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LETTER TO THE EDITOR

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EUROLD: preliminary results of the ecological study on suicide and its associated socioeconomic variables in people over 85 in Europe

Abstract

The present study aims to compare the suicide rates in people over 85 years of age in relation to overall suicide rates in different European countries. In addition, the study aims to perform a preliminary analysis of which socioeconomic factors could explain higher suicide rates in this age group in Europe. An analysis of the Eurostat database has been made. In this pilot phase, certain socioeconomic variables representative of people over 85 years of age were chosen based on criteria of suitability, according to the bibliography available for other regions and availability of the information provided. The conditional suicide rate in this age group with respect to the overall suicide rate in each country has been calculated. Furthermore, Spearman correlations between the suicide rates in this age group and the chosen socioeconomic factors were performed. Conditional suicide rates in people over 85 years of age show a marked difference between southern and northern European countries. In the correlational analysis, suicide in this age group was associated with different economic ratios, the old-age dependency ratio, and the self-perceived health ratio. After performing a multivariate regression, the model that best explained the differences between the European countries included the variables "old-age dependency ratio" and "economic impossibility to buy new clothes ratio." Different socioeconomic factors, specifically poverty and economic inequality, added to the old-age dependency ratio, could explain huge differences between the suicide rates in people over 85 years of age in the different European countries.

Key words Suicide rates, Elderly suicide, Older adults, Poverty, Old-age dependency

Approximately one person commits suicide every 40 seconds, resulting in more than 800,000 deaths per year worldwide (World Health Organization, 2019). As recognized by international organizations, such as the WHO and the WPA (Bhugra, 2017), suicide prevention and clinical approach are one of the greatest challenges for psychiatry in the 21st century. Regarding this phenomenon, it is necessary to highlight how suicide rates increase markedly with age. These reach their highest figures in people aged 85 years or older, and this increase is very worrying in certain geographical areas (Bonnewyn *et al.*, 2009). Although there is extensive literature on the risk factors that influence at the individual level, the same cannot be said when the problem is analyzed at the population level (Stolz *et al.*, 2016). In this sense, there is interesting work that studies suicide by comparing various factors, using national data as the unit of analysis (Shah *et al.*, 2014). However, no study has been found that makes such a comparison in an elderly European population.

The present pilot study was initiated with the aim of providing information in this area of knowledge, exploring the possibilities of the Eurostat database to provide relevant information in this context. Firstly, a comparison was made of suicide rates in people over 85 years of age in relation to overall suicide rates in different European countries (suicide rate in people over 85 years of age divided by the total rate in the country). Secondly, socioeconomic variables that may be more strongly related to suicide in this age group in these European countries were studied. The study aims to review the entire Eurostat database, relating suicide data from different European countries to any possible variables that may influence suicide. In this pilot phase, certain socioeconomic variables were chosen based on criteria of suitability (according to the bibliography available for other regions of the world; Shah *et al.*, 2014) and availability of the information provided, selecting data from 2015, as it was the most recent year in which most countries (34 European countries) reported their data on suicide in people over 85 years of age.

After calculating the conditional suicide rate in people over 85 years of age with respect to the overall suicide rate in each country (Fig. 1), Spearman correlations were performed between the conditional rates and different demographic variables (emigration; International Migration Statistics, 2021, old-age dependency ratio; Old-Age-Dependency Ratio, 2021), economic variables (Income and Living Conditions (ilc), 2021) (economic deprivation, poverty risk, Gini coefficient; International

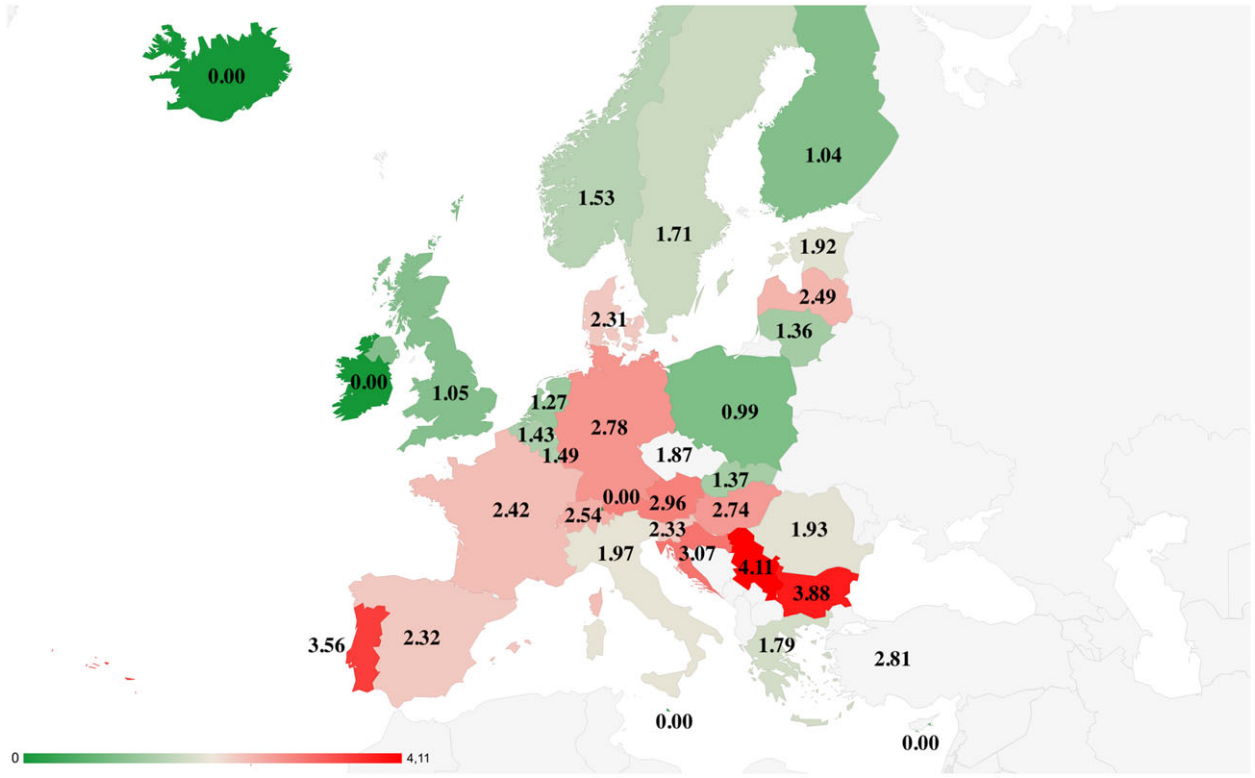

Fig. 1 Ratio between the suicide rate in people over 85 years of age and the suicide rate in the general population in different European countries in 2015.

Migration Statistics, 2021, Internet access, economic inability to access social activities, leisure, clothing, or for personal matters), social variables (Income and Living Conditions (ilc), 2021) (family contact), and health variables (Health variables of EU-SILC, 2021) (self-perceived health, access to health care, chronic disease rate). These variables represent data from people over 85 years of age, except the family contact and poverty risk ones, which represents people over 75 years of age, and the Gini coefficient and the old-age dependency ratio, representatives of all ages.

Conditional suicide rates in people over 85 years of age show a marked difference between southern and northern European countries. In the correlational analysis, several significant associations were found. Suicide in those over 85 years of age was associated with economic variables (social deprivation [$r_s = 0.45$, $p = 0.01$], economic impossibility to buy new clothes [$r_s = 0.55$, $p = 0.04$], impossibility to dedicate money for personal matters [$r_s = 0.6$, $p = 0.02$] and Gini coefficient [$r_s = 0.36$, $p = 0.04$]), demographic (old-age dependency ratio [$r_s = 0.39$, $p = 0.023$]) and health (self-perceived health [$r_s = 0.39$, $p = 0.03$]). After performing a multivariate regression with the variables that were significant in the Spearman correlation, the following model was obtained "$y = -2.644 + 0.141*X_1 + 0.34*X_2$," which included the variables "old-age dependency ratio (X_1)" and "economic impossibility to buy new clothes (X_2)," with a value of R-square = 0.612 and a value of $p < 0.01$.

The conclusions of this study should be interpreted with caution, as they are based on an ecological study. However, promising findings have been obtained. The results suggest that of the different variables studied, the great majority in which an association has been found belong to the field of economics, specifically poverty and economic inequality, and demographics, highlighting the old-age dependency ratio. Furthermore, marked north/south differences can be observed in the different European countries. These economic and demographic differences, in which the southern countries have the worst results, could have a negative influence producing higher suicide rates in people over 85 years of age. In our study, social and health variables have not been significantly correlated with suicide in those over 85 years of age except for self-perceived health. Given the potential of the field of study, we consider it of great interest that other studies confirm the consistency of the conclusions obtained and extend the knowledge of suicide in older people.

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Conflict of Interest

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Description of Authors' Roles

M Rodríguez designed the study, developed the data collection, and carry out the statistical analysis. JP Carrasco was responsible for the statistical design, supervised the statistical analysis, and wrote the paper. G Junquera assisted with the study design, data collection, and with writing the article. EJ Aguilar set the research question, organized the division of tasks and teamwork, and supervised the final version of the paper.

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