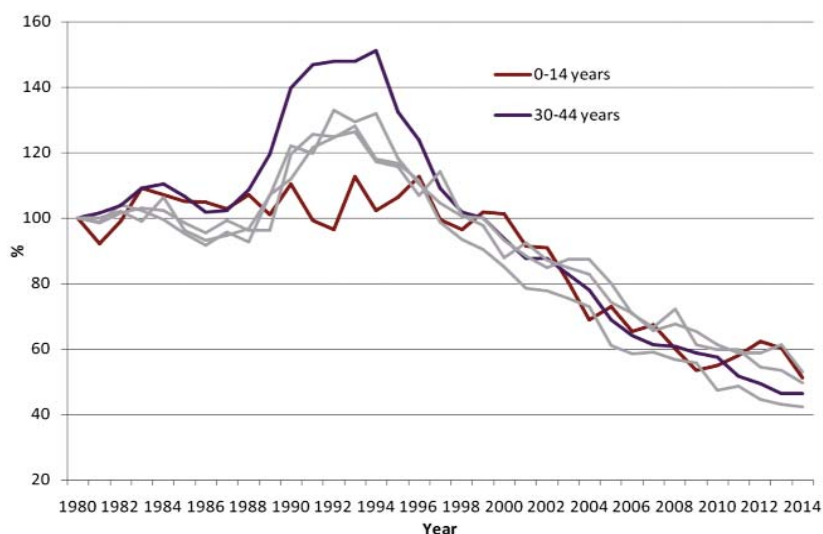


Figure 5. Percentage evolution of the mortality rate caused by Homicide and Assault on various age groups reported since 1980

At the same time, it was timely to identify the age range in which growth was the most pronounced. Thus, we identified a maximum increase of over 50% in the range of 30-44 years and the lack of mortality due to Homicide and Assault in the range 0-14 years (*Fig. 5*).

Discussions

Due to the development of diagnostic and therapeutic management techniques in recent years, there is a marked decrease in mortality due to traumatic events. At the same time, the development of mobile emergency medical services has made prompt interventions at the site of traumatic events possible, thus increasing the chances of survival of these patients (1).

Of all age groups, the most significant decrease was identified in the 0-14 year age range. This particularity is likely of a multifactorial determinism. Most likely, technological development favored the dissemination of information and increased therapeutic possibilities for the pediatric patient, although the currently available data on the treatment of severely traumatized pediatric patients is extremely limited (5).

Mortality due to Homicide and Assault has

witnessed a significant increase between 1987 and 1994, then reaching values similar to the other causes. Most likely at the basis of this particular behavior are historical events independent of the efforts of the sanitary system to deal with these cases, fact supported by the downward slope of this parameter after 1994 (the fall of the Soviet Block in 1991, the Revolution in Estonia in 1989 and violent events due to the onset of democratic regimes in ex-Soviet countries such as Estonia, Poland, Czechoslovakia). In 1988, after a few years of Martial Law, Poland was the host of multiple strikes where many people died in conflicts with the government troops. These changes have created a cascade of events that led to many Eastern European countries' revolutions and independence gains (known as the Autumn of Nations). In 1989, the Sung Revolution took place in Estonia, after which the country came out of the domination of the communist bloc and gained its independence. However, it remained the host of Russian troops until 1994, when the last of them left the Estonian territory (9). The conflicts have lasted years after these revolutions, in an attempt to restore a communist regime. Because of this, probably, we see that the downward slope in mortality due to Homicide

and Assault in these countries appears only in the second half of the 1990s.

The uneven distribution in the EU countries with a marked increase in Estonia, the Czech Republic, Poland and Croatia supports this theory. Another factor that confirms the hypothesis is age distribution that highlights an increased value in the range of 30-44 years, as well as a minimum increase in the 0-14 year range, adults being those who participated in violent acts at the expense of children, and of the elders.

Mortality due to Accidental poisoning showed an approximately stationary evolution, now the value being less than 10 percent from the 1980s. One of the most important causes of accidental poisoning is drug intoxication. Easier access to these potentially lethal substances has resulted, perhaps, in a compensation for the evolution of treatment methods (10).

The marked decline in Events of undetermined intensely causing death has as a probable cause the development of legal medicine techniques that have greatly facilitated the identification of causes of death and the circumstances in which they have occurred.

Conclusions

Mortality caused by the various causes of trauma often evolves independently of the actual causes and is sometimes influenced by the external factors that favor the occurrence

of the traumatic event as well as by the medical possibilities of prompt, diagnostic intervention along with a targeted and individualized therapeutic management.

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