

# Supplementary Material

## Prevalence of Mild Cognitive Impairment in Southern Regions of Colombia

### Supplementary Material 1

#### Study Self-Assessment

We have assessed the present study and its report against the ten methodological evaluation criteria for prevalence studies presented by Munn et al. [1]. We present the outcomes from such a self-assessment below.

1. *Was the sample representative of the target population?* Response: Yes

When designing the prevalence study, we took into account the broadest characteristics of the population of interest. The target population for our study consists of adults over 50 years of age residing in two departments of Colombia. We carefully considered various factors, such as age range, gender, and pre-existing medical conditions, among other potentially influential factors, when selecting the study sample. As a result, we are confident that our study sample is representative of the target population, and our findings can be applied to this specific population.

2. *Were study participants recruited in an appropriate way?* Response: Yes

For the present study, participants were recruited using a non-probabilistic convenience sampling method. The recruitment strategy involved visiting various collection groups and activity clubs for older adults in the cities where the evaluations were carried out, as well as using open invitations on social networks and institutional pages to invite individuals over 50 years of age to participate. A sample size of 596 older adults was determined, and 823 participants were ultimately recruited and evaluated using clinical criteria and a complete neuropsychological assessment. This approach was chosen to ensure that the results are generalizable to the population of interest.

3. *Was the sample size adequate?* Response: Yes

The sample size for proportion studies was calculated using OpenEpi, an open source software for statistics in epidemiology. A total population of  $n=78372$  adults over 50 years of age in both departments was taken into account, based on figures published by governmental entities. Previous

prevalence studies in the country suggested an anticipated frequency of 34% (expected prevalence or proportion), and an absolute precision of 5% ( $d=0.05$ ) was deemed appropriate. A design effect of 1.0 was also assumed for studies with random samples. With a confidence interval of 99%, the sample size was estimated to be 596 older adults.

4. *Were study subjects and setting described in detail?* Response: Yes

The article provides a detailed description of the subjects, highlighting their unique characteristics based on various cultural and sociodemographic conditions, such as their level of education, socioeconomic status, place of residence (urban or rural), clinical-medical history, and depression. Moreover, the study included an additional distinguishing feature of the population, namely their exposure to pesticides. This comprehensive account of the subjects enables readers to gain a deeper understanding of the population under investigation and facilitates a more informed appraisal of the research findings.

5. *Is the data analysis conducted with sufficient coverage of the condition?* Response: Yes

In order to control for the impact of neuropsychological factors, the study implemented a carefully selected and adapted set of neuropsychological assessment instruments. The highly qualified personnel administering the assessments ensured that participants remained engaged throughout the study. This approach was effective in producing a comprehensive flowchart (Flowchart 1 in manuscript). The flowchart illustrates the extent of the sample assessed and categorized in accordance with Petersen's criteria Petersen [2]. This meticulous approach to neuropsychological assessment enabled the study to yield more reliable and informative findings about the evaluated condition.

6. *Were objective, standard criteria used for measurement of the condition?* Response: Yes

The study used internationally recognized criteria and guidelines to measure the presence of mild cognitive impairment, with a focus on early detection of Alzheimer's disease. These guidelines were carefully adhered to in order to ensure the reliability and validity of the findings. The interdisciplinary team responsible for analyzing the instruments also adhered to data standards specific to the country (Colombia) where the project was carried out, as described in the article. By adhering to these rigorous standards, the study was able to produce results that are both

scientifically sound and culturally relevant. The instruments utilized in the study had been carefully adapted and validated for use in Colombia [3,4].

7. *Was the condition measured reliably?* Response: Yes

In order to effectively assess the large number of participants (n=823), the study's researchers employed a team of psychologists with specialized knowledge and training in neuropsychology. This team followed a protocol designed specifically for the study, based on international criteria and standardized evaluation methodologies. Any participants who were difficult to classify due to their unique characteristics were reviewed on a case-by-case basis by a panel of experts consisting of psychologists, neurologists, and psychiatrists. This multi-disciplinary approach ensured that any challenging cases were carefully evaluated and classified according to rigorous criteria, in order to ensure the accuracy and validity of the study's findings.

8. *Was there appropriate statistical analysis?* Response: Yes

In this study, a frequency and proportion analysis were carried out to determine the number of participants who presented with mild cognitive impairment, in relation to the total population evaluated. This analysis allowed the researchers to have an overview of the prevalence of this condition in the sample and to obtain an estimate of the percentage of people who might be at risk of developing a neurodegenerative disease such as Alzheimer's disease in the future. Frequency and proportion analyses are useful statistical techniques for describing and summarizing data, allowing researchers to obtain clear and concise information about the distribution of variables and the prevalence of the conditions being studied.

9. *Are all important confounding factors/ subgroups / differences identified and accounted for?*

Response: Unclear

The investigators attempted to control for the most common confounding factors in the study design, such as age, education, socioeconomic status, and place of residence. However, given the heterogeneous nature of the population evaluated and the sample, it is difficult to fully guarantee that there are no confounding factors that could influence the results obtained, despite having used all the tools at your disposal to minimize their impact. Despite these limitations, the researchers made every effort to ensure the integrity and reliability of the results, including careful sample

selection and the use of rigorous methods of data analysis and control. These measures help to mitigate the effects of confounding factors and to maximize the validity and usefulness of the findings obtained.

10. *Were subpopulations identified using objective criteria?* Response: Yes

In the study, objective criteria based on the international criteria for the classification of mild cognitive impairment were used to identify subpopulations within the sample. These criteria allowed researchers to classify cases of mild cognitive impairment into the four subtypes that have been defined by the scientific literature (See Flowchart 1 in manuscript).

## REFERENCES

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- [2] Petersen RC (2004) Mild cognitive impairment as a diagnostic entity. *J Intern Med* **256**, 183–194.
- [3] Aguirre-Acevedo D, Gómez R, Moreno S, Henao-Arboleda E, Motta M, Muñoz C, Arana A, Pineda D, Lopera F (2007) Validez y fiabilidad de la batería neuropsicológica CERAD-Col. *Rev Neurol* **45**, 655–660.
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## Supplementary Material 2

### Some general characteristics of the Colombian Southern Provinces of Huila and Caquetá

The departments of Huila and Caquetá are in the central and southern regions of Colombia, respectively. About 40% of the residents of the department of Huila live in rural areas (out of a total of 1,009,548 inhabitants) and 50.1% are women. The subjective poverty reported is 34.8% and the unemployment rate reaches 9.2%, which is close to the national average (figures prior to the start of the Sars-CoV-2 pandemic). Furthermore, around 39.25% of the inhabitants live in rural areas in the department of Caquetá (out of a total of 502,410 inhabitants) and 50.4% are women. The multidimensional poverty index is 33.6%. The most representative problems in this region are associated with the high greenhouse gas emissions (third position nationwide), which is the result of deforestation and expansion of the agricultural frontier (United Nations Development Program, UNDP, 2019).

In addition to the above, this area of the country has been exposed to the effects of forced displacement, high homicide rates and the consequences of drug trafficking in urban and rural areas, which together with a cumulus of unsatisfied basic needs exert a direct impact on the access to education, which in turn represents a risk factor for the development of cognitive impairment in the medium and long term.

