**Cross-sectional differences in the level of depression for elderly people in Europe**

**Paper recreation**

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**Summary of the article**

The article examines cross-sectional differences in depression levels among the elderly across various European countries, employing factor analysis to explore SHARE data. The study constructs indices from data-driven latent variables that quantify the level of depression based on responses to the activities module of SHARE, which includes a spectrum of lifestyle and emotional state indicators.

In this paper exploratory factor analysis is used to derive two key latent variables from responses. The first latent variable represents the absence of depressive symptoms, characterized by high positive values indicating a lack of depression. Conversely, the second latent variable signals the presence of severe depressive symptoms, with high values indicating greater depressive states. These variables were used to inspect cross-national differences in depression levels among elderly Europeans.

The factor analysis was performed by examining the correlations between twelve specific activities and emotions surveyed in the SHARE project. This set of activities included questions about feelings of exclusion, lack of control, and isolation, which typically correlate with depressive symptoms. The analysis also considered positive life perspectives and energy levels, which correspond to lower levels of depressive symptoms.

According to the derived latent variables, geographic location significantly influences depression levels among the elderly in Europe. Central and Northern European countries generally exhibited lower levels of depression compared to Southern and Eastern European nations. Bulgaria was noted to have higher depression levels, aligning with other Southern and Eastern European countries.

**Suggestions for improving the results and further research**

To strengthen the findings and assumptions in the paper, it is crucial to further explore the causal relationship between depression and the variables from the activities module. The paper suggests that the level of respondents’ depression might heavily influence how they respond to these variables. For instance, a heavily depressed respondent may report feeling left out and that their life lacks meaning, while a respondent in good mental health may report looking forward to each day and feeling full of energy. However, this relationship might not be straightforward; feeling left out could either be a symptom of depression or a contributing factor to it. Establishing causality in this context is essential to understand the true nature of the relationship between depression and these activities.

Approach to Establish Causality:

To establish causality between activities and depression using the SHARE dataset a comprehensive approach could be employed. First, the data will be prepared by merging across different waves to create a longitudinal dataset with repeated measures for individuals. Exploratory Data Analysis (EDA) will then be conducted to understand trends and distributions. Then we can compare the changes in depression scores between individuals with significant changes in activities and those without. If there is evidence of any new policy or environmental change in any of the countries, influencing in some way the activity levels of elderly people, a pseudo-treatment and control groups could be formed. This longitudinal and methodologically rigorous approach will provide stronger evidence for causality between activities and depression, enhancing the understanding of their relationship.

Additionally, the gv\_imputations module provides a variable called "eurod," which directly measures depression levels based on questions from the mental health module. Utilizing this variable could offer a more precise measurement of depression across different countries, instead of relying solely on the latent variables. By incorporating the "eurod" variable into the analysis, we can validate the findings and potentially uncover more nuanced relationships between depression and the variables from the activities module. This approach can help confirm whether the observed relationships are consistent with the known measures of depression.

Further, incorporating additional socio-economic and health factors into the modelling process can provide a more comprehensive understanding of depression. Variables such as time spent with others, household income, and self-perceived health should be included to examine their potential relationships with depression levels. Analyzing these factors can reveal how different socio-economic and health conditions influence or are influenced by depression, thereby enriching the overall analysis and offering more actionable insights for policymakers and mental health practitioners. By expanding the scope of variables studied, the research can better address the complex interplay between various factors and depression, leading to more targeted and effective interventions.

Further research could delve into exploring gender differences in various health outcomes and economic conditions among the elderly across Europe. An intriguing area of study could be the impact of gender on the prevalence and severity of chronic diseases and mental health issues, such as depression and dementia, especially given the different social roles and life experiences of men and women.

Including questions such as "How satisfied are you with and without activities?" (variables ac037\_ and ac038\_) might also benefit the research results by providing a more nuanced understanding of the relationship between activities and mental health. These questions can capture the satisfaction levels of individuals who engage in few or no activities but still maintain good mental health, thereby highlighting the variability in how different people experience and respond to their activity levels. By considering these satisfaction-related variables, the research can account for those who are content with their low activity levels, ensuring that the analysis does not overlook individuals who are mentally healthy despite minimal engagement in activities. This inclusion would help in distinguishing between lack of activities as a potential cause of depression and personal contentment with low activity levels, thereby refining the overall assessment of depression and its drivers.