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Monitoring morbidity associated with chronic conditions

Portuguese National Health Survey 2014

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With the collaboration of:

Instituto Nacional de Saúde Doutor Ricardo Jorge

EUROPEAN PUBLIC HEALTH CONFERENCE

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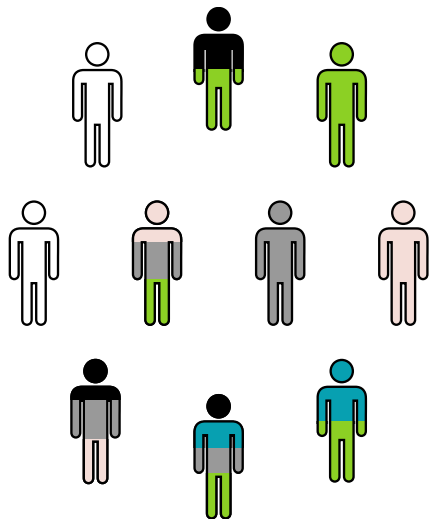
Multimorbidity… *how to study?*



Statistical adjustment (multivariate analysis)

Counts of coexisting diseases

Comorbidity indexes (eg: Charlson)

Observed to expected ratio

Factor Analysis / Principal Component Analysis

Cluster Analysis / Latent Class Analysis

Health and wellbeing... *how to measure?*

The study of **chronic diseases** and their **impact** on the health and wellbeing of populations is essential for evidence based **health planning**, **policy** making and the organization and management of **healthcare services**

- Mortality
- Morbidity
  - Prevalence / Incidence
  - Global indicators (eg: DALYs)
  - Specific indicators

Health and wellbeing... *how to measure?*

Measure of association → *Prevalence ratio (PR)*

Exposure (Chronic diseases) → **PR** → **Outcome** (Specific morbidity indicator)

"Individual association"

Measure of impact → *Population Attributable Fraction (PAF)*

Exposure (Chronic diseases) → **PAF** → **Outcome** (Specific morbidity indicator)

"Populacion impact"

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Proposal of a model and a tool that…

…considers a more realistic approach to the existence of multimorbidities

…studies its impact on specific morbidity indicators

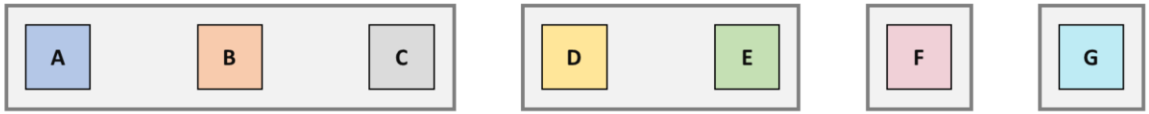
…allows its reproducibility by programming the data analysis in R code

17	**Chronic diseases** (*exposure*)
14	**Specific morbidity indicators** (*outcome*)
4	Confounding variables

Conceptual model

Chronic diseases

Grouping of chronic diseases by their coexistence (PCA)



LEVEL 1: Components
Principal components
(*groups of diseases*)

LEVEL 2: Classes
Possible classes of sufficient causes
(*combinations of diseases within groups*)

Log-Poisson model

$$log\big(E(Y)\big) = \beta_0 + \beta_i x_i + \beta_1 C_1 + \ldots + \beta_n C_n$$
$$for\ C_n\ possible\ considered\ confounders$$

Adjusted prevalence ratio (PR_{aj_i})

$$PR_{aj_i} = exp(\beta_i)$$

Population attributable fraction (PAF_i)

$$PAF_i = p_i \times \frac{PR_{aj_i} - 1}{PR_{aj_i}}$$
$$for\ the\ p_i\ proportion\ of\ subjects\ with\ the\ outcome\ (Y)\ that\ report\ the\ disease(s)\ (x_i)$$

Multimorbidity pattern

Principal component analysis (*Grouping of chronic diseases*)

8 chronic diseases groups

(*components*)

- **Arthrosis**
- **Low back/neck disorder**
- **Allergy**
- **Depression**

- **Asthma**
- **Chronic pulmonary disease**

- **Visual impairment**
- **Hearing impairment**

- **Hypertension**
- **Diabetes**
- **Obesity**

- **Urinary incontinence**
- **Kidney problems**

- **Myocardial infarction**
- **Coronary heart disease**

- **Stroke**

- **Cirrhosis**

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Final considerations

Development and online publication of a tool with results of the impact of the pattern of coexistence of chronic diseases on several specific morbidity indicators, in Portugal and by region (NUTS II)

Programming in R code of the data analysis allowing its efficient use in similar studies (future national health surveys, regional health surveys, national health surveys of other countries, etc.) and in population health monitoring

Research and development team

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