

Profile of drowning deaths at swimming pools and bathtubs in Brazil – A 9-years evaluation (2003-2011)

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Drowning is a complex process from the perspective of prevention that needs a lot of information to be fully understood. High quality information is essential for a successful strategic prevention campaign. In 2012 the Brazilian population was 194 million inhabitants, of which 1,1 million died. External causes were responsible for 13% of all deaths, and among the first two reasons of death for people aged between 1 and 44 years old. Drowning was responsible for 6.369 deaths(3,3/100.000 inhabitants) and was the second leading cause of death for all deaths of children aged 1 to 9 years old, the third among 10 and 19 years old, and the fourth among 20 to 25 years old. The risk of injury in aquatic settings was estimated to be 5,03/100.000 inhabitants considering drowning and other related trauma (Szpilman-2014). When considering all age groups together, pools and bathtubs were locations of limited relevance for drowning deaths, representing only 2% of all deaths by drowning(n=144 in 2011). The aim of this study was to characterize the drowning profile at pools and bathtubs in Brazil, from 2003 to 2011, and use that information to understand and manage the risk of drowning at these areas.

Methods

Drowning rates among Brazilian residents were determined using death certificates from 2003 to 2011 based on DATASUS—the Public Health System Information of Brazilian Government (www.datasus.gov.br), using the International Classification of Disease for drowning (ICD 10): W65 - while in bathtub; W66 - fall into bathtub; W67 - while in swimming pool; W68 - fall into swimming pool. The number of pools was estimated based on data on chlorine use by industries and pools manufactures (ANAPP).

Results

There were 61.857 drowning deaths (3,6/100.000 inhabitants), averaging of 6.970 per year, in Brazil along the 9 years of the study (2003-2011). There was no overall statistically significant decrease in incidence of drowning from 2003 (3,8/100.000) to 2011 (3,4/100.000). Pools and bathtub were responsible for 2,3 (n=1395) of all cases (pools:2%,bathtubs:0,3%). There was no significant difference among those 2 locations and both were predominantly the places where children under 4 years-old drowned (38%). Among all deaths at pools 54% afflicted 1-9 years old. Pools were the location of 53% of all drowning deaths at that age range and 76% between 1 to 29 year-old. Considering the setting, 49% of those deaths were domestic, 10% at clubs and gyms and 7% at schools. Drowning rates “while in swimming pool” were 2 times higher than the rate of drowning deaths due to “fall into swimming pool”. The most affected population groups were Caucasians and people with lower educational level. Males died in average 3 times more frequently than females. The difference was significantly higher for the age groups 25-29(16x) and 35-39(47x). Geographically, the highest rates of death were found in the southwest region (42%) but the centre region represented the higher risk (1 death/million inhabitant). Furthermore, 44% of all deaths happened during summer. For the whole country we estimated the existence of 1,7 million ground pools (including domestic or not) with an associated estimated risk of 1 death per 639 pools per year, considering a pool lifetime of 20 years. Gross National Income per capita was a determinant risk factor for drowning in Brazil, directly proportional to the number of pools and inversely to other aquatic locations. The total estimated cost for drowning death at pool was US\$12 million/yearly.

Discussion

This study reveals that pools and bathtubs are important risk locations for drowning, especially for children aged 1 to 9 years-old, during summer time, at the most HIC regions and at domestic settings. This information is essential for planning increasingly cost-effective educational campaigns directed at the highest risk groups.