

# Estimating Mental Health Production Functions: What does explain the mental health status of the Portuguese population?

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## Problem:

- ❖ According to the WHO, depressive disorders are the **fourth leading cause of disease and disability** is expected to rank second by 2020.
- ❖ Little is known about the determinants that explain mental health state in the Portuguese population. Few epidemiologic related data is available.
- ❖ The Portuguese National Mental Health Council has developed an action plan to implement measures to improve access to mental health service and to improve key mental health indicators

**Objective:** Generate underlying information about the state of mental health of the Portuguese population (useful for the developing of mental health policies, verifying how different determinants might contribute for explaining the mental health state of an individual).

## Methodology:

### 1. Explanatory Model

The model structures how different determinants might contribute for explaining the mental health state of an individual.

The determinants include factors related with:

- access to mental health services,
- personal characteristics of the individual,
- daily habits,
- stressful events,
- chronic disorders,
- functioning and structure of public supporting services.

### 2. 4<sup>th</sup> Portuguese National Health Survey

Data from the 4<sup>th</sup> Portuguese National Health Survey has been used to test hypothesis defined in the model, whereas **diagnosed depression** was taken as the proxy variable for mental health state.

Survey Characteristics:  
 • reports data from 2005/2006 period  
 • includes individuals living in familiar housing units,  
 • uses representative samples for health regions

This survey allowed to carry out prevalence and incidence studies of depression.

### 3. Statistical Methods

1. **Descriptive studies** → to identify the characteristics of the population with diagnosed depression;
2. **Multivariate logistic regressions** → to detect the explanatory factors contributing for the state of depression in individuals;
3. **Bayesian network** → was proposed as tool to support general practitioners in the detection of depression of an individual (using information from the Survey).

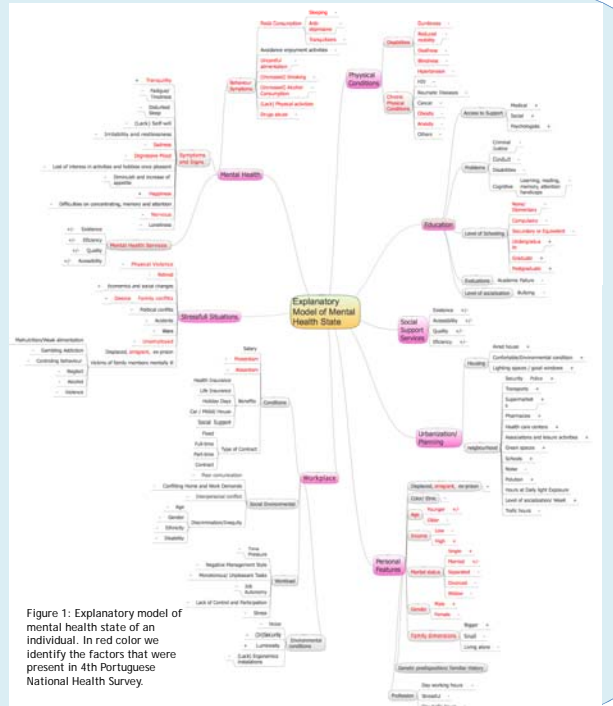


Figure 1: Explanatory model of mental health state of an individual. In red color we identify the factors that were present in 4<sup>th</sup> Portuguese National Health Survey.

## Main Results:

### Prevalence Studies :

Prevalence rate=6,8%

- ◆ Females are **more vulnerable** to depression than males (10,5%/3%).

The groups with **higher prevalence rates** are:

- ◆ females, divorced, retired, unemployed, middle-aged, low education, with chronic anxiety or obesity, live alone or with one person, living in the Centre region and **having high income**.

The explanatory factors having a positive statistically significant impact on the probability of a prevalent individual with depression:

- ◆ females, unemployed, retired, divorced, centre region, **high income, graduate and post-graduate degrees**, middle-aged, having hypertension, chronic pain, anxiety, obesity and bronchitis, and presenteeism.

### Incidence Studies:

- ❖ Depression is affecting a much younger population in comparison to the prevalent population;
- ❖ the determinants of incidence and prevalence quite differ.

### Underestimated Results:

- ❖ prevalent rate of depression (6-7%) is low when compared with data reported in other sources;
- ❖ a high proportion of the population not being identified with depression has depressive symptoms and consumes sleeping pills and anxiolytics drugs

## Bayesian Network:

We have shown how a Bayesian network can be easily used by general practitioners and health care planners for diagnosing depression and planning services. An example:

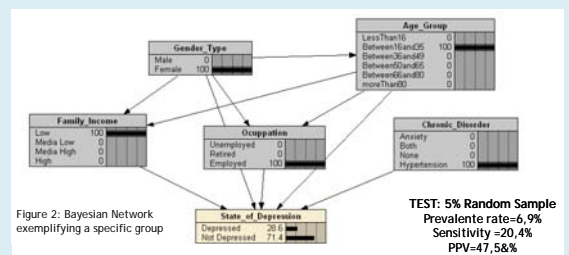


Figure 2: Bayesian Network exemplifying a specific group

TEST: 5% Random Sample  
 Prevalente rate=6,9%  
 Sensitivity =20,4%  
 PPV=47,58%

- ◆ 5 conditional variables → characteristics of the individual or of a group of the Portuguese population.
- ◆ End node → provides the probability of having depression according to selected conditional variables
- ◆ Example: female, with 16 to 35 years old, owning low income, employed, suffering from hypertension → probabilities of depression in such individual or group is around 29%.

## Conclusions:

- Evidence points for an underestimation of prevalent and incident rates in the Portuguese population, which:
  - ❖ might be due to stigma of individuals seeking mental health related services, or because of lack of access of individuals to those services.
- Special attention should be given to the incident population being at risk;
- Bayesian Network could be a useful tool to support the diagnose of depression in the general health services;
  - ❖ ability to predict of the Bayesian network depends on the quality of the data.
- Need for developing additional studies so as to produce more detailed information for decision-makers in the area.
- The 4<sup>th</sup> Portuguese National Health Survey limited the number of hypothesis assessed.

## References:

Mafalda Ramos (2009). Master Dissertation in Biomedical Engineering: Estimating mental health production functions: What does explain the mental health status of the Portuguese population? IST-UTL