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NON-CAR ACCIDENTS AND TREATMENT IN PLASTIC SURGERY

Abstract. *The purpose of this paper is to analyze the impact of socio-demographic and latent behavioral factors on non-car accident risk, accidents which request surgical interventions in general and plastic surgery in particular. The contribution to risk is analized mainly using an econometric model.*

Keywords: *risk accidents, surgical interventions, regional distribution, logit model;*

JEL Classification: A12, C25, I19

Introduction

Plastic surgery interventions has recorded an important increase in recent decades both in developed and in developing countries. For example, in the U.S., the number of cosmetic procedures increased from only 0.4 million in 1992 to 14.6 million in 2012. There were also 1.6 million cosmetic surgical procedures, 13 million cosmetic minimally-invasive procedures, 5.6 million reconstructive procedures in 2012 in U.S. The expenditures of these procedures also increased from U.S. $ 927 million in 1992 to approximately $12 billion in 2007 according to American Society of Plastic Surgeons, (2012)

Plastic surgery is limited neither to the U.S. nor to developed countries: many developing countries like Brazil, South Africa, Turkey, South Korea and Taiwan performs cosmetic and plastic procedures.

Holliday, (2012) analyses the unusual high number of plastic surgery in South Korea for both women and men in the context of cultural influences. The authors show that the current positions presenting cosmetic surgery as pertinent only to female and non-western bodies misses important cultural influences. The

authors also show that the 'western body', as it is presented in some literature has little in common with actual western women's bodies, and more in common with a globalized image that embed elements from many different cultures.

In Fraser, (2003) the author stresses the idea that cosmetic surgery has a rich expression in the media and its impact on culture needs to be understood. This recognition inspires the two main questions examined in this book. The impact of cosmetic surgery, through its representation as much as through medical practices is also analyzed in this work. The most obvious gender observation made by the author regards the pronounced asymmetry in cosmetic surgery practice: the great majority of surgeons are male and the great majority of participants female.

Elliot, (2008) analyses the research conducted in Europe, America and Australasia regarding the cosmetic and plastic surgery showing the recent development in this field.

Pearl, (2003) investigates the most desired procedures in plastic and cosmetic surgery and found out that they were liposuction, rhinoplasty, and breast augmentation. The most widespread source of information about plastic surgery among the patients was teen magazines and television.

In Neligan, (2013) we can found an investigation about the psychological aspects of plastic surgery, medico-legal issues in plastic surgery, and patient safety in plastic surgery. The authors also presents some of the most used techniques in plastic surgery like tissue graft, tissue repair, repair, grafting, and engineering of cartilage, repair and grafting of peripheral nerve, techniques of microvascular surgery, transplantation in plastic surgery.

Soohyung, (2009) analyses the benefit of plastic surgery on the labor market and shows that this benefit is small compared to the surgery cost but with an exceptionally large improvement, the cost can be recouped in three years.

Gusenoff, (2008) investigates the temporal and demographic factors influencing the desire for plastic surgery showing that younger, divorced, female patients show the strongest interest in plastic surgery for body contouring.

The psychological outcomes of cosmetic surgical procedures is investigated in Nicki, (2013) showing that there is a high rate of post-operative satisfaction and significant improvements in several dimensions of body image and mental health, but not self-esteem.

Rosen, (2005) shows good the results obtained for three pilot cases of new applications for the use of the mirror in rehabilitation after hand surgery.

But plastic surgery is not a result of a person desire; plastic surgery is a must in many cases. Its benefit is sometimes non-valuable taking account the psychological impact of results on patient after life. Beside the breast augmentation or replacement forced by intervention after cancer disease, a great impact results after interventions needed after some home, leisure and work accidents.

Most frequent interventions after home, work or leisure dangerous accidents are related to: neck, surgeries, back surgeries, shoulder surgeries, broken bones, displaced fractures, orthopedic surgeries, hip or knee replacements, etc.

Usually these kinds of interventions need patient's hospitalization and or long term home-care. Effects of interventions have both psychological and economical negative effects:

-workdays lost, hospitalization cost and in some cases years lost with disability.

We try to analyze several factors which influence the risk of accidents in order to prevent, as much as possible,

Methodology and study

The analysis is made on a national representative sample formed by 18,172 respondents during the year of 2008. The sample is a part of the EHIS research carried out in Romania by National Institute of Romania.

The methodology of sampling, calibration is in compliance with the methodology proposed by EUROSTAT[1]. Due to the degree of regional sampling representation, the distributions of respondents follow population structure by main socio-demographic characteristics like gender, age-group, region of residence, etc.

A part of the cases from surgical cases are coming from different types of accidents which can be avoided.

An overview on the accidents is made by analyzing a variable which measure the status of having/not having an accident in the last 12 months. The status of not having any kind of accident is present at 99.5% of respondents, while 0.4% of respondents suffered in the last year an accident. An insignificant percent (0.1%) were refusals. The type of accident suffered by respondents is present in the figure 1.

The territorial distribution of respondents who have suffered a non-car accident is not uniformly distributed. There are several factors which contribute to this variability. Since main categories of non-car accidents imply work accidents and home and leisure accidents, one determinant of variability could be the regional economic development.

In the Figure 2, it can be observed the distribution of non-car accident in Romanian regions. Large values of share of accidents are characteristic to less developed regions like North-East (3.4%) or South-West region (1.6%). Pearson correlation coefficient estimated using share of accidents and regional household average income[2] is -0,51, statistically significant at level of 5%. Presence of higher frequency of accidents in less developed area may occur because of work/job type

[1] http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/documents/EHIS_wave_1_guidelines.pdf

[2] Source: National Institute of Statistics, Tempo online, Ancheta Bugetelor de Familie, 2008

distribution. In North East, South-West and South region the share of agriculture and some heavy industries, like mining or petroleum exploitation, domains with higher risk of work accidents may contribute to share variation.

Figure 1. Share of respondents by type of accidents suffered in the last year by the respondents

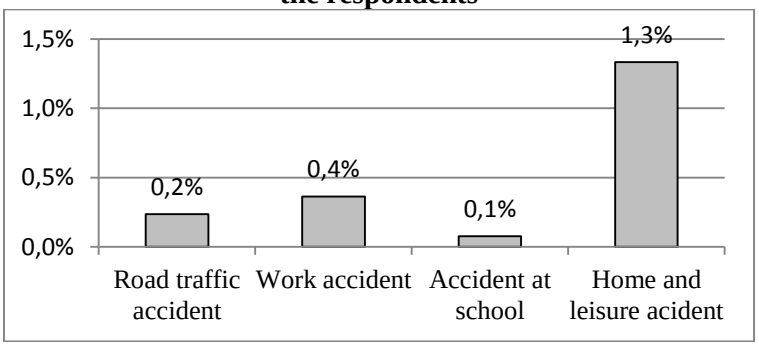
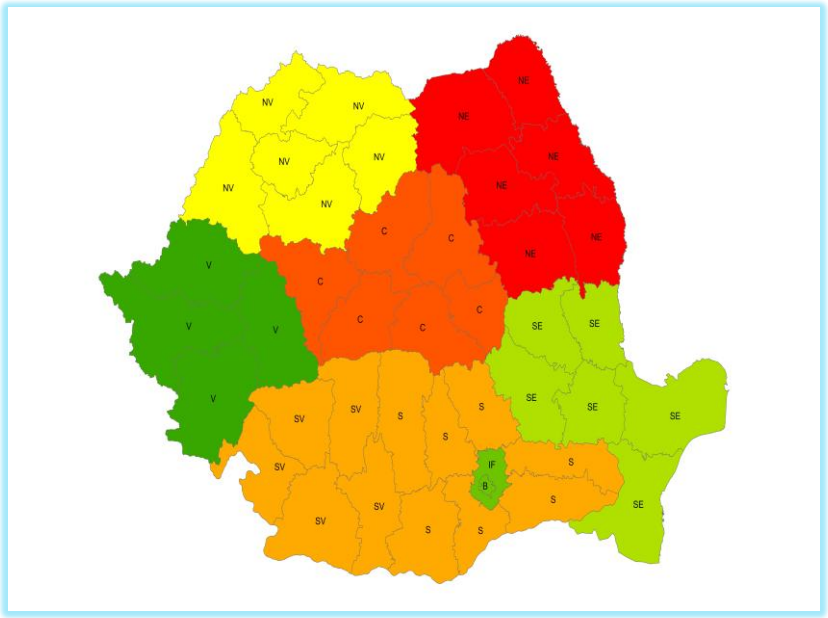


Figure 2.Regional share of respondents who suffered a non-car accident in the last 12 months



North-West **1.5%,** Center **1.8%**, North-East, **3.4%**, South-East **1.4%**, South **1.6%**, Bucharest-Ilfov, **0.9%,** South-West**1.6%,**West **0.6%**

The next step of the analysis is to see if some social and behavioral factors are increasing the risk of having accidents. The answer of this question is given by the results of the following logit model having as the dependent variable the status regarding the accidents suffered in the last year except the road and traffic accident. The variable is used in the model as ACC.

We consider the conditional average the proportion of respondents who suffered an accident in the last 12 months. In this case $=p_i*1 + (1-p_i)*0=p_i$, where x_i are the determinants of the result. Now we let be $p_i=f(X'b)$ and using logistic distribution we achieve the following relation:

——— where X= the vector of determinants

and

The following determinants are used in the model:

Socio-demographical covariates:

- *gender (*SEX*),* (1=males, 0=females)-
- *age*, (AGE), a continuous variable with values between 18 and 96 years old;
- *education*, (EDU) ordinal scaled with 7 levels where 1 =no formal education and 6= second stage of tertiary education
- *body mass index* (BMI) obtained by dividing the body mass by square height in meters.

Work-load and lifestyle covariates:

- *Home-exposure at risks* (HSHREXP) is measured on 3 point ordinal scale having code 1 for severely exposure and code 3 for non-exposure of noise, air pollution, etc.
- *Work-exposure at risks* (WKEXP) is measure on a 3 point ordinal scale with code 1 representing severe exposure and code 3 no exposure. Work exposure at risks measures if the respondents have to do difficult work

postures, work movements, handling of heavy loads due to the specific of work

- *Work-exposure at accident risks* (WKACC) measured also on a 3 point scale as the above mentioned variables;

Main Results

After maximum likelihood estimation the results presented in the next table are achieved.

Table 1. Risk factors and their statistical significance

Dependent variable=ACC		S.E.	Wald	df	Sig.	Exp( )
EDU	-.187	.100	3.455	1	.063	.830
BMI	.033	.023	1.990	1	.095	1.033
AGE	.014	.007	3.622	1	.057	1.014
SEX	.490	.194	6.374	1	.012	1.632
WKACC	-.256	.167	2.350	1	.125	.774
HSHREXP	.184	.145	1.607	1	.205	1.202
WKEXP	-.522	.164	10.079	1	.001	.593
Constant	-3.546	.898	15.592	1	.000	.029

Source: Own calculation based on Romanian EHIS database

Most of the estimated coefficients are statistically significant at levels below 5% (like Gender, work exposure at risk, etc) or 6% to 10% levels (like Age, education, body-mass index, etc.).

Overall econometric validation is made by Hosmer-Lemeshow goodness of fit test and Nagelkerke, Cox & Snell Pseudo R Squared statistics.

The economic and health validation is discussed in the next paragraphs:

The level of education is a significant factor in risk. More educated persons have lower risks of accidents. This thing is a result of two components: a) respondent knowledge and experience about risks determine him to a better avoidance of risk and b) type of occupation/job. Respondents more educated have type of jobs exposed to lower risks. Generally the model shows that for each level of education graduated, the risk of accidents decreases by 17%.

Body mass index (BMI) is also an important determinant of risks. Over heighted persons are more exposed of risks. For example, for one unit increase of BMI index, the risk of accident increases by 3%. This could be explained by the thing that over heighted persons are putting more pressure on their skeletal system and also by slowly movement in day by day activities.

Males are 60% more exposed to risk of accidents than females, mainly because of their work activity (heavy industry, agriculture, police, but also by their

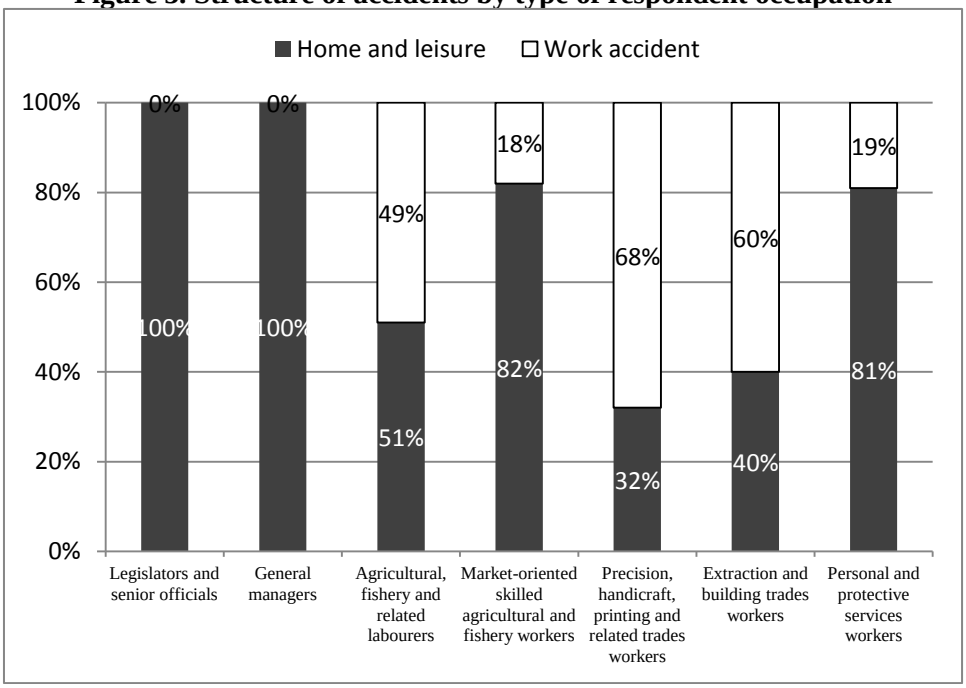
life style more risky like sports, car or motor-driving, skiing or climbing, etc). Also the model reveals that getting older by 10 years determines a risk increase by 14%.

Work accident exposure show that the decreasing degree of exposure determines a positive impact on decreases of general risk of accidents by 23%. Household exposure to general risk (smog, pollution, dust, grime, etc.) doesn't impact statistically significant the general risk of accident.

Perhaps one of the most important risk is type of occupation: Authors calculation reveals that people working as Legislators and senior officials, as general managers or as agricultural, fishery and related laborers, market-oriented skilled agricultural and fishery workers,precision, handicraft, printing and related trades workers, extraction and building trades workers,personal and protective services workers, etc[3] are exposed to higher risk of accidents.

A more detailed structure by type of accidents suffered by people working in each field with higher risks is revealed in the Figure 3.

Figure 3. Structure of accidents by type of respondent occupation



Legislators, senior officials and general managers, as expected, have suffered accidents only at home or at relaxation, recreation, probably in holidays. A special category of respondents is given by personal and protective service

[3]According OECD-ISCOM-88 Classification.

workers, a category where employees are high exposed to high risks by nature of work. On the contrary the employees suffered accidents mostly during their free time, and only 19% of them at work. Expected results were found in domain like agricultural, fishery, handicraft and building trades workers where a significant part of respondents suffered accidents at their workplace.

The severity of accidents.

As a result of an accident in most of the cases there is a need of seeing a doctor in emergency or in a scheduled meeting. In the case of accident at work, 53.1 % of persons are going to a form of medical care. In the case of school accidents 71% of persons visited a doctor or a nurse but none of the respondents went to an emergency department, meaning that all the cases of youngsters had not severe injuries or traumas. Accidents at home or leisure accidents needed in 61% of cases medical interventions.

Conclusions

It can also be underlined that non-work accident are statistically more frequent in thinly-populated area than in densely or intermediate areas, degree of urbanization being a factor correlated with other factors described above or included in the econometric model like occupation, age, education. Usually thinly-populated areas are more frequent in the rural area.

Acknowledgments

This paper was co-financed from the European Social Fund, through the Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/138907 "Excellence in scientific interdisciplinary research, doctoral and postdoctoral, in the economic, social and medical fields -EXCELIS", coordinator The Bucharest University of Economic Studies.

ii) This work was cofinanced from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/134197 „Performance and excellence in doctoral and postdoctoral research in Romanian economics science domain”.

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