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EXTENDED ABSTRACT

Exploratory Analysis based on Relative Risk on the incidence of different causes of death in mortality in the Region of Aveiro

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Introduction:

The Baixo Vouga Group of Health Centers (ACES) is one of the six ACES belonging to the Regional Health Administration of the Center. According to 2018 data from the National Statistics Institute (INE), ACES Baixo Vouga covers a resident population of 362,100 inhabitants, in which the average life expectancy of this population was estimated at 81.5 years, in the triennium 2015-2017 – lower than the value of ARS Centro (81.7) and equal to that of Portugal.

This work emerged with the aim of understanding which causes of death present a higher risk of death between the years 2015 and 2019. For this, the Relative Risk was used as a measure to evaluate and compare the mortality of the different municipalities with national mortality in order to obtain statistical conclusions regarding the behavior of the different municipalities. [1,2]

Methods:

The data used were first taken from the INE, according to the indicator "Deaths (No.) by Place of residence (NUTS - 2013), Sex, Age group and Cause of death (European Shortlist); Yearly". These data are according to age and sex and divided by county. The aforementioned indicator had many variables, that is, causes of death, and those that did not have relevant data, that is, had missing or few records, were excluded.

Subsequently, PORData was used to obtain the population of each of the municipalities, in order to standardize the same via excel. Having standardized the data, we moved on to statistical analysis through line graphs for each variable / cause of death, to observe the counties with the highest risk for a given variable.

In the same way, national population data were obtained with the objective of statistically comparing the data of each municipality with the national data, and visually it was possible to observe statistically significant differences.

Then, the relative risk of each board was calculated for all variables, in the different biennia and a cohort study was carried out, in which a significance of 0.05% was defined. [2,3]

The entire analysis was carried out using R, including epiR package.

Results:

The results obtained, taking into account the p-value, can be classified into: lower risk of death, if the RR value is less than 1; without association between variables, if the value of RR is equal to 1; and at higher risk of death, if the RR value is greater than 1. According to the Relative Risk values and the p-values, 2 of the municipalities stand out from the others as they present more significant results.

On the one hand, it was possible to observe that the municipality that has a relative risk greater than 1, in a greater number of variables, was the municipality of Anadia. The data relating to this municipality can be seen in Table 1.

On the other hand, the municipality of Aveiro proved to be the one with the highest number of variables with a relative risk of less than 1. The data relating to this municipality can be seen in Table 2.

In addition, the municipality of Murtosa, despite not showing statistical significance in the relative risks, their tendency is to increase. The data relating to this municipality can be seen in Table 3.

Keywords:
Mortality, Relative Risk, Aveiro, Statistical Analysis

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Table 1 - Relative Risk Values for the municipality of Anadia

Anadia	**2015/2016**		**2016/2017**		**2017/2018**		**2018/2019**	
Variables	**RR**	**p-value**	**RR**	**p-value**	**RR**	**p-value**	**RR**	**p-value**
All causes of death	1.12	*	1.15	*	1.27	*	1.26	*
Circulatory system diseases	1.22	*	1.26	*	1.32	*	1.31	*
Digestive system diseases	1.24		1.26		1.67	*	2.03	*
Abnormal symptoms, signs and laboratory and clinical examination findings not elsewhere classified	1.45		1.26		1.53	*	1.49	*

Table 2 - Relative Risk Values for the municipality of Aveiro

Aveiro	**2015/2016**		**2016/2017**		**2017/2018**		**2018/2019**	
Variables	**RR**	**p-value**	**RR**	**p-value**	**RR**	**p-value**	**RR**	**p-value**
All causes of death	0.88	*	0.89	*	0.89	*	0.86	*
Endocrine, nutritional and metabolic diseases	0.59	*	0.66	*	0.66	*	0.53	*
Diabetes mellitus	0.58	*	0.6	*	0.6	*	0.49	*
Circulatory system diseases	0.81	*	0.82	*	0.82	*	0.87	*
Other sudden deaths of unknown cause, unassisted deaths, other ill-defined and non-specific causes	0.35	*	0.22	*	0.22	*	0.36	*

Table 3 - Relative Risk Values for the municipality of Murtosa

Murtosa	**2015/2016**		**2016/2017**		**2017/2018**		**2018/2019**	
Variables	**RR**	**p-value**	**RR**	**p-value**	**RR**	**p-value**	**RR**	**p-value**
Endocrine, nutritional and metabolic diseases	2.09	*	1.82		2.02	*	1.743	
Abnormal symptoms, signs and laboratory and clinical examination findings not elsewhere classified	1.59		2.21	*	2.48	*	2.39	*
Other sudden deaths of unknown cause, unassisted deaths, other ill-defined and non-specific causes	0.72		1.18		1.75		1.91	*

Discussion:

Certain variables were observed that presented a greater risk in certain municipalities. These higher risks could be associated with factors such as age-related comorbidities, other disease-specific risk factors or even misclassification.

The municipality of Anadia has a statistically significant relative risk greater than 1 in several variables, which may be indicative of the wrong use of data insertion protocols, used by professionals of health. These data can be used to determine the causes of these risks of death in order to reduce them in the near future.

Even though the municipality of Murtosa does not have significant relative risk values, as its tendency is to increase, measures similar to those of the municipality of Anadia should be applied. The data can be used to discover the reason for this growth in order to reverse the effect and decrease the risk of death over the next few years.

In the municipality of Aveiro, the relative risk is less than 1 in several variables, which may have clinical use because because understanding the factors behind this lower risk might allow us to change the mortality dynamic in other municipalities with climatic, financial conditions, among others, similar to those of Aveiro.

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