

## ACUTE POISONING MORTALITY RATE IN PLOVDIV REGION, BULGARIA

YANKO ILIEV, VALENTIN AKABALIEV  
AND IVAN DOYCHINOV

*Higher Medical Institute, Plovdiv,  
Bulgaria*

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The severe recession in Bulgaria which followed the collapse of the totalitarian regime in 1989 had an unfavourable impact on the health status of the population. Systematic studies of acute poisoning mortality rate in the transitional period (1990-98) are scarce in the post-totalitarian Eastern European countries and are lacking in Bulgaria. This retrospective study analysed 1,150 deaths due to acute poisoning in Plovdiv Region for the period 1961-98. Acute poisoning mortality rate was moderately high in the period between 1990 and 1998 with respect to the average of 4.99 per 100,000 a year. It grew steadily during rapid socialist industrialization (1961-90) and showed a trend of slight decrease during transition (1991-1998). The decrease may largely be accounted for by the foundation of the regional toxicological centre and to a certain degree by a drop in industrial and agricultural production and exposure to hazards.

*Key words:*  
health crisis, suicidal poisoning, totalitarian regime,  
transitional country

In the 70-ties many authors noticed the health crisis in the countries of Eastern Europe and the alarming worsening of total mortality rate and of average life expectancy in comparison to the countries of Western Europe all through the 90-ties (1-6). This health crisis was compared even to the crises typical of war or periods of natural disaster and famine (7). The main factors contributing to the increase of mortality rate - principally among men - in the former socialist countries were the unfavourable combined effects of

alcohol and tobacco abuse, unhealthy dietary habits, obesity, environmental pollution (4), and inefficient health care systems in those countries (3). According to Murray and Bobadilla, the cause of the increase in the mortality rate is more complex (8).

Systematic studies of acute poisoning mortality rate during the period of transition to market economy and democracy are scarce in the transitional Eastern European countries and are completely lacking in Bulgaria. The purpose of our study was to analyse the acute poisoning mortality rate in a representatively large Bulgarian industrial and agricultural region in this neglected transitional period (1990-1998) and compare it with the earlier findings for 1961-1989.

Acute poisoning ranks 3<sup>rd</sup> as the cause of death in the group of traumas, poisonings and injuries (9), ranging in some countries from 2/100,000 through 10/100,000 (9-15). Acute poisoning mortality rate in the Bulgarian district of Dobrich before transition (1975-86) was 3.89/100,000 (12). A decrease of acute poisoning mortality rate was reported for Zagreb, Croatia from 8/100,000 in 1968-1980 to 5/100,000 in 1981-1990 (15). Acute poisoning mortality rate in hospitals also shows great variation (0.1% through 32%) across different countries (16-23).

## SUBJECTS AND METHODS

Plovdiv Region is situated on the south of Bulgaria and comprises approximately 5% of the territory and 8.8% of the population of the country. Its demographic and health care characteristics are similar to the other regions in the country.

The emergency service for acute poisonings was started in Plovdiv Region by Plovdiv Emergency Municipal Service. The Higher Medical Institute of Plovdiv has been providing treatment of all acute adult poisonings through the Toxicology Clinic from 1990 and forensic medical appraisal of acute poisoning deaths through the Department of Forensic Medicine.

The population data, total mortality rate, and injury mortality for Bulgaria and Plovdiv Region have been taken from official statistical sources (24). The acute poisoning mortality data for Plovdiv Region have been collected from the Toxicology Clinic records and autopsy reports of the Department of Forensic Medicine.

The retrospective study analyses 1,150 deaths by acute poisoning in the Plovdiv Region from 1 Jan 1961 to 31 Dec 1998. To make it simpler, the period from 1961 to 1989 is referred to as the socialist period and from 1990 to 1998 as the transitional period.

The main cause of death was determined by forensic medical expertise. The character of death (accidental, suicide, or homicide) was determined through cumulative evidence from the judicial inquiry, clinical course of the disease, and the forensic medical expertise. The deaths have been coded according to the criteria of International Classification of Diseases, 9th edition (25). Both sets of codes were used: the diagnostic codes and the E-codes (external cause of death).

## RESULTS AND DISCUSSION

Up to the year 1997, Bulgaria and Plovdiv Region were showing a trend of steady increase in the total mortality rate in the transitional period (Table 1). However, deaths by trauma, poisoning, and injury, show moderate variation without a discernible trend. Acute poisoning mortality rate in the same period in Plovdiv Region varied slightly, showing a trend toward a slight decrease. It is surprising enough that acute poisoning mortality rate in Plovdiv Region remained moderately high in the transitional period which brought severe recession and health crisis. It averaged 4.99/100,000, varying from 4.25/100,000 in 1998 to 6.21/100,000 in 1993.

Table 1 Demographic and epidemiological data for Bulgaria and Plovdiv Region for the period 1990-1998

Year	Bulgaria			Plovdiv Region			
	Population		Mortality rate	Population		Mortality rate	
	Total*	Total**	Traumas, poisonings, injuries ***	Total*	Total**	Traumas, poisonings, injuries ***	Acute poisoning ***
1990	8,718.3	12.1	61.9	788.1	11.0	53.1	6.1
1991	8,632.4	12.3	57.9	791.3	10.9	55.6	5.3
1992	8,540.2	12.4	68.5	765.1	11.2	66.8	4.4
1993	8,472.3	12.9	65.4	740.3	11.7	67.1	6.2
1994	8,443.6	13.2	69.4	741.2	12.0	66.6	4.3
1995	8,406.1	13.6	65.8	739.8	12.3	65.6	4.3
1996	8,362.8	14.0	64.0	735.4	13.0	61.3	5.0
1997	8,312.1	14.7	60.7	731.1	13.9	58.0	4.3
1998	8,230.4	14.3	-	729.4	13.4	66.3	4.2

\* Average population per year (in thousands)

\*\* Per 1000 population

\*\*\* Per 100,000 population

During that period, 1991-1998, the distribution of population who died of acute poisoning by residence is: urban 199 (61%), rural 118 (36%), and with no permanent residency 10 (3%). The domination of urban residents reflects the fact that the majority of the Plovdiv Region population lives in towns and cities (71.2%). With that in mind, one may note that acute poisoning mortality rate in rural areas is in fact higher than in the cities, that is, 6.29/100,000 v. 4.25/100,000. This fact may be accounted for by the higher level of alcohol abuse, widespread exposure to pesticides in agriculture, unawareness of toxicological risks, and a lower level of emergency services.

According to the character, 150 poisonings (46%) were assessed as accidents and 177 (54%) as suicides. The average acute poisoning mortality rate in Plovdiv Region during transition was 2.21/100,000 from fatal accidental poisoning and 2.61/100,000 from suicidal poisoning. Homicides were not encountered in the sample.

Figure 1 shows acute poisoning mortality rates in the transitional and the socialist period. The trend follows a bi-phase pattern, that is there are two clearly separated tendencies. From 1961 to 1989, acute poisoning mortality rate had a sustained increase, reaching its peak in 1986 - 1989; from the year 1990 the trend showed a slight, but sustained decrease.

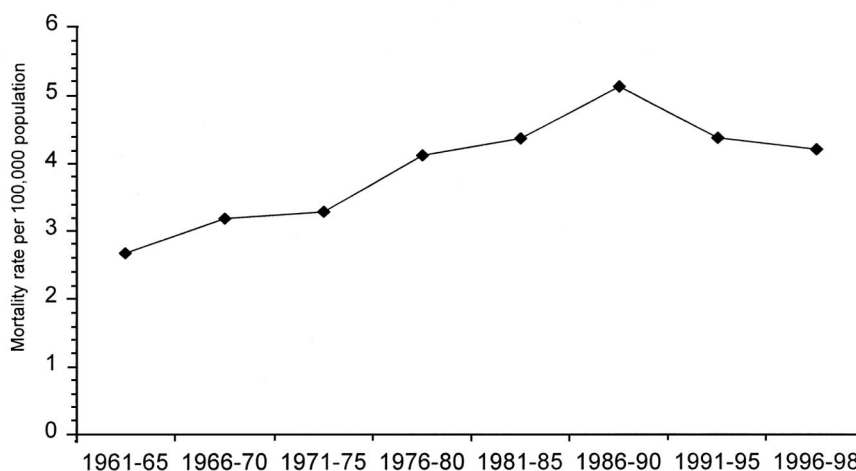


Figure 1 Acute poisoning mortality rate in Plovdiv Region for the period 1961-1998

A comparison shows that the index of acute poisoning mortality rate in Plovdiv Region in the transitional period is higher than that reported for another Bulgarian region in the socialist period (12) and lower, but comparable to that in Zagreb, Croatia (15) and the USA for the respective periods (9). It is considerably lower than in some other European countries such as Switzerland (10) and Eastern Denmark (11).

The most likely reasons for the steady rise of acute poisoning mortality rate in 1961-1990 are rapid industrialisation and exposure to hazardous chemical products, massive use of pesticides in agriculture, increased alcohol consumption, unhealthy dietary habits, and higher mortality due to the lack of specialised toxicological service.

By analogy, the decreasing trend of acute poisoning mortality rate for the period 1990-1998 may be associated with a serious drop in industrial and agricultural activity and exposure to hazardous chemicals, as well as to the eightfold decrease in acute poisoning hospital mortality rate averaging 2.5% in 1990-98. The latter is mainly due to the establishment and development of a regional toxicological centre and reorganisation of pre-hospital medical service, both coinciding with that period.

The reform seems to have effectively improved the National Health Care System as a powerful instrument in combating acute poisoning mortality. However, its role in reducing acute poisoning mortality is limited to hospitals at the moment. It seems that only the improvement of social and economic environment is expected to bring a comprehensive beneficial effect, and it is the task of everyone involved to contribute.

There are no separate data for accidental or suicidal poisonings for the socialist period (1960-1989). This does not allow us to determine to what extent acute poisoning mortality rate and especially its subcategory "suicidal acute poisoning" reflect social and economic crisis in the days of the totalitarian regime. More complex and socially oriented studies are necessary to answer that issue.

## CONCLUSIONS

The indicator acute poisoning mortality rate in Plovdiv Region is moderately high (on average 4.99/100,000 a year) for the transitional period 1990-1998. Acute poisoning mortality rate is higher in rural than in urban areas (6.29/100,000 v. 4.25/100,000), possibly due to a greater alcohol abuse, exposure to pesticides, unawareness of toxicological risk, and lower level of emergency services. Acute poisoning mortality rate was increasing in the socialist period (1961-1990), but showed a trend of slight decrease in the period of transition (1990-1998). Institutionalised poisoning management can effectively suppress acute poisoning mortality rate in the times of severe health and economic crisis in post-totalitarian East European countries.

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*Sažetak*

**SMRTNOST OD AKUTNIH OTROVANJA U PODRUČJU PLOVDIVA U  
BUGARSKOJ**

Nakon pada totalitarnog režima 1989. godine, socioekonomska kriza što je zahvatila zemlju odrazila se negativno na zdravstveno stanje populacije. Sustavna praćenja akutnih otrovanja tijekom tranzicijskog razdoblja u Istočnoj Europi su oskudna, a u Bugarskoj ih nije ni bilo. U ovom se radu retrospektivno analizira 1150 slučajeva akutnih smrtnih otrovanja u području Plovdiva, i to u razdoblju 1961-1990. u vrijeme intenzivne industrijalizacije. U tom je razdoblju stopa smrtnosti od akutnih otrovanja stalno rasla dosegnuvši maksimum između 1986. i 1989., a nakon toga je počela lagano opadati. U razdoblju između 1990. i 1998. smrtnost od akutnih otrovanja iznosila je 4,99 na 100.000 stanovnika. Spomenuti trend opadanja smrtnosti pripisuje se osnivanju regionalnoga toksikološkog centra, kao i usporavanju industrijske i poljoprivredne aktivnosti s posljedicom smanjenja ekspozicije toksičnim tvarima. U smanjivanju stope smrtnosti od akutnih otrovanja posebnu ulogu imaju dobro planirane i provedene preventivne mjere.

*Ključne riječi:*

akcidentalna otrovanja, socijalno-medicinske posljedice, suicidalna otrovanja, toksične tvari, tranzicijsko razdoblje, zdravstvena kriza

Requests for reprints:

Yanko Iliev, M. D.  
ICU High Medical Institute  
Department of Occupational Diseases and Toxicology  
15-a V. Aprilov boulevard  
4000 Plovdiv, Bulgaria  
E-mail: [yanko54@hotmail.com](mailto:yanko54@hotmail.com)