

# Biodemographic characteristics of longevity and aging in the Portuguese contemporary population from the Coimbra district

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## Rationale

- By 2050 approximately 1.5 billion people across the planet will be older than 65 years of age (Vaupel2010)
- Developments in public health and medical treatments improved human living conditions, and as a consequence, life expectancy doubled in the industrialized nations (WHO 2011)
- This change on the population structure will have serious implications for health-care needs and pension costs and therefore identifying the aspects linked to healthy aging and longevity is of particular attention (Beard & Bloom2015)



Figure 1. What is spatial aging?

➤ This study aims to understand the spatial contemporary biodemographic distribution patterns of longevity and aging indicators of the population from the Coimbra District, Portugal.

## Study design

- Use of specific data from 2011 Portugal national census
- Calculation of five lifespan indicators: life expectancy at birth (LEB); aging index (AI), ultra-octogenarian index (UOI); centenarian index (CI), longevity index (LI), and one social indicator: elders living alone (ELA)

- Cartographic analysis using QGIS

- 155 parishes used for spatial analysis.



Figure 2. Coimbra district study area.

## Spatial distribution patterns of aging and longevity

- LEB obtained an average increase of 1.6 years during the 2004-2011 period. People in Pinhal Interior Norte region live on average 1.2 years less when compared to Baixo Mondego
- In the littoral part of the Coimbra district the population have a lower LI when compared to its interior counterpart
- Uneven spacial distribution of UOI and AI indicators
- NE-SO cardinal orientation pattern for the CI
- High predominance of the social ELA indicator in the interior and rural parishes of the district.

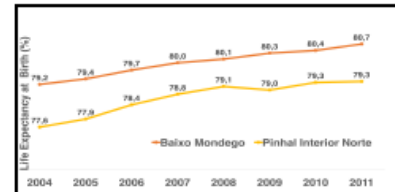


Figure 3. Evolution of the life expectancy at birth indicator (LEB) (%) by NUT III regions, that compose the Coimbra district.

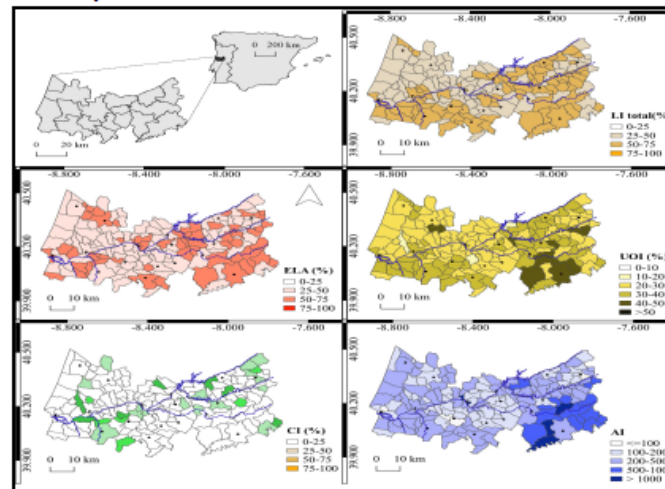


Figure 4. Spatial distribution patterns of contemporary population (2011 census) from the Coimbra district parishes according with their lifespan indicators of aging and longevity: Longevity Index (LI); Elders Living Alone Social Index (ELA); Ultra-octogenarian Index (UOI); Centenarian Index (CI); and Aging Index (AI) indicated in orange, red, yellow, green, and blue respectively.

## Perspectives

• Human longevity is not a common phenomenon, because during most part of human evolution, life expectancy was barely long enough to ensure survival of our species (Carstensen 2016). Only recently, and particularly on the last decade, the lifespan of the population from Coimbra district in Portugal began expanding into their 80s, 90s or even above

• We explored the spatial distributions of the high and low aging and longevity areas in the Coimbra district, which doesn't display a clear and uniform pattern, similarly with what other previous studies found out (Wang & Liu 2015)

• The high ratio of ultra octogenarians and centenarians was observed in the rural parishes of Arganil, Oliveira do Hospital, Tabua, and Pampilhosa da Serra municipalities but also in Montemor-O-Velho and Soure municipalities of Baixo Mondego. The longevity of those areas is still puzzling



Figure 5. Necessity of a culture that supports a long life.

- However the "Elders living alone" indicator also shows that those areas is where we can find most of very old aged people living alone in a household.

## Future research

• Spatial autocorrelation analysis of the biodemographic indicators

• Correlation tests between the biodemographic indicators and regional physical factors such as: topography, temperature, weather and distance to protected areas

• Quantitative social surveys on the areas of interest

• Genetic analysis with associated longevity markers.

## Literature cited

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