

# Loneliness

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# The problem

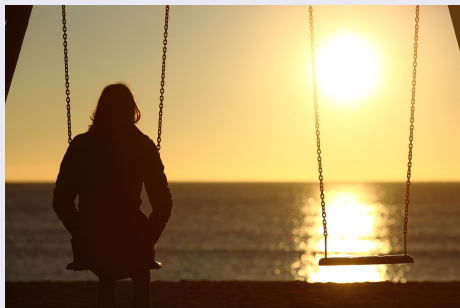
## The problem

We want to relate the causes and effects of loneliness without having to understand loneliness itself.

## An observation

There are no clear boundaries between causes and effects

## Loneliness



# Data collection and cleaning

## Data we looked at

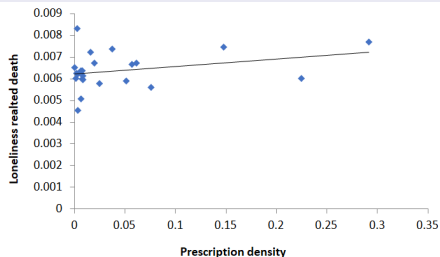
- Migration inflow and outflow
- Living alone / coupled / divorced / widowed
- Benefit claimant density
- Loneliness related deaths (suicide , cirrhosis, mental health, diabetes)
- Prescription of anti-depressive drugs.

## Data cleaning

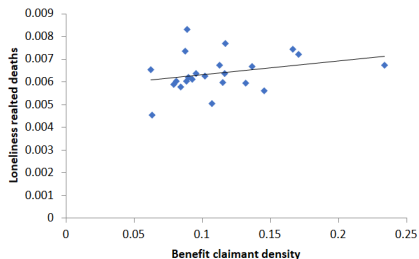


# Correlation between variables

## Depression and loneliness?



## Unemployment and loneliness?

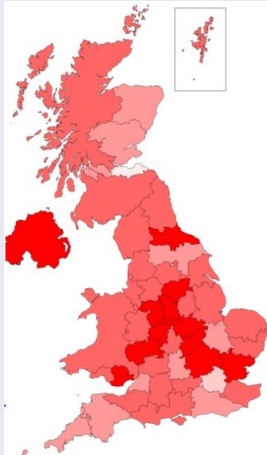


## Improvements

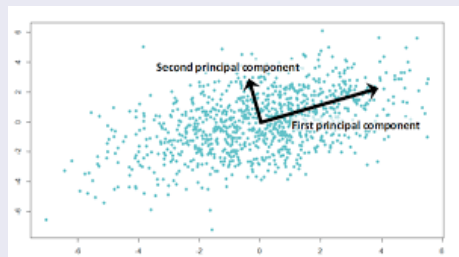
Consider multilevel (or hierarchical) regression

# Mapping loneliness

## Spatial distribution of loneliness



## Principal Component Analysis (PCA)

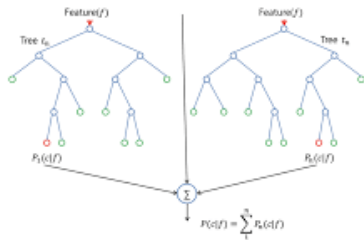


Reduce the many variables associated with loneliness into a low dimensional space of principal components using PCA or factors using factor analysis.

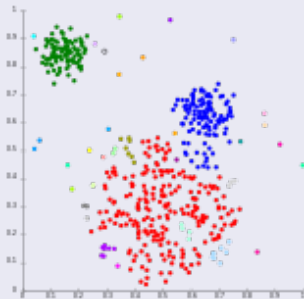
# Learning a nonlinear relation between variables

## Machine Learning and Classical Statistical Inference

### Random Forests



### Cluster Analysis



# Challenges

- Information loss by coarse resolution of geography
- Distinguishing loneliness from other objects of perception
- Developing a falsifiable strategy for loneliness reduction