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RESEARCH REGARDING AVOIDABLE DEATHS IN ROMANIA WITH A VIEW TO ASSESS POPULATION HEALTH STATUS

- Summary of the PhD thesis-

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INTRODUCTION

Mortality, the phenomenon strongly dependent on the economic, cultural and social development, as well as the specific features of a society, cannot be analysed strictly biologically, also requiring a socio-economic and cultural analysis, which has paradoxical effects on health. The impact of this ubiquitous phenomenon is multidirectional, irrevocably interesting the individual himself, the carers/the relatives, the attending physician and the society as a whole, mainly due to the socio-economic factor. In light of the above, which reflect the significant impact of mortality, both at individual and micro and macro levels, I consider opportune to carefully analyse this phenomenon, especially its etiopathology, as well as the identification of some prophylactic means and some vulnerable population groups, with the aim to diminish its magnitude. Here comes the role of avoidable mortality, the subject of this study. Thus, the research falls within a category of great interest to public health, the avoidable mortality, namely avoidable deaths, a concept firstly used in 1970 by Rutstein in the US, as a way of quantifying the quality of the health system. Avoidable mortality is a real public health problem worldwide and, especially, at national level, insufficiently studied and quantified. The introduction of this concept and its use in research aims at comparing the performance of health systems and their international ranking according to the criteria established by the World Health Organization. By evaluating avoidable deaths/avoidable mortality, frequency and their causes, as well as by highlighting the profile of the victim of avoidable death, this research offers scientific support for elaborating a plan of action and specific prevention guidelines tailored to the needs of the population of Romania.

RESEARCH BACKGROUND – ANALYSIS OF THE CURRENT SITUATION

This part of research provides an insight into the most recent data available in the literature regarding overall mortality, respectively avoidable deaths and avoidable mortality in particular. The first three chapters provide information on: the determinants of population health status, indicators of general mortality, as well as conceptual delimitations and epidemiological data on these avoidable deaths and avoidable mortality within national and international context.

I have deepened and systematized the causes of avoidable deaths through the analysis of several lists of causes of avoidable deaths used in various studies. I have also introduced some elements

regarding the forensic approach of avoidable deaths, given that the forensic casuistry includes a large variety of causes of avoidable deaths. The epidemiological data was stratified according to the disease/condition that caused the avoidable death, creating an overall picture of the scale of this phenomenon globally, according to the determining cause. The information was summarized being collated in a coherent, easy to "digest" manner, so as to provide scientific support in delimitating and deepening the concept of avoidable death.

PERSONAL CONTRIBUTIONS

Research hypotheses

Assessing avoidable mortality as an accurate indicator of health and health system performances, by identifying and quantifying diseases amenable to primary and secondary prevention, leads to decreasing the number of deaths, which is a priority for public health worldwide, which is also found in the governing programmes of all countries and of the World Health Organization. Further research in this area contributes to the knowledge of the real situation of the demographic phenomenon of avoidable deaths, as well as Romania' position within the European/worldwide context. Thus, highlighting this phenomenon would enable the permanent update of the list of diseases causing avoidable deaths, tailored to the medical advances in the field of primary, secondary and tertiary prevention. The careful analysis of avoidable mortality/avoidable deaths, especially of their etiopathology, as well as identifying vulnerable population groups and some prophylaxis measures, contributes to assessing the significant mortality impact both at individual as well as at micro and macro levels. In fulfilling these goals, an important part is played by the careful "dissection" of the forensic casuistry, which includes a vast pathology, enabling a thorough analysis of conditions leading to avoidable deaths and the identification of the profile of the victim of the avoidable death. The involvement of the physician, as a key person within the multidisciplinary team assessing the studied demographic phenomenon, establishing new responsibilities, as well as a comprehensive regulation of his role in the investigation and quantification of avoidable deaths, allows the elaboration of prevention guidelines tailored to the needs of the society.

Aim of the research

Improving the health of the population and achieving maximum standards in terms of the wellbeing of the population by reducing the rate of avoidable mortality, requires the identification of the disorders amenable to the means of prevention, which cause avoidable

deaths, quantifying and ranking them in order to diminish the phenomenon, as well as the adoption of early and effective prevention guidelines. Achieving these goals would mean a higher quality of the health care system, both in terms of primary prevention, secondary and tertiary prevention with an important echo at micro and macro level. The idea previously exposed represented the starting point of the research, which was continued with the detailed study of the literature, identifying certain features insufficiently investigated.

Study methodology

Presentation of personal contributions complies with the structure of the complex traditional research, being made up of four distinct chapters interconnected through the causality of the highlighted conclusions. Research methods used in this thesis are quantitative and qualitative, specific to each stage of research.

STUDY I – Clinical and epidemiological assessment of the dynamics and causes of avoidable deaths at national level

Aim and objectives: The study aims at a dynamic clinical and epidemiological approach of avoidable deaths in Romania, in terms of the main determining causes with a view to facilitate the structural and functional integration of the phenomenon recorded in studies monitoring the multisectoral consequences of avoidable deaths nationwide.

Materials and methods: I conducted a descriptive study, which consisted of an observational, retrospective study on the statistical data on deaths and mortality found in the databases of the National Institute of Statistics and the National Institute of Public Health, and in the annual activity reports of the County Public Health Directorates and Health Statistics Yearbook of the National Center for Public Health Statistics and Informatics. I fully researched the study material between 2006 and 2013.

Results and discussions: Analysis of avoidable deaths in Romania between 2006 and 2013 identified a percentage of 15% deaths of all avoidable deaths. Over the study period, the trend of avoidable deaths has been slowly descending, recording a decrease thereof by 2% in the last year included in the study compared to the first. Less than half of avoidable deaths in Romania, in the period 2006-2013, were due to treatable disease (amenable to secondary prevention), and over half of them (58%) were due to preventable diseases (amenable to primary prevention).

About two-thirds of registered avoidable deaths (66%) were recorded in men, and of these two-thirds were classified as avoidable deaths caused by a preventable disease (66.34%). In women, the situation was different, less than half of them had as cause of avoidable death, a preventable disease (41.54%).

Based on a careful analysis of statistical data I compiled the list of diseases/disorders that are common causes of avoidable deaths in Romania, listed in descending order of frequency: ischemic heart disease; hypertension and cerebrovascular diseases; cancer of the trachea, bronchi and lungs; breast cancer; endometrial and cervical cancer; cirrhosis, infant mortality, accidents caused by motor vehicles; tuberculosis.

Comparative analysis of the dynamics of avoidable deaths recorded in 2013 compared to those recorded in 2006, according to the most common causes of death, has detected decreases in avoidable deaths according to most diseases in both genders, except for cancer of the trachea, bronchi and lung and breast cancer in men.

Conclusions: Almost a fifth of avoidable deaths in Romania (15%) from 2006-2013, recorded in people aged under 65 could have been avoided through early and effective primary and secondary prevention, falling into the category of avoidable deaths. The only 2% drop in avoidable deaths in 2013 compared to 2006 is alarming, demonstrating the critical need to improve the health system.

Avoidable deaths from Romania aim mostly at men and are more often caused by diseases amenable to primary prevention. The main causes of avoidable deaths identified in this study are also found at European level (ischemic heart diseases, hypertension and cerebrovascular diseases, cancer of the trachea, bronchus and lung, breast cancer, endometrial and cervical cancer). In addition, the study also revealed high frequencies in Romania for avoidable deaths due to other conditions than those recorded at European level, such as: tuberculosis, liver cirrhosis, infant mortality, accidents due to motor vehicles.

The results demonstrate the need for preventive methods and guidelines that aim at both preventable diseases and treatable diseases causing avoidable deaths in Romania in order to decrease their number, as well as the need to improve the performance of health care system in our country.

STUDY II - Analysis of avoidable deaths / avoidable mortality by cause of death at regional level

Aim and objectives: This study aimed at evaluating the intensity of avoidable death phenomenon at regional level according to the main causes of avoidable death in Romania,

which were highlighted in the first study. Among the objectives of the study, the following can be mentioned: assessing the size and clinical and epidemiological characteristics of avoidable deaths at local level, establishing the vulnerable areas and their hierarchy in relation to the avoidable death, as well as highlighting the dynamics at regional level.

Materials and methods: I conducted a retrospective, observational, epidemiological, descriptive study. The study material consisted of statistical data collected from the databases mentioned in the first study, as well as data found on the website of the "Mina Minovici" National Institute of Forensic Medicine Bucharest. The period under study was 5 years (2009-2013).

Results and discussions: The research conducted in Romania highlighted that the region with the most increased mortality rate of avoidable death was South Oltenia (176.36 avoidable deaths per 100.000 inhabitants), while the region with the lowest rate of avoidable mortality is North East (138 avoidable deaths per 100.000 inhabitants). In all Romanian regions, the number of avoidable deaths is declining, following the trend demonstrated at national and international level, but at a reduced scale of these decreases, the percentage values to reduce the number of avoidable deaths from 2013 to that of 2009 being different from a region to another (between 6.10% and 11.51%). In South Oltenia, there were recorded the highest rates of avoidable deaths due to cerebrovascular disease and hypertension, cirrhosis and tuberculosis. The rate of avoidable mortality due to cerebrovascular disease and hypertension in South Oltenia region was the highest in Romania (regardless of the cause that led to avoidable death), being of 61.86 deaths per 100.000 inhabitants. The regional distribution of neoplasms which are common causes of avoidable death in Romania (cancer of the trachea, bronchi and lungs, breast cancer, endometrial and cervical cancer) showed the highest rates of this type of avoidable death in Bucharest in the West region. The most significant reductions in avoidable deaths recorded in 2013 compared to those recorded in 2009 were of 44% for avoidable deaths due to infant mortality (Central region), of 35% for those caused by tuberculosis (Central region), respectively, of 24% for those caused by endometrial and cervical cancer (the West region).

Conclusions: The analysis of the distribution and frequency of avoidable deaths at territorial level, according to the development region showed particular circumstances and vulnerabilities regarding the root cause of these deaths. I identified some significant differences in mortality rates recorded at regional level for avoidable deaths due to myocardial ischemia, for those due to cerebrovascular diseases and hypertension, as well as for those due to tuberculosis. For other diseases that cause avoidable deaths, the differences between regions were not equally important. We also pointed out that, contrary to the general decrease in avoidable deaths, those caused by cancer of the trachea, bronchi and lungs, and those caused by breast cancer showed an upward

trend between 2009 and 2013.

The regional variations in avoidable deaths/avoidable mortality are evidence of the local/regional influences on this phenomenon, but also of the possibilities to improve this indicator of population health at regional level.

STUDY III – Clinical, epidemiological and mesological characteristics of avoidable deaths in the forensic casuistry of Sibiu County

Aim and objectives: The aim of this study was to identify the avoidable deaths in forensic casuistry of Sibiu County and the clinical, epidemiological and mesological characteristics thereof, with a thorough analysis of those caused by cardiovascular disease.

Materials and methods: I conducted a descriptive, analytical observational, ambispective study, on all documents relating to the deaths in the casuistry of Forensic Medicine Service of Sibiu County and Foresnic Office of Mediaş, from January 2006 - December 2015. Given the density of information on study results I decided to split it into two underlying studies: *study III.1*. - examines all avoidable deaths in the forensic casuistry of Sibiu County for a period of 10 years, between 2006 and 2015; *study III.2.* - refers to avoidable deaths due to cardiovascular diseases taken from the forensic casuistry of Sibiu County, from 2006 to 2015.

Results and discussions: The forensic casuistry of Sibiu identified 1178 avoidable deaths within 10 years, representing 40% of all forensic autopsies. In dynamics, their share of all forensic deaths increases up to 6% (in 2006, 37% of these forensic deaths fell into the category of avoidable deaths, and in 2015, 43%). I found a much higher frequency of avoidable deaths in men (sex ratio men: women being of 3.7:1) and in people from urban areas (56%), as well as an increase in the average age of victims of avoidable deaths by about 5 years during the decade studied. The deaths included in the study occurred most frequently in autumn and spring, in other place than at home or in a medical facility. Cardiovascular diseases caused around half of all avoidable deaths with forensic consequences (about 49%), and another 40% of them were due to traffic accidents, the prerogative of the forensic medicine. Acute myocardial ischemia caused more than half of avoidable deaths due to cardiovascular diseases (57.51%); other diseases commonly incriminated were dilated cardiomyopathy and stroke (18.53%, respectively, 8.91%).

The year 2015 recorded an increase in the share of avoidable deaths due to cardiovascular diseases in the forensic casuistry of Sibiu County, by about 13% (from 43% to 57%). Almost half of avoidable deaths caused by cardiovascular disease have occurred in the age group 50-59 years (47%). Avoidable deaths due to cardiovascular diseases occur most frequently in summer

(about 35%) and at home (52%).

Conclusions: Forensic casuistry represents an important and varied source of avoidable deaths (almost half of the forensic autopsies during a period of 10 years addressing an avoidable death). This analysis confirmed the international data and the data drawn from the first two research studies on the increased frequency of avoidable deaths due to cardiovascular diseases and within these ones, of those caused by acute myocardial ischemia. In addition, there were also identified the avoidable deaths from cirrhosis, pulmonary tuberculosis, lung, gastric/duodenal ulcer cancer, pneumonia and the therapeutic accident (one case in those ten years analyzed).

This study found that most of the victims of avoidable deaths from cardiovascular diseases with forensic consequences had the following characteristics: Romanian nationality, orthodox, unmarried or divorced, graduates of vocational schools, no occupation. Applying statistical correction in terms of nationality, religion and education level of the deceased, depending on the population structure of Sibiu County changes the above-mentioned distributions.

STUDY IV - Profile of the victim of avoidable death due to cardiovascular disease with forensic implications

Aim and objectives: The aim of this study is to determine the profile of the victim of avoidable death from cardiovascular diseases with forensic implications from socio-professional and economic point of view and to appreciate the accessibility and addressability of victims of these types of deaths to healthcare services.

Materials and methods: Work methodology consisted of conducting a medico-social inquiry. In the first stage, I performed a prospective descriptive observational study, during 2014-2015, over 141 cases of avoidable deaths from cardiovascular diseases with forensic implications in the forensic casuistry of Sibiu County. In the second stage, I used as a research tool the questionnaire specially designed based on the questionnaire used in the United States of America by the Centers for Diseases Control and Prevention (CDC), which was administered to the carers of the deceased who had an avoidable death due to cardiovascular cause. I managed to obtain 115 questionnaires filled out in the period February 2014 - December 2015. The role of administering the questionnaire was to highlight information on: socio-economic and professional level (income, housing conditions, education level, occupation etc.); eating toxic substances (alcohol, tobacco, drugs); herodo-collateral antecedents; previous medical history (chronic diseases, hospitalizations, medical treatment recommendations, therapeutic adherence etc.); addressing and accessibility to health services, etc. Filling out the questionnaire was assisted, taking the

form of a dialogue, which facilitated the "work" of the caregivers.

I mention that the study complied with the research specific ethical and professional norms; so I administered to each respondent a consent form to participate in the study and I have observed the principle of confidentiality of information obtained.

Results and discussions: The value of the information obtained through the questionnaire administered is demonstrated, on the one hand by the high percentage of cases (about 82%) in whom I have received positive feedback from carers, and on the other hand, by the heterogeneity of the analyzed group, without applying exclusion criteria. Thus, the composition of the group observes the scale derived from the third study of this research in terms of representation of certain categories, such as gender, origin, age, place and date of death, nationality, religion, educational level, economic activity, marital status and the cardiovascular disease that led to death. *With regard to social factors,* this study shows that the victims of avoidable deaths frequently fall into the category of people with the following characteristics: anomic marital status (54.78%); with no children or adult children (75.65%); socially assisted or with incomes below the minimum wage (56.52%); no personal dwelling (57.42%); poor living conditions, modest at the most (74.78%); no occupation (39.13%) or with a job that involves either great physical effort or increased psychological stress, or toxic environment (50.43%); chronic use of toxic substances (alcohol and smoking, 90.47%). The profile of the victim of avoidable death from cardiovascular diseases established based on the analysis of *biological and medical factors* resulting from the questionnaire, is outlined as follows: most of the victims were known with a family history or personal history of cardiovascular disease (65.22%, respectively 71.30%) with the recommendation for chronic drug treatment for this pathology (71.30%), but less than half of them have proven therapeutic compliance (56.09%); a quarter of those included in the group (25.61%) had at least one hospitalization for cardiovascular diseases; a significant percentage of the studied cases were not on the list of any family physician (at least 13.04%), while in more than half of the cases, the frequency of check-ups to the family doctor was very low, a check-up every 1-3 years or even rarer, every 1-5 years (totalling 61.72%).

Conclusions: Summarizing all information obtained about the life of the deceased has allowed to "portrait" this one, including socioeconomic status, health history and even data on the psychological profile, accurately determining the conditions under which death occurred and thus, establishing the "role" played by the deceased in causing or "speeding up" his death. This study shows that, often, avoidable deaths are due to or favoured by social factors, lack of education, lack of interest in their own health, irresponsibility, criteria that are rather individual and are not related to the performance or short-comings of the health system. Knowing the

profile of the victim of the avoidable death, by both health professionals and the "common man", is the first step in establishing effective health policies, targeted on the actual needs of the population, and in reducing the exposure to cardiovascular risk factors.

GENERAL CONCLUSIONS

This research represents ***a holistic and dynamic analysis of avoidable deaths in our country, nationally and regionally.*** The opportunity for such a study derives from the lack of national statistics, and even less, of regional statistics on avoidable deaths, but also from the role of the concept of avoidable death as an indicator of population health. Thus, this research is intended to be an original pilot study to substantiate research methodology issues on avoidable deaths/avoidable mortality in Romania in order to assess the magnitude of the phenomenon and to develop an updated list of diseases/disorders that cause avoidable deaths.

The interdisciplinary and multicentric character of the research, the study of avoidable deaths at territorial level, the forensic approach of avoidable deaths, the questionnaire applied to caregivers of the deceased are some of the original elements of the thesis, which give it the expected value.

Through the multisectoral assessment of the scale and dynamics of avoidable deaths in our country, this research enables making considerations on the performances of the health system, providing a comprehensive and real picture. Following the processing of the questionnaires, one can say that the high number of avoidable deaths registered in our country is not only due to the failure of the health care system, but also to the beneficiary of such care, in this case to citizens, through poor medical education, but also through the carelessness for their own health. On the other hand, this study provides an accurate assessment of the need for guidelines and protocols for primary, secondary and tertiary prevention, forming a foundation for effective identification and monitoring of risk groups with different allocation of resources per priority areas of intervention. And, the study allows predictions on the dynamics of these types of deaths and therefore, on the dynamics of human resources in Romania.

In conclusion, the beneficiaries of such a study are heterogeneous: the patient, citizen of Romania - through its quality of beneficiary of health care services; the physician - through the quality of health services provider, and therefore, of the development and implementation of preventive means; the state institutions - by providing relevant statistical and real data on vulnerable populations and the risk factors of avoidable deaths.

Research limits are determined by both objective and subjective factors, such as: the actual share

of avoidable deaths in Sibiu County, according to their definition, is higher than that identified in the forensic casuistry due to the fact that some avoidable deaths for which the family doctor has issued Certificate of the Fact of Death have no longer been submitted to necropsy, respectively, some avoidable deaths belonged to the anatomopathological casuistry, so they were not included in the study group; the list of the causes of avoidable deaths is valid and topical for the time of the research, but it may vary due to early efficiency programmes or due to the occurrence of new therapeutic means; the subjectivism of the respondents to the questionnaire, the lack of motivation and of accurate data reduce the value of the information obtained, and hence of the results; conducting such a study in each county in Romania is difficult, requiring the involvement and support of all state institutions with responsibilities in healthcare and not only.