Statistics of Accidents in the Portuguese Elderly Population: A Short Review

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ABSTRACT

This short review of accident statistics emerged from the need to characterize the loss ratio of the Portuguese population aged 65 or older (one-fifth of the resident population), as part of a larger ongoing study on national policies of risk management. Step three of five consisted of researching information on accident statistics within public organizations, within academic studies university programs and in full-papers. The statistical information obtained mainly reflects work accidents and does not include many of the other occupational activities of the elderly. The available information does not present data that support the characterization of the injured person, such as age. The elderly present individual conditions that characterize them as a vulnerable group when exposed to risk, with reflections in the accident rates. Considering the importance of human factors and the age of the injured person in the cause of the accidents, it seems appropriate and essential to specify the age of groups (65 or more years) in the accidents data, to respond to the information needs, to facilitate detection of changes in the level of occupational risk and products, as well as support the need for legislation and standardization of risk management issues in the activities of the Portuguese elderly population.

Keywords: Elderly, Aging, Accidents Statistics, Age Group.

INTRODUCTION

The term aging is increasingly used in individual conversations, in public debates and in statistical analyses, in a search for solutions for modern society. When people talk about aging, one can have distinct approaches: individual aging, age-related, centred on the chronological and on the bio-psychological aspects, or collective aging, including ageing populations and societal ageing or society (Rosa, 2012). According to UN data, it is estimated that by 2050 the average age of the population can reach 38 years around the world and 47 in Europe. In Portugal, the evolution in recent years has been even sharper than in Europe: in 1950, the average age of the population was 26 years, in 2010, 41 years, and possibly reaching 50 years by 2050.

It is expected that this number will continue to increase when considering persons in active age, doubling by 2060. This situation poses a challenge, but also an opportunity to use the skills and capacities of older people.

According to data from the National Institute of Statistics (INE, 2013), people 65 or older, the elderly according to the WHO classification, are more than two million in Portugal and represent 18% of the total 10.5 million residents, according to the latest national census (INE, 2011). Another meaningful piece data within the context of this analysis is that the elderly 75 years or older are nearly one million people, 9.4% of the population. With regard to employment and the labour market, individuals in the 65 or older age group represent: 6.1% of total employees working in the three sectors of economic activity, 5.3% of the active population, and 33% inactive individuals.

The concept of "active aging" has evolved and there is now a more comprehensive and multidimensional perspective, geared toward optimizing opportunities for health, participation and social security, mainly because of the operational necessity of results and for the setting standards of success.

"Aging" now appears associated with the terms quality of life and elderly health, while maintaining physical, psychological and social autonomy, and where the elderly are integrated into safe societies in which they can assume full citizenship. As for the concept of "active", is not only linked to the ability to be physically active or to be part of the labour force, but also implies an individual involvement and participation in the various social, cultural, economic, civil and spiritual forums (Ribeiro & Paúl, 2008).

This new understanding and outlook on aging emphasizes the importance of people to realize their potential to promote their well-being and, above all, their quality of life during the course of their life and not a just at a specific moment (Ribeiro & Paúl .2008, pp. 2-11).

During daily contacts among family members and friends within this age group, as well as throughout the implementation of the data collection tools (surveys, interviews and observational visits to institutions and homes), it is easily verified that the elderly have different ways of getting older. This is a heterogeneous process and, according to WHO, it is greatly influenced by the determinant factors of active aging (Fig. 1).
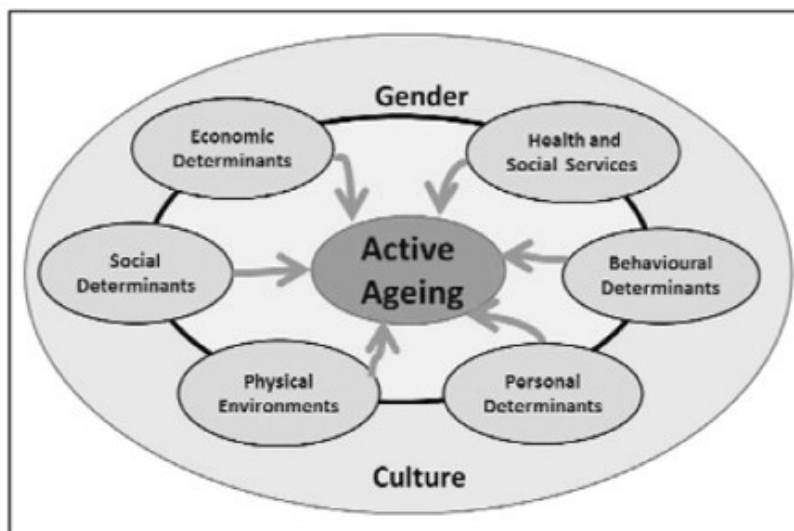

Figure 1 - The determinants of active ageing (Source: Adapted from WHO, 2007)

Therefore, individual aging depends on each person's individual responsibility and personal factors (genetic, behavioral, past experience, training, lifestyle), as well as on the surrounding environmental conditions (economic, social, cultural and physical).

Knowledge of the dangers and finding ways to control the risks associated with those dangers has led to the development of empirical knowledge. Subsequently, scientific knowledge was advanced, substantiated by the use of work and daily-life organizational techniques, by the development of measures of protection, and by the procurement of safer materials, based on practical applications of the acquired knowledge, all guided toward preserving human resources and materials. These are important stages that have characterized human evolution.

Individual and collective survival is a human trait. When humans receive an environmental stimulus to act, there is an immediate psychophysiological readiness of the system (response) that mobilizes the energy of the body and adjusts the level of physiological parameters. The injection of large amounts of adrenaline into the bloodstream inhibits digestion, speeds up heart activity, and causes an awakening of the sense organs. This joint action prepares the body to face a challenge or to avoid dangerous situations (Iida, 2005, p. 380).

Risk management, which includes risk analysis, risk assessment, and risk control, focuses on proposing measures for prevention and protection within the different activities (Fig.2).
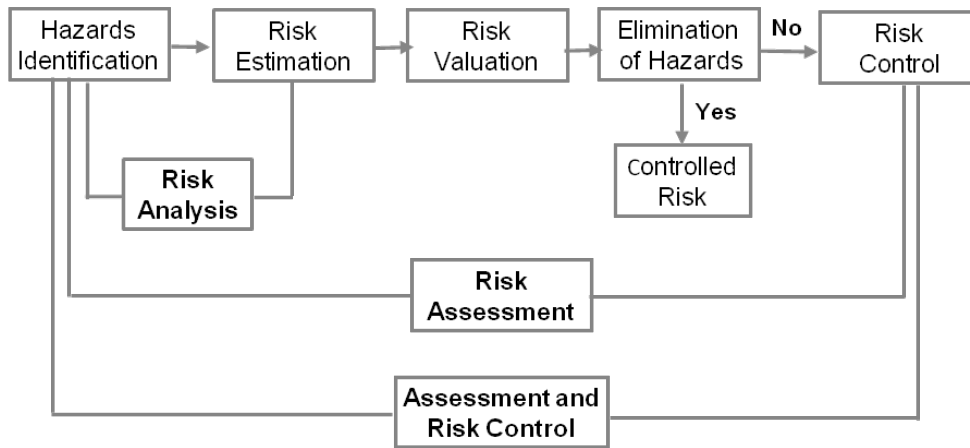

Figure 2 - NTP 330: Simplified system of evaluation of risk of accident (Source: Spain National institute of OSH)

The accurate analysis of demographic, individual, and collective aging, as well as of the respective confirmation indicators, can provide an understanding of the size of the sample population found within this age group, and for whom policies and actions must be adopted in order to appropriately manage its health and safety.

In risk assessment, a fundamental phase of accident risk management, different aspects are weighted and placed at each corner of a triangle (Fig. 3). The first corner is related to organizational aspects, processes and procedures that characterize the development of each activity with the various tasks; the second corner reflects analyses of the technical and technological elements, including machines, tools and utensils, materials and products that are used, as well as of the physical environment where each task is accomplished; the last corner corresponds to intrinsic and extrinsic human factors.
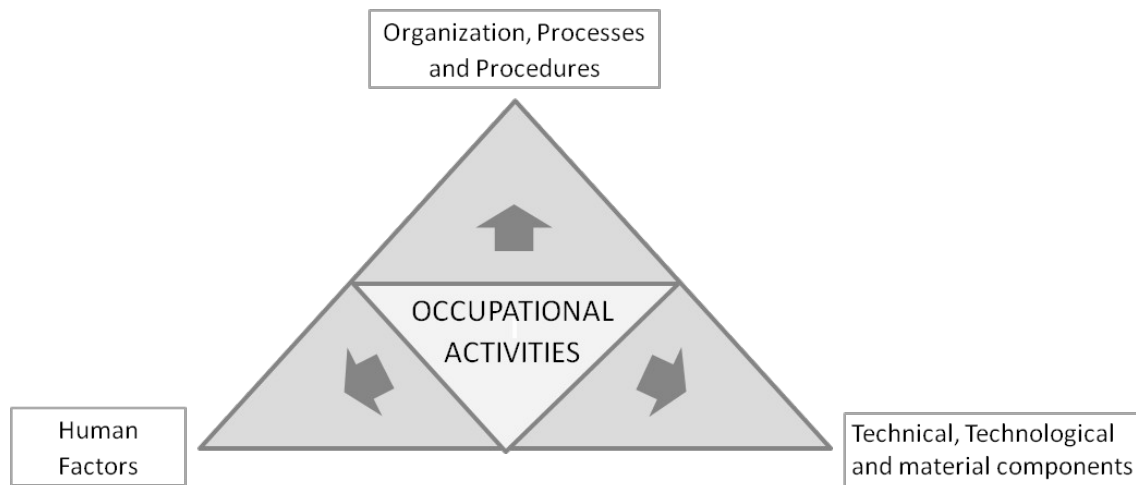

Figure 3 – Elements that characterize the places and occupational tasks (Source: FAP, 2013)

Within the context of this review, occupational accident is any unexpected and unforeseen event, including acts of violence, stemming from or related to work, or events that occur during the development daily life activities, and that leads to personal or psychological injury of one or more persons (65 or older).

On-the-job accident is an occurrence reflecting a particularly serious situation in terms of safety and health in the workplace, involving injury with more than three days of work absence, or inability to fully ensure normal work tasks during that period of time (Law No. 102/2009 of 10 September and Decree Law No. 102/2000 of 02 June). On-the-job accidents also include travel, transport or circulation accidents in which workers are injured, and that

occur due to, or during, the course of work, i.e., when engaged in an economic activity, work or otherwise performing tasks for an employer.

For the same statistical purposes, accidents outside the scope of the work are considered to be all those that occur during domestic and leisure activities (DLA), recorded by the emergency rooms of the National Healthcare System, through the application of the digital modular system of Domestic and Leisure Accidents Information (ADELIA), and where the cause is not illness, traffic accident, work accident or violence. Occurrences on public highways, or involving at least one moving vehicle, with knowledge of the appropriate authorities (National Republican Guard-GNR, National Republican Guard / Traffic Brigade-GNR/BT, and Public Safety Police-PSP) and which result in property damage, and/ or victims within this age group, fall within the scope of road accidents and are recorded by the National Road Safety Authority (ANSR).

ANALYSIS OF STATISTICAL RECORDS OF ACCIDENTS AS A SUPPORT TOOL FOR RISK MANAGEMENT SYSTEMS

Given the current reality, specifically, the demographic evolution and status of active ageing policies, as well as accident prevention of the elderly, a national project is currently being developed that seeks systematic responses designed to improve accident risk management within the activities of the Portuguese elderly, and within the context of active ageing. In order to achieve this objective, questions and issues were defined, and a multi-disciplinary scientific team investigated possible responses.

Goals of the project:

• Understand how the different components of daily activities (work, home, socialization, physical activities and recreation), can influence the probability of accident occurrence and potential consequences, as a result of exposure to hazards;

• Learn to identify potential hazards, risk factors and risks present in the occupational environment;

• Gain insight into control actions and understand the proposed measures of preventive and protection that eliminate dangers (desirable) and /or control existing risks (act instead of react).

During the development of their daily tasks, the elderly are faced with occupational conditions that are not adapted to their characteristics and abilities. This project seeks to answer the following key questions, from the point of view of the elderly:

• What are the occupational hazards in my workplace, at home and in public spaces that I use?

• Is the risk level ascertained in each different situation and task strongly influenced by the fact that I, an elderly person, and carrying them out?

• Will the type of occupational hazard affect me differently, with increasing age?

• How can I act to eliminate these hazards or, if impossible, protect myself from their possible consequences?

It became necessary to characterize the accidents occurring within the Portuguese population aged 65 years or older, since this is essential information for risk assessment, and for the development systems and processes associated with risk management in occupational activities involving this age group.

Therefore, the project analyses risks within three fundamental groups of activities in which this age group participates: (i) professional- including all three economic sectors; (ii) societal - actions involving participation in society; and (iii) daily life activity - the set of daily life tasks, indicators of individual independence and autonomy (employees, active and inactive) (Fig. 4).
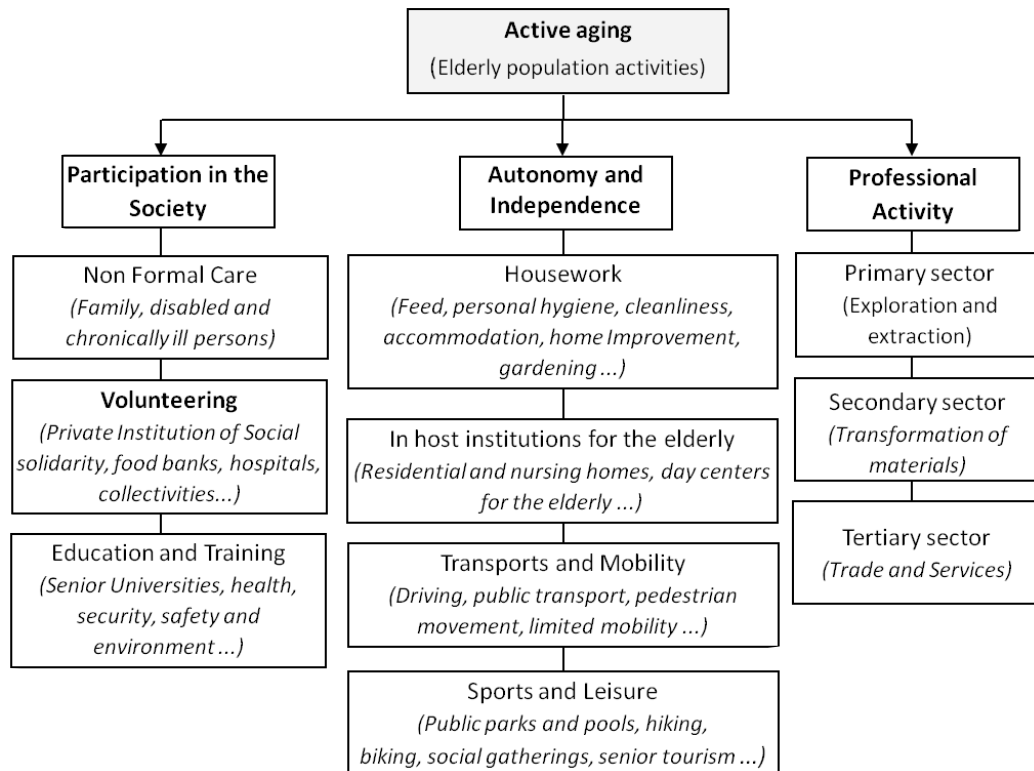
Figure 4 – Main activities carried out by the elderly population

The biology of aging (Characteristics of the population with 65 or more years)

According to the WHO, the senior citizen is a person over 65 years of age, regardless of the sex or health status. However, from the perspective of active ageing, this concept of "elderly" doesn't make much sense.

Several attributes, such as wisdom, strategic thinking, holistic perception and decision-making ability, either increase or appear with the advancement of age. Professional experience and expertise also accumulate with age. Moreover, there is also evidence that cognitive performance does not, in general, have any sharp decline before the age of 70.

Changes in age-related functional skills are not uniform, due to:

• Specific differences in lifestyle, nutrition, and physical condition;

• Genetic predisposition for the disease;

• Educational level (training and information);

• Professional record, work environments and others.

In the later stages of life, health is also influenced by the lifestyle led in youth. Decrease functional skills can be delayed and minimized through healthy living habits, such as:

• Practicing regular physical exercise, healthy diet and nutrition, low alcohol consumption, smoking cessation, rest and sleep (promotion of health in the workplace);

• Workplaces that promote healthy lifestyles, with support activities that delay the decline of functional skills, thereby contributing to the maintenance of working capacity: comfort, safety and well-being, geared toward productivity.

Alone, aging is not a determining factor for decreased capability, however it interacts with all these factors which, taken together, do indeed affect functional skills. Skill changes occur with respect to the individuals and not to age groups, which means that there are considerable differences between individuals.

Some functional skills, primarily physical and sensory, decrease as a result of the natural process of aging. During risk assessment, potential changes in functional capabilities must be taken into account. Work and work environment must be modified in order to appropriately respond to these changes and personal needs (IV general principle of prevention – adaptation of the task to the worker, Fig. 5)
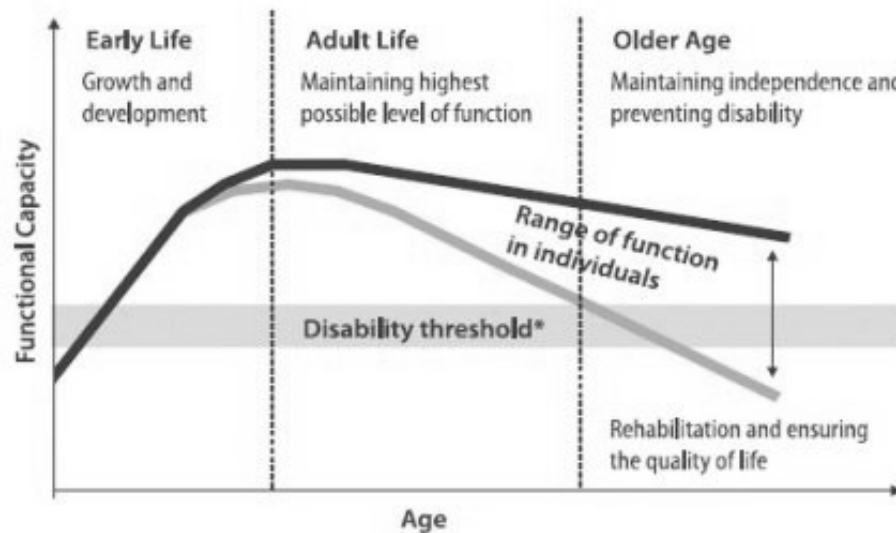

Figure 5 - Maintaining functional capacity throughout the life (Source: Kalache & Kickbusch, 1997)

Many of the changes in age-related functional skills are more of an issue in some occupational activities than in others, such as, for example, those that require:

• Balance and quick reaction to stimuli, because work is performed under extreme conditions, such as security and defence forces, firemen and evacuation personnel who use heavy equipment to lift and transport people;

• Ability to evaluate distance and speed of moving objects, with repercussions on night driving or on crane operation, but that does not affect office or administrative services workers.

Ageing is associated with some concerns at the level of accident risk management, which should be prevented given the evolution of human characteristics (human factors), both intrinsic and extrinsic, throughout each individual's lifetime.

Thus, at the design, implementation and maintenance stages of the locations where professional and occupational activities are to be held daily, evolution of the characteristics of the elderly must be considered and recognized that the aging process is personal and not uniform, as described above.

Requirements

In accordance with parameters recommended by the ILO, the analysis of the statistics on accidents at work must

facilitate the clarification of the magnitude of accidents during a given time period. To achieve this, claim indicators related to parameters of recorded accident incidence and severity are analysed. These help to understand the situation at all times and to study the trend of developments during the period under review, as well as, to substantiate correction and improvement actions.

Frequency rates are closely related to the probability of an accident occurring due to exposure, hence the importance of having information on the various types of occurrences. They contribute to the value of the probability variable, the organization, the occupational processes and procedures (type and sequences of tasks and products used), the workload which is the outcome of the duties/ tasks, timetables and pauses, the task execution frequency or time of exposure to risk, the adequacy of the materials used, the controls implemented and the compliance status of the sites.

Gravity rate allows insight into the level of damage severity of accidents, it translates the effective impact of accidents on the company's productivity (for those who still work), or the inability of the elderly to develop the autonomy in their daily life activities allowing them to be independent. This parameter is closely tied to the type of consequences felt by the victims, and crucially depends on the individual and collective protective measures adopted both by the employer and by the individual to reduce the consequences of risk exposure.

Based on the available statistical data, this study investigates the type, frequency and severity of accidents among the elderly. The goal is to determine accident trend, a key element to understand the magnitude of the problem and to define interventions that are more directed to this age group (target populations), through an appropriate risk assessment and development of management systems of occupational safety and hygiene within the various occupational activities (work, home, leisure and participation in society).

Materials and Methods

Data collection for analysis focused on gathering information characterizing the elderly population in Portugal within the following aspects:

• Effective elderly, geographical distribution, before the employment situation and type of other activities developed (work, home, leisure and participation in society);

• Date of birth, gender and training of the target population – autonomous and functional elderly;

• Characterization of accident: date, time, place, activity at the time of the occurrence, mechanism of injury, type of injury, part of body injured, description of the accident and a follow-up to the individual.

Regarding the accidents and the victims in this age group, the following parameters were investigated: accident type, frequency, degree of consequences, what type of activity, mechanism of injury, and other aspects that help outline the various occupational activities in Portugal.

The study covered the following five steps:

• Step 1: definition of age group according to the WHO and demographic information of Portuguese elderly;

• Step 2: occupational activities with the greatest participation were identified, in accordance with data from the INE, specifically, the work areas within the three sectors of economic activity, participation in society (formal and non-formal), household chores and leisure activities, and mobility and transport;

• Step 3: review of all information gathered from authorities, institutes and public offices, as well as from scientific meetings, and complete scientific articles from academic open repositories, search engines and online sites.

• Step 4: overall assessment of the accident type, frequency and severity;

• Step 5: register the developments seen in recent years for future analysis.

Regarding literature survey, data of the following bodies and authorities were consulted: National Statistics Institute (INE/PORDATA), Occupational Safety and Health Authority (ACT), Strategic Planning Office (GEP), National Health Institute Dr. Ricardo Jorge (INSA) and National Road Safety Authority (ANSR).

Online searches were performed using several combinations of keywords, always keeping the term accident: statistics of accidents of the elderly, accident prevention with the elderly, accident risks in the elderly.

The review of academic papers work was guided by areas of knowledge, and were accessed through open repositories of higher education establishments, in particular, the later works, dissertations and theses in the categories of health (geriatrics, nursing and psychology), gerontology, social security, education and physical ergonomics and occupational risk prevention, within programs offered at Portuguese universities and academic institutes.

RESULTS AND DISCUSSION

The resolution concerning statistics of occupational injuries due to on-the-job accidents, ensuing from the 16th International Conference of Labour Statistics of the ILO-1998, and published this year in Lisbon by ACT, describes the data that should appear in the statistics of the country where the accident took place, including the whole region under its jurisdiction. As to its scope, this resolution states that the different statistical sources, should as far as possible, include all occupational injuries:

• Fatal injuries and non-fatal injuries that cause an absence from work by, at least, one day, excluding the day of the accident, and, when possible and deemed appropriate, include injuries resulting from commuting accidents, corresponding data must be established and disseminated separately;

• Whenever possible, statistics should cover all workers, regardless of their professional situation (for example, employee, employer and self-employed), should also cover homeworkers, if any;

• Statistics should, in principle, extended to the whole country, all branches of activity and all sectors of the economy.

Countries should collect the following information about the cases of occupational injury: (i) data on the enterprise, establishment or local unit, (ii) data on the injured person, (iii) data on the injury, and (iv) data on the accident and its circumstances.

Regarding personal information of the injured person, the following data should be collected and registered: gender, age, profession and professional situation.

On-the-job accident records, in this case, seeks to understand the type and tendency of occurrences in all tasks of the elderly, with the following objectives:

• Estimation of parameters concerning the incidence, frequency and severity or other applicable parameters;

• Understand the degree of magnitude of accidents occurred in a given period of time;

• Analysis of the efficacy of Workplace Safety & Health management systems and the evolution of prevention performance within the time period under study;

• Measurement of the risk estimation parameters within on risk analyses (quantitative or qualitative) in successive reviews.

The literature review carried out on occupational accident rates among the elderly population aged 65 or over yielded following data:

• The Portuguese elderly population, demographic change (INE/PORDATA 2000-2012) and its condition relative to employment and the labour market, including active and inactive elderly employees (INE, 2013);

• Road accidents, updated monthly, depending on the type occurrence and consequences, frequency, location (inside and outside urban areas), type of itinerary, transportation and incidence by District (ANSR, 2013);

• Domestic and leisure occurrences, within the period 2006-2008, in conjunction with frequency, time of day, location and activity, mechanism of injury, part of body injured and consequences (INSA, 2010);

• Fatal on-the-job accidents, recorded annually (ACT, 2013), and on-the job accidents in 2010 (GEP, 2012), accidents according to economic activity, gender, region, employment status, and professional groups;

Regarding academic papers, bachelors, masters and doctoral theses, and journal articles about the Portuguese

population, 167 were extracted, and of these, two were selected because they provided analyses that took the country's reality into account, and will be discussed further on in this article. The majority of studies and articles were excluded because, although the subject descriptor contained some of the keywords, the Portuguese population was not specifically considered, or the age group of the accident statistics was not specified (in the industry branch or economic activity, daily life activities, and participation in society).

Data Analysis

The literature review on accident statistics proved to be a necessity within the context studying national policies and accident risk management systems among elderly populations. Its completion is scheduled for the end of this year (2014).

Research focused on professional and occupational injuries, regularly compiled and disseminated at least once a year, preliminary data made available after a maximum of one following the end of each registration period, corresponding to the latest reference period of ten years.

Compilation of statistics on occupational injuries occurring during daily life activities was achieved with data from various sources of information, in order to have as complete a picture as possible of the current situation, as well as the developments within the last ten years, as a trend indicator of type and frequency of occurrences. For this purpose, the same concept of accidents (occupational or work) the age factor (Group of people with 65 or more years) was always maintained in order to harmonize the statistics collected from different sources and by different bodies.

At a national level, statistical information on accidents provided by various agencies focused, in particular, on work accidents (only a part of the population), leaving out most of the occupational activities of the elderly.

Through the literature review, it was possible to verify that risk management policies and information systems are supported by parameters related to type of economic activity, size of company, professional group, material agent or other agents, however, scarce data is related to the profile of the individual involved in the accident. Also noteworthy is that in most situations, the data was not updated (GEP/INE/INSA); for example, the data on in-home and leisure accidents – information appropriate for the ADELIA system were transferred to the EVITA system (national accident surveillance system), but no updates with new data have occurred since 2008. Traffic accident statistics (ANSR) are updated on a monthly basis, as are fatal on-the-job accidents investigated the Workplace Safety & Health Authority (ACT), after investigation completion (Fig. 6).
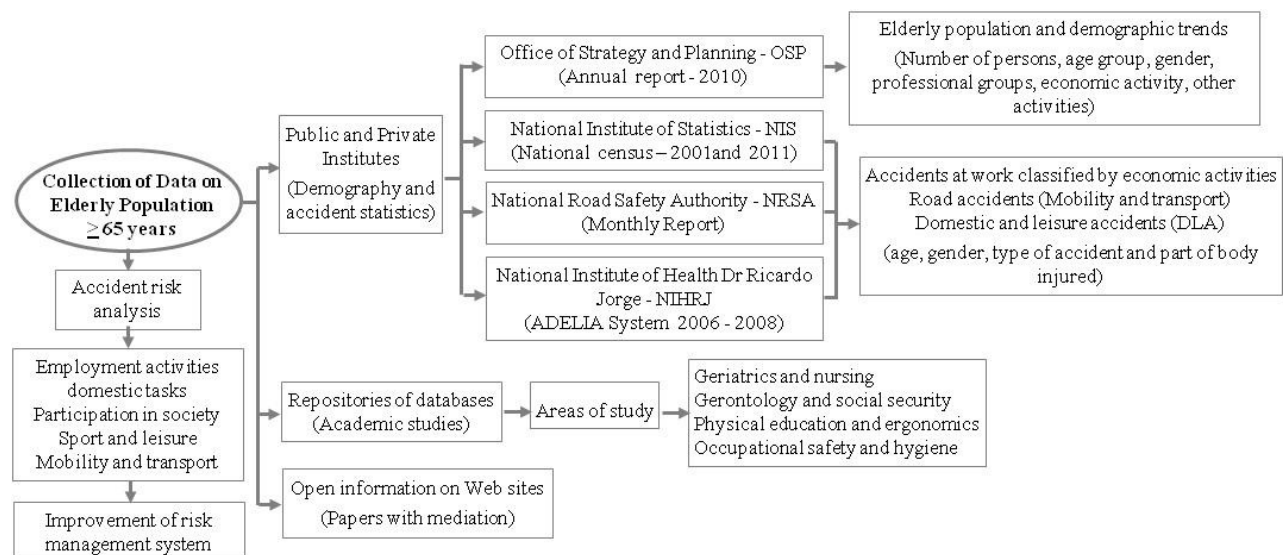

Figure 6 - Process of research and analysis of accident statistics by age group.

The two studies in which statistics were used from accidents occurring among the elderly population and establishing a relationship between the loss ratios data and risk management in that particular activity are: a study about job security in the traditional Portuguese fisheries, and another on the falls with femoral neck fracture among the elderly.

Most of the studies on the activities of the elderly population are focused on specific risks, particularly psychosocial risks, risk of falling and musculoskeletal disorders risk factors, and are carried out among elderly support services or within elderly social support facilities, with limited population samples, as required for case studies.

In the vast majority of these studies, activity description and risk analyses are based on records produced and kept by the institution where the study is being conducted, or they are based on information gathered from international bodies that do not reflect the Portuguese reality, and use global data because no updated national data exists on elderly accidents statistics as related to the various activities. Specifically:

• International Labour Organization (ILO),

• World Health Organization (WHO);

• European Agency for safety and health at work (EU-OSHA);

• The European Union's Statistics Office (Eurostat).

• Executive Agency for Health and Consumers of the European Commission (issues reports containing annual summaries regarding injuries in the European Union, and collecting the relevant available data on mortality and morbidity).

CONCLUSIONS

Accidents are the most obvious and immediate indicator of inadequate and insufficient occupational conditions and, given their frequency and severity, actions against accidents must always first strive to improve prevention measures and to provide appropriate protection to the persons exposed to the risk. Currently, in Portugal, the elderly number over than two million people (18% of the population), and they perform occupational activities as diverse as desired. Individually, they have functional, psychological and social conditions that characterize them as a vulnerable group when exposed to risk, and this is reflected by the increasing incidence of accidents.

In Portugal, registration systems of existing statistical data are coordinated by public agencies, and are oriented to respond to requests from European institutions, such as in the case of traffic accidents or regarding compliance with European Council directives within the context of the labour, and that have been transposed into the national judicial system though several documents that regulate the legal regime of prevention and promotion of safety and health in the workplace, with regard to prevention. These platforms do not follow criteria for integration of multiple systems, for example, a traffic accident occurring on the way to work should not be considered and loaded into the database as a normal traffic accident, but as an on-the-job accident. In many areas, the information available regarding people aged 65 or over, is sparse and oftentimes too specific to extrapolate to the national reality.

Existing data are insufficient to establish a trend for frequency and severity rates of accidents, and also to conduct a more detailed analysis of accident causation when the victims are elderly. These data would enable the identification of causes and contributing factors in the following three key areas: (i) Organization, processes and procedures adopted by each type of activity, (ii) technological and technical means and products used, and (iii) the intrinsic and extrinsic characteristics of individuals within this age group (human factors).

Recognizing the importance of human factors and of the age variable among injured persons when determining accident causality and proposed measures for accident reduction, it would seem appropriate to ponder the needs of this field in order to yield the appropriate information for eager researchers, professionals and the general public, with the ultimate goal of detecting changes in the degree of task and product risk and, simultaneously, substantiate the need for legislation and standardisation (risk management policies) of the activities in which the Portuguese elderly participate.

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