Are environmental variables spatially related to neurodegenerative pathologies?

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1. INTRODUCTION

Environmental risk factors for neurodegeneration?

- NO_2
  - Parkinson
  - ...
- $PM_{2.5}$
  - Alzheimer
  - ...
- Temperature
  - Multiple Sclerosis
  - ...
- ...
  - ...

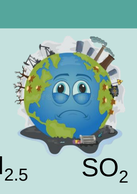
Geographic approaches used?

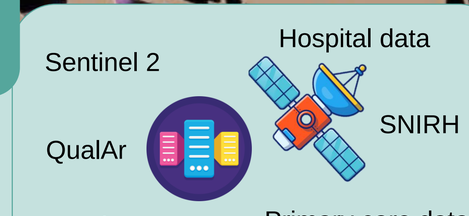
Among others…

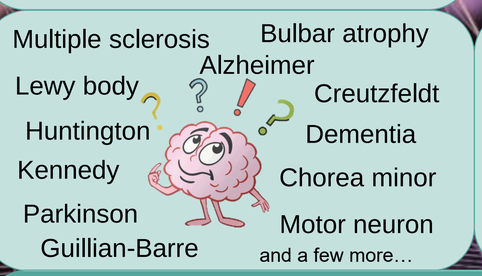
- Comparison of geographical areas
- Spatial interpolation
- Remote sensing

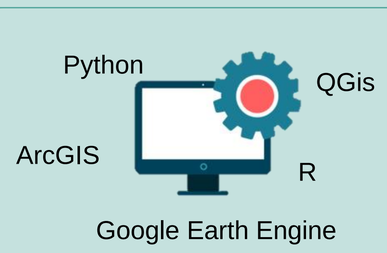
AIM:
To spatially relate environmental variables and neurogenerative diseases

2. METHODOLOGY









How will I put it together?

Correlation

Spatial correlation

Multivariate Linear Regression

Spatial interpolation

Longitudinal models

3. RESULTS (so far…)

34 studies were found concerning spatial analysis of environmental factors in neurodegenerative diseases.

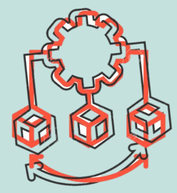
- Multiple sclerosis (56%)
- Motor neuron disease (3%)

- Sun exposure (16%)
- Scarce pollutants (1%):
  - Arsenic
  - Benzopyrene
  - Manganese
  - …

- Administrative division (24%)
- Spatial interpolation (2%)

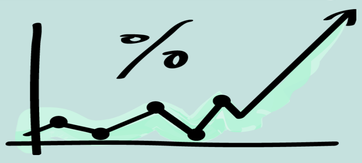
Geospatial analysis of environmental risk factors in neurodegenerative diseases: A systematic review (2020), Oliveira et al., IJERPH

Google Earth Engine, together with Python, are proving to be extremely efficient in handling remote sensing data.



A methodology for computing and validating temperature from satellite imagery and meteorological stations is awaiting for publishing. This may be replicated for further variables.

4. WHAT DO I EXPECT?



Identify spatial patterns and most prevalent diseases in Portugal

Identifying risk factors compliant to those in literature (or not?)

Development of algorithms in Google Earth Engine useful for other diseases and study areas.

Which may result in a tool to…

Improve follow-up in primary care setting

?

WHO AM I?

A PhD student in Health Data Science from the Faculty of Medicine, University of Porto. Fascinated by geographic engineering and public health. Feel free to check my ORCID.

ACKNOLEDGEMENTS

FCT Fundação para a Ciência e a Tecnologia

SFRH/BD/147324/2019

CINTESIS Health.Research.