



## Cost benefit study of a safety campaign's impact on road safety

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### ABSTRACT

The aim of this paper is to identify a break in the development trend of the time series of the number of fatal, light and heavy injuries in traffic accidents and compare the progress caused by the media campaign named “Think or you’ll pay!” in the Czech Republic over the period 2000–2015. The campaign focuses on the age group of drivers under the age of 25 and the most common cause of their traffic accidents as the drivers in this age category are the most vulnerable group in road traffic. The campaign uses a method in which it tries to influence behaviour by negative action, or by causing negative emotions.

The authors concentrate on the effects of mass media campaigns in the long-term development of accidents in the Czech Republic and a financial evaluation of the road safety campaign “Think or you’ll pay!” by comparing the campaign costs, the cost of road fatalities, and the cost savings from the perspective of government expenditures.

The secondary source data for the chart analysis and interpolation according to the criteria of analytical and mechanical balancing time series, the Chow test and Quandt Likelihood Ratio test, choosing the appropriate model trend of accidents and consequences of traffic accidents were obtained from the Czech Ministry of Transport, the database of The Losses due to Traffic Accident Rates (CZRSO) and the Czech Association of Victims of Traffic Accidents (CSODN, 2015) from period of 1990 till 2016.

The impact of the media campaign “Think or you’ll pay!”, measured by enumerating the costs was compared with the number of fatalities in the years immediately after the campaign and the impact of the media campaign was evaluated and recognised. The conclusion and the highlights summarize the findings of research and the limits of media campaign evaluation approach.

### 1. Introduction of traffic safety in the Czech Republic

Worldwide, more than 1.2 million people die annually in highway-related crashes and as many as 50 million more are injured. By 2030, highway-related crashes are projected to be the 5<sup>th</sup> most frequent cause of death in the world (World Health Organization, 2013). Road safety has become one of the basic indicators of society's maturity in the motorized countries worldwide. By Michalakia et al. (2015) the factors affecting road accident severity can be divided into two categories: engineering (refer to road infrastructure characteristics, traffic conditions, and ambient conditions.) and human (Michalakia et al. 2015). The relationship between road traffic accidents and geometric design variables, such as curvature, vertical grade, lane width, and hard-shoulder width has been empirically investigated through statistical models in several studies (Haynes et al., 2008; Jamroz, 2012; Kononov et al., 2012). Regarding traffic conditions, speed appears to be important in all its alternative forms, as average speed, speed limits and speed variation, traffic flow, traffic density, and congestion are also important

factors. The influence of weather conditions can be also expressed as significant (Golob, Recker, 2004; Elvik et al., 2004; Aarts and van Schagen, 2006; Wang et al., 2009). Human factors play an extremely important role in road accidents. Because of the heterogeneity of this group of drivers, there have been set several segments of their approach to the risk of being involved in an accident (Charbotel et al., 2001; Hausteine, 2012, Boninger et al., 2014). Several studies have examined the influence of age, gender and discounting the future tendencies of levels of perceptual certainty of apprehension (Nordbakke, Sagberg, 2007; Freeman et al., 2017). In particular, the difficulty responding to traffic hazards, managing speed for evolving road conditions, and maintaining appropriate space from other vehicles are common skill deficits of adolescent drivers. The results also have showed that the younger driver group had significantly higher proportion of speeding drivers, tailgating drivers, and higher-crash-risk drivers (Mayhew et al., 2003; McKnight and McKnight, 2003; Feng et al., 2017). A sizeable body of scientific evidence (Byrnes et al., 1999; McGwin, Brown, 1999; Nell, 2002; Li et al., 2003; Siren et al., 2004; Oxley et al., 2006; Lewis

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et al., 2007; Dickerson et al., 2007; Apicella et al., 2008; Evans and Hampson, 2014) also indicates that males are more likely to take risks compared to females. Male drivers had significantly higher proportion of speeding drivers compared to female drivers.

It is widely known that in the Czech Republic, especially after the "Velvet Revolution" in 1989, there has been a significant increase in accidents and consequent losses of human lives, which were caused mainly by the risky behaviour of all road users, due to unconscious tragic consequences, non-observance of the basic safety rules and, of course, by other factors, such as the decline in police surveillance and restrictions, the increase in sales of new cars, the importation of used and often outdated vehicles and by poor education of young drivers in schools. The main problems in road traffic have included speed and aggression on the road, the use of safety restraint systems and driving under the influence of alcohol or others psychotropic substances.

Compared to other EU members, the Czech Republic in 2008 ranged from 27 countries to 18 with the highest number of human lives lost in traffic accidents. According to the Directorate of roads and motorways, in the Czech Republic, there exist nearly 56 thousand km of roads and highways. Together with the continuous increase in the length of roads and highways a negative aspect was also connected, i.e. the accidents. On the roads within the Czech Republic a total of 98,864 accidents occurred during the year 2016. 545 people died during these accidents, 2580 people were seriously injured and 24,501 of them were slightly injured. The total material damage reached to almost EUR 232,000 (CZRSO, 2015, Autosap, The Infrastructure of Road Transport, 2017). Based on the above facts, the accidents on Czech Republic roads have become one of the main social issues.

### 1.1. Introduction of the "Think or You'll Pay" safety campaign

"Road traffic injuries claim more than 1.2 million lives each year and have a huge impact on health and development. It costs governments approximately 3% of GDP." (Global status report on road safety, 2015, p. ix) The media campaign named "Think or you'll pay" was realised by the Ministry of Transport of the Czech Republic in a period lasting two years, from October 1st 2008 till December 31st 2010, with the aim divided into three main areas:

- 1 Reduce 2010 the number of road accidents and deaths resulting from them in the year 2010 to the amount observed in 2002 (1314 people killed in 2002).
- 2 Create a basis for changing behaviour of road users, force people to realize the risks and responsibilities, not only for their lives but also for the lives of other road users.
- 3 Induce immediate responses to the campaign - raising interest, discussion, and keeping track of road safety issues (EFFIE, 2009).

The underlying idea of the campaign was that such a realistically displayed raw and unadorned stimulus will emotionally affect participants, thereby motivate the target group to reflect upon their own behaviour and responsibility as traffic participants. The campaign "Think or you'll pay!" "was priority directed to the reduction of serious accidents that resulted in death or serious injury. Some might argue that during the period the number of motor vehicles significantly increased and therefore it was logical that the number of accidents would also increase, because it was dependent on traffic. In the year 2000, 4.6 million units of motor vehicles were registered, and in the year 2015, it was 6.9 million. For credibility models we have worked in our research with the number of injuries per 100 thousand vehicles.

As Cuenen wrote, even though the basic format is always roughly the same, there are differences in terms of which populations are targeted as program participants and how such a testimonial is implemented (Cuenen et al., 2016).

Despite the worldwide massive marketing communication of broadcast spots and campaigns varied from Sweden's „Drink and drive"

campaign, British campaign called „Bad attitudes make bad drivers“, Norway's campaign „Being dead isn't cool" or Ireland's „Newer saw the day" campaign (Moan, Ulleberg, 2007; Stradling, Parker, 1996; Linderholm, 2000; O'Brien et al., 2002), the media campaign by Ministry of Transport "Think or you'll pay" has heretofore been considered as the very first campaign covering the Czech Republic comprehensively (Czech Association of Victims of Traffic Accidents, 2015).

The total campaign budget for the given period was amounted to EUR 6 000 000. The sum included the purchase of media space, production of television and radio spots, print production, and manufacture of traffic accident simulations, creating web and other online presentations and PR communication. The campaign can be seen not only on TV but also on radio, cinema and at the Internet promotion spots. An integral part of the campaign had also become a special installation of traffic accident simulations and flyers and leaflets were created, plus a wide portfolio of other information materials supporting the campaign. The main objective of the campaign was to contribute to a Europe-wide effort (Council meeting Transport, 2009) to reduce the number of road deaths by 2010 to the half of 2002. Another aim according to the EFFIE was to change the behaviour of drivers while driving (EFFIE, 2009).

#### 1.1.1. Target groups of campaign

The primary target group for the campaign "Think or you'll pay" were, in consistency with literature findings, drivers aged 18–60 years and families with children of up to 14 years of age. Detailed segmentation of the target groups and their percentage distributions were based on accident statistics. The most important target group (40%) were considered drivers of passenger cars in the range of 18-25 years, due to their lack of experience and immaturity and aggressive driving style (Braitman et al., 2008; Nemme, White, 2010; Curry et al., 2011; Durbin et al., 2014; Braitman, Kirley, Baym, 2015; Gauld et al., 2016; Mirman et al., 2017). Another target group were motorcyclists (20%) and their biggest problem on the roads was speed. The other target group were pedestrians as well as cyclists, and their visibility on the roads, children and the restraint systems, professional drivers and other drivers over the age of 25 years (10%) (Helbing et al., 2005; Haleem et al., 2015; Decker et al., 2016). The underestimated audience segmentation and exact message targeting are thought to be significant factors that may lead to the failure of mass media campaigns (Noar, 2006; Strecher et al., 2006). Promotion spots of the campaign were primarily focused on three main subject areas, namely speed and aggressive driving, drunken-driving and restraint systems which primarily means child seats and usage of safety belts.

#### 1.2. Communication strategy

The communication strategy illustrated the importance of understanding social and psychological background of the target audience, especially the behavioural motivations were rested on three pillars:

- 1 speed and aggression behind the wheel,
- 2 restraint systems,
- 3 alcohol and psychotropic substances behind the wheel (Crimmins and Callahan, 2003).

A common connecting element was an idea based on the principle of crime and punishment communicated through the slogan "Think or you'll pay". These targets and message were consistent with the result of Rosenbloom research, resulting in conviction that traffic security media campaigns must utilize their power for educational purposes by emphasizing the positive value of social control and that lawful behaviour should be presented as normative and therefore worthwhile (Rosenbloom, 2009).

Communication was conducted to demonstrate the real situation and intensified by the realistic representation of road traffic risks and

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