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Potentially life-threatening vascular events (myocardial and cerebral infarction) - geographical distribution and temporal evolution in Romania

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Abstract

As worldwide, the non communicable diseases are a matter of concern in Romania, especially the cardio and cerebrovascular diseases that are the leading cause of death. The study of the geographical distribution and temporal evolution of these diseases could bring useful information for targeting cost-effective interventions that will avoid a great part of these deaths. The main objective of the study is to identify nationwide, regional and county-level the distribution of two types of life-threatening vascular diseases, myocardial and cerebral infarction and their temporal evolution. A cross-sectional study was conducted for period 2010-2014 by using validated hospital activity data reported at patient level by Romanian hospitals. The inclusion criteria considered all hospitals reporting data included in National Diagnosis Related Groups (DRG) database; data extraction targeted the selection of demographic and socioeconomic factors for DRG codes related to both health conditions. In the last 5 years the total number of potential life-threatening vascular events such as stroke and myocardial infarction increased, almost constantly the number of cerebrovascular events being several times higher than cardiovascular events. There are registred important differences among regions, the most affected being Bucharest area and several counties, both in myocardial and cerebral infarction. Men are almost twice affected by cardiac events, while in case of stroke there is a slight predominance for women in the last 2 years. Data indicates a constantly increasing predominance of patients residents in urban areas, the most affected being those over 65 and patients between 41-64 years of age. Further studies are required on the risk factors for these diseases in the most affected areas than targeted interventions should be designed and implemented in order to decrease morbidity and to prevent complications and loss of lives due to cardio and cerebrovascular diseases.

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Keywords: myocardial infarction, stroke, geographical distribution, time evolution, Romania

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1. Introduction

In a world of rapidly accelerating progress, non communicable diseases govern the model of morbidity and represent one of the most pressing public health concerns of the early millennium, affecting all countries and having a rapid growth. Non communicable diseases are the leading global causes of death. Their impact is particularly severe in low- and middle-income countries, more than 75% of cardiovascular deaths occur in these countries and 80% of all cardiovascular deaths are due to heart attacks and strokes [1], according to World Health Organization available data. A great part of these deaths could be avoided by well-understood, cost-effective and feasible interventions [2]. The leading causes of the non communicable diseases deaths in 2012 were cardiovascular diseases, with 17.5 million deaths, or 46% of all non communicable deaths. Of these deaths, an estimated 7.4 million were due to coronary heart disease and 6.7 million were due to stroke [3, 4]. Estimations showed that at global level by 2020 the ischemic heart disease will became one of the three leading causes of burden of disease [5], and the costs could rise by 22% by 2030 (from US$ 863 billion in 2010 to 1,044 billion in 2030) [6]. In response, in 2013, the 194 World Health Organisation Member States agreed on global mechanisms to reduce the avoidable non communicable burden including a "Global action plan for the prevention and control of non-communicable diseases 2013-2020" [7]. This plan aims to reduce the number of premature deaths from non communicable diseases by 25% by 2025 through nine voluntary global targets. Two of the global targets directly focus on preventing and controlling cardiovascular diseases.

In Romania, cardio and cerebrovascular diseases represents one of the most important public health issues, representing the leading cause of death (60% of all deaths). According to the *European Health for All Database* [8], the standardized death rate (SDR) for ischemic heart disease, all ages in Romania, in 2012 was 173.46 deaths per 100 000 population, which is more than double in comparison with the European Union (EU) average of 74.34 deaths per 100 000 population. The same is with the standardized death rate for cerebrovascular disease of 187.19 deaths per 100 000 population vs. 78.26 deaths per 100 000 population the EU average. Also, hospital discharge rate for cardiovascular diseases in 2012 in Romania (507.85/100 000) was more than twice the EU average (204.99/100 000). The first step in taking action towards the implementation of the WHO "Global action plan for the prevention and control of non communicable diseases 2013-2020" is to map and identify regional morbidity patterns, to investigate the causes and to implement disease prevention interventions. Therefore, the objective of this study was to investigate geographical patterns of the hospitalized morbidity by stroke and myocardial infarction, in Romania, given that there is not much evidence publicly available.

The objective of the study is to identify nationwide, regional and county-level the geographical distribution and the temporal evolution of two types of potentially life-threatening vascular diseases (myocardial and cerebral infarction).

2. Data and Metodology

A cross-sectional study was conducted to capture the scale of the potentially life-threatening vascular diseases phenomenon at national, regional, and local level. *The source of data* was represented by the National DRG (Diagnosis Related Groups) Database comprising hospital activity data reported at patient level, according to the Health Ministry's Order [9], no. 25/2012, approving the Validation Rules of the hospitalized cases under continuous hospitalization.

The inclusion criteria - all hospitals under contract with the National Health Insurance House and reporting monthly these data at the National School of Public Health, Management and Professional Development Bucharest were included in this study. *Data extraction* - the research used retrospective data for a period of five years range from 2010 to 2014. Data selection was made by using the SQL Server Management Studio Express 2005 software. There were considered the DRG codes corresponding to the two analysed health conditions: recent acute myocardial infarction (I21), respectively ischemic stroke (I63) meaning both thrombotic and embolic stroke. According to *Tabulated list of diseases, ICD-10-AM, Vol. 1 of international statistical classification of diseases and related health problems, overhaul 10 Australian modification (ICD-10-AM) Third Edition - July 1, 2002* [10], code I21 refers to acute myocardial infarction, including myocardial infarction specified as acute or with a term set for 4 weeks (28 days) or less from the onset, and I63 to cerebral and pre cerebral infarction, including brain artery stenosis and occlusion, resulting in cerebral infarction. Also there were considered sub codes for different localizations of acute