ANALYSIS OF THE DROWNED PEOPLE ON THE TERRITORY OF THE SLOVAK REPUBLIC IN YEARS 1991-2000 AND 2001-2010

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ABSTRACT

The paper deals with the issue of risk level of the water environment in focus on the number of drowned people in Slovakia in years 1991-2010, statistically evaluates and analyzes the number of drowning victims in 10 years periods in terms of the nature of the water surface and the most common causes of drowning and age and specifies the major causes of drowning. In scientific work was used the method of content analysis of official injuries protocols in the water environment in the reporting period 1991-2010, the method of mathematical statistics, interview method in rescue participants and questionnaire to members of the Fire rescue service, Police Force and Water Rescue services. The authors have used the information provided through electronic media data (www). Based on the present analysis, the statement can be said that the statistics of the number of people drowned in the area of Slovak Republic reported high numbers every year. In order to reduce these numbers to the minimum, it is necessary to perform a lot of work especially in the field of prevention and awareness among the general population as well as in the training of water rescue members.

It will be strictly necessary to finalize the main area of legislation which must be harmonized with EU legislation. The fulfilment of this process will require the involvement of a wide range of professional and volunteer staff of Water Rescue Service as well as other institutions (Parliament of Slovak Republic, schools, foundations, city and municipal councils), which are involved in physical activities of the population in area of water environment.

Key words: drowning, water rescue, recreational activities, floods, swimming

INTRODUCTION

Slovakia is landlocked country in central Europe. It has an area of 49,035 square kilometres and is home to approximately 5, 43 million of inhabitants. It borders with Czech Republic, Austria, Poland, Ukraine and Hungary. The main and most populous city is Bratislava.



Despite of inland character, Slovakia is a country with many rivers, natural and artificial water areas and lakes. In hydrological characteristics of Slovakia and its usefulness with regard to recreational activities of population, it could be said that in Slovakia is registered 252 indoor swimming pools, 49 774 km of rivers, 7 518 km of irrigation channels and 338 natural and artificial water reservoirs, from which only the top 10 cover an area of 190 square kilometres (LAUKO, 2003).

It should be mentioned that statistics and research were primarily focused on medical reports, which characterize the cause of death as drowning and the reports of event. This means that in the database is included cases of drowning, when the person was not only the participant of recreational activities in water environment, but the cause of drowning could be flood, crime or special incidents regarding fall into the water well, septic tank, open pits and the like. For this reason are data processed separately and only from those locations where is activity of rescue swimmers unlikely.

For needs of this publication, we cite the statistics of persons drowned in Slovakia in ten years seasons during 1991-2000 and years 2001-2010. In comparison of these time stages, we also present a competition of data in terms of the most common causes, nature of water surface and age.

RESULTS

Based on statistics of period 1991-2000 and 2001-2010, it can be concluded, that Slovakia is on average 128 people drown each year. Overall, it is registered for reference period 2562 people drowned. (Fig. 1)

As shown in the chart, a significant increase in the number of drowned people is registered in the year 1991 (189 persons) and in 1998 (233 people) (HUČKO, 2007). This fact can be attributed to the fact that in these years prevailed in the summer period, extremely hot weather, resulting in significant increase of interest of people seeking for the possibility of water recreational activities. The evidence of this theory is the year 2001 (53people) when in summer months prevailed lower average daily temperatures.

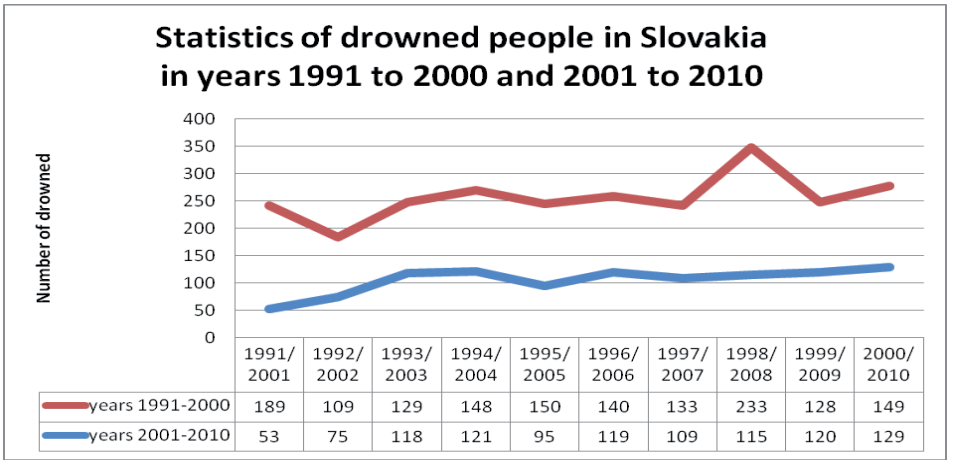

Figure 1
Statistics of drowned people in Slovakia in years 1991 to 2000 and 2001 to 2010

The risk level for activities in water environment is largely given by its character. Hydrological conditions of water flows by their nature induce risky situations which is impossible to meet in the swimming pools or not flowing waters. These are mainly of velocity of water flow, depth variation, the existence of obstacles below the water surface, in most cases significantly lower water temperature, flow, return flow, water rolls at weirs etc. (MILER, 1999). In addition to these specific hydrological peculiarities, the water flows allow the usage for various entertainment activities (jumps to the water) the banks, bridge elements and vegetation at the banks. All these factors are mainly attractive for youth population and naturally create potential danger. Standing water or water areas such as dams and water reservoirs show specific risks arising mostly from their large surface area. The most frequent risks are resulting from climate change, which on the larger tanks can course the increase of waves from a few centimetres to 1, 5 meter and directly endanger the safety of swimming people. (LAURENCOVA, 1991). In comparison of percentage of persons drowned in the area of Slovak Republic in the years 1991-2000 and 2001-2010 according to the nature of the water surface (Table 1), it can be stated in the reporting categories a decrease in the number of people drowned.

Table 1 Percentage comparison of the number of people drowned in the Slovak Republic in the period of years 1991-2000 and 2001-2010 according to the nature of the water surface

Character of water surface	1991-2000	2001-2010	+/- %
Running waters	842	592	-29,6 %
Standing waters	254	192	- 24,4 %
Pools	27	15	- 44,4 %
Reservoirs	171	124	-27,4 %

As one of the key factors that influenced this fact can be considered the activity of more than 1 300 active members of the Water Rescue Services (later WRS), and the introduction of security measures, for example swimming sectors, sectors for water sports and so on, where has been applied increased protection by rescue swimmers. Running flows have in terms of preventive and direct rescue service specific requirements, which cannot be provided with fully qualified rescue swimmers because of financial and personal reasons.

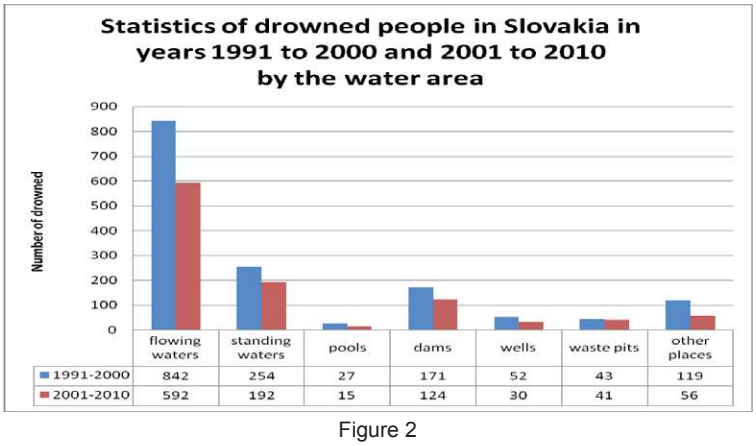

Figure 2
Statistics of drowned people in Slovakia in years 1991-2000 and 2001-2010 by the water area

In the evaluation of the number of drowned people in relation on the nature of the water surface (Fig. 2) it can be concluded that the dominant position is having running water. It should be noted that Slovakia has a relatively dense network of waterways and it is difficult to expect that youth people living on the river banks will go swimming in swimming pool respectively in swimming pool to the nearest town. In this context, it is not possible expect in a short time from state institution that have limited financial resources to build swimming pools and finance Water Rescue Services. As shown in Figure 2, the lowest figures recorded are drowned people in swimming pools. This fact can be explained in a more active (stricter) applying the legal standard that requires the providers of swimming pool to ensure the health and life safety by qualified members of the Water Rescue services.

From graphic illustration of drowned people in terms of most common causes (Figure 3) it is evident that if we exclude the category „other reasons“ (waste pits, water wells, drowning as a secondary consequence of another primary cause, crime, accidents, etc..) is dominant alcohol consumption. This fact is somewhat specific for Slovak Republic. Paradoxically, it should be noted that potential producers of this risk factor with regard to health and life threatening activities in water environment, especially on artificial and natural open-water areas (kiosks, snack bars, restaurants, hotels) do not contribute financially to the activities of WRS. Naturally, refreshment facilities are a desirable part of public recreation in areas of swimming pools. The combination of alcohol, high daily temperatures and the innate disposition of the motion in diametrically different physical conditions in water environment (in extreme cases, for example difference between the temperature o fair and water temperature could reach up to 20 degrees) and in case of insufficient estimation of their own abilities, it can lead to induction of risk situation.

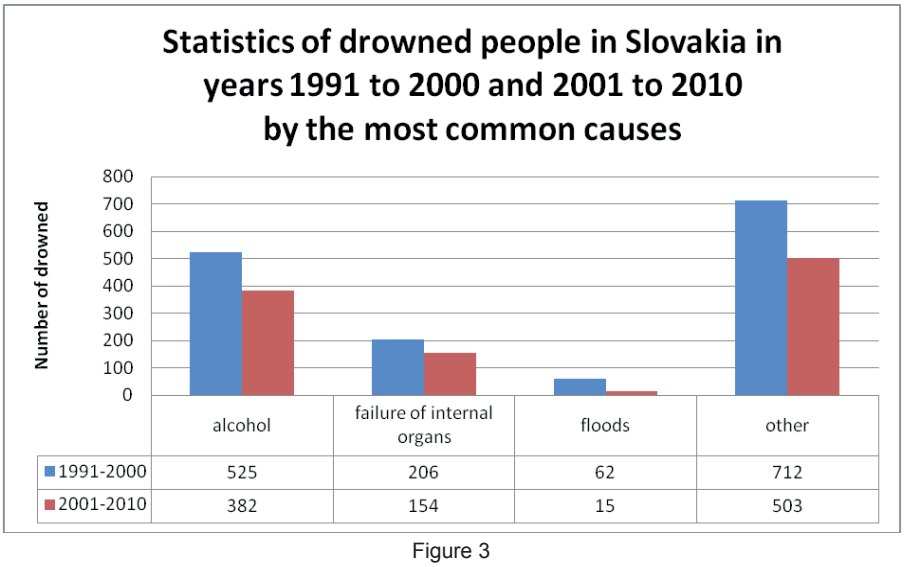

Figure 3
Statistics of drowned people in Slovakia in years 1991-2000 and 2001-2010 by the most common causes

In the percentage of comparison of drowned people in terms of the most common causes during 1991-200 and 2001-2010, it can be reported decrease of alcohol consumption as a cause of drowning by 27,2% (table 2). This fact can be attributed to the increased activities of members of WRS and other security forces. It is important to emphasize that in comparison with the period before 1989 has especially in open-water and artificial water areas improved cooperation with the members of municipal and state police service, which the cases of excessive consumption of alcoholic drinks are handled resolutely.

In the period 1991-2000 appears in the statistics increased number of people drowned during floods. These events, respectively individual cases cannot be predicted, mainly in terms of procedure of the particular person, who finds himself/herself in danger, despite the fact that in the event natural disasters people were aware of potential risks. As a rule, rescue of personal property is strong stimulus, which decreases the rational behaviour of effected people in risk of their own health and life. These situations occur in case of floods over large area and it is impossible act by rescue forces, immediately in the specific location.

Table 2 Percentage comparison of the number of drowned people in the Slovak Republic in the period 1991-2000 and 2001- 2010 in terms of the most common causes

Cause	1991-2000 (1032 people)	2001-2010 (1010 people)	+/- %
Alcohol	525	382	- 27,2 %
Apparatus failure	206	154	- 25,2 %
Other	712	503	- 29,3 %
Floods	62	15	-75 %

Statistics relating to the number of drowned people in terms of age (Table 3) show that except for the categories of persons aged 51-60 years in which there was an increase in the number drowned, in all other monitored ages, the number of drowned people decreased in years 2001-2010. In previous researches conducted in the years 1989 – 1996 and 1997-2004 (BARAN,2006) was registered an increased number of drowning victims in all age categories except age group into 30,40 and over 60 years. Fact that was reduced the number of registered drowned people in all age group except for age category into 60 years can be attributed to re-restoration of swimming courses for all levels in schools, improving the economic situation of the population, which enabled higher participation in recreational physical activities in water environment, increasing the offer of recreational swimming facilities and health supporting swimming activities. The increased workload and reduced physical activity and the associated increase in cardiovascular diseases in the age group 51-60 years can be characterized as one of the reasons for increase in the number of drowned people in this age group. Highest statistical results show the age categories, which are generally characterized as active age (21-30 and 41-50 years). In this context, it can be concluded that vast majority of these cases prevailed overvaluation of own strength and abilities. (Fig. 4)

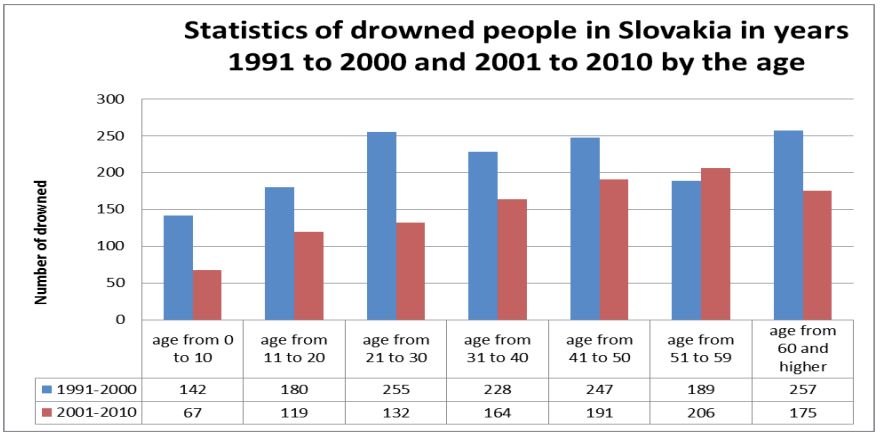

Figure 4
Statistics of drowned people in Slovakia in years 1991-2000 and 2001-2010 by the age

In evaluation of the percentage of drowned people in the Slovak Republic in the years 1991-2000 and 2001-2010 in terms of age is a positive decrease of the number of drowned people in all age groups except for 51-59 years old.

Table 3 Comparison of the number of drowned people in the Slovak Republic in the years 1989-1996 and 1997-2004 according the age

Age category	1991-2000	2001-2010	+/- %
until 10 years	142	67	52 %
until 20 years	180	119	33,8 %
until 30 years	255	164	35,6 %
until 40 years	228	164	28 %
until 50 years	247	191	22,8%
until 60 years	189	206	+ 8,9%
over 60 years	257	175	31,9 %

The causes of this fact can be described as multi-criteria. The main factors can be considered restoration of swimming courses in schools, improving the Access of population to the swimming activities and wider choice of swimming pools and aqua parks. Reducing the number of people drowned in the group of 10-50 years can be attributed to increased interest of population in various sports activities in which people improve their sports performance. Currently, there are summer activities in a wide range of public and commercial companies providing swimming courses, diving, boating and other activities in the water environment.

CONCLUSION

In relation to the risk profile of the water environment is most often mentioned drowning. Drowning is usually characterized as death caused by stewing because of lack of oxygen.

Near drowning describes a situation, when human temporary survived (BARAN, 2006). Near drowning as a situation is essentially a set of events, respectively human activities leading to drowning. The process of drowning is variable and influenced by the given circumstances. (PALKOVIČ, 2003).

After comprehensive evaluation of official documents, it can be concluded that the major causes of drowning in Slovakia in monitoring period were:

A/ Insufficient level of swimming skills and abilities
(Non-swimmers, weak swimmers)
B/ Causes resulting from circumstances avoiding direct correlation to the quality of acquired skills of swimming ability:
(Primary and secondary health problems)
C/ Causes resulting from specific risks of standing water:
(Overvaluation of own skills)
D/ Causes resulting from specific risks of running water:
Strong flow, water swirls, dangerous waterfalls)
E/ Cause resulting from specific risks of pools, swimming pools, aqua parks:
(Jumping facilities, toboggans, slides, underwater tunnel, etc.)

Therefore, all concerned people should provide maximal effort to eliminate these risks and to pay adequate attention to safety of swimming courses for children and adults.

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