# Predicting Depression Prevalence in the EU

## The effect of absolute and relative inequality on depression

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# Outline

- Depression: Epidemiological & economic significance
- Predicting National Prevalence Rates
- Depression & Inequality
- Results
- Conclusions

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# A Graying Population

- Dramatic rise in elderly population
  - USA: from 4 million people ages 85+ (1990) to above 40 million projected in 2040.*
  - EU: Population 65+ estimated at 16.6%, projected to reach 25% by 2030.
- Fastest growing age cohort: 85+
- High costs, high dependency, increasing burden on health care services

Valliant GE, Mukamal K. Successful Aging *Am J Psychiatriy* 2001;158:839-47; Lutz, W. 2006; Kinsella K, Phillips D. 2005

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# Epidemiological Significance

- Fourth leading cause of morbidity worldwide, projected to rise to the third in the year 2020. (GBD)
- Lifetime prevalence of depression in the United States ranges from 10 to 20%; 18% in adults 55+
- Across 28 EU countries, 21+ million people afflicted with depression.
- Suicide prevalence for persons 85+ is twice the national average (AAGP).

Hyman S, 2006; Murray & Lopez, 1997; Dietrich, 2003

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# Theoretical Foundations
# Depression & Inequality

What might influence depression prevalence?

1. Absolute Deprivation

   → Poorer countries should exhibit higher disease prevalence

2. Relative Deprivation / Income

   → Countries that exhibit higher rates of societal inequality will suffer higher disease prevalence

3. Individual risk factors

   → Countries with higher prevalence of individual risk factors will exhibit higher rates of disease

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# Theoretical Foundations
# Depression & Inequality

What might influence depression prevalence?

## Absolute Deprivation

Poor economic and public health infrastructure

- Decrepit public health infrastructure
- Restricted economic opportunities
- Meager welfare polices

Ecological studies have shown that mortality rates are highly associated to per capita "social trust, volunteerism, etc."

(Bloom & Canning, 2000; Kawachi & Subramanian, Kennedy, Kaplan)

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# Hypothesis One

- *Hypothesis One: Increased cross-national inequality will lead to differential distribution of depression, where countries that are differentially disadvantaged (by lower levels of economic wealth) will suffer higher prevalence rates.*

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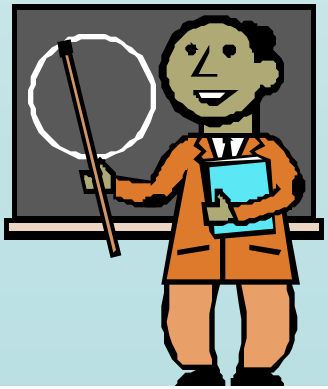
# Societal-Level Inequality

The income relativity hypothesis

- The level of societal inequality and relative deprivation that impacts health gradient and differential morbidity.

- Most dramatic improvement in life expectancies in England and Wales occurred during the time period which included WWI and WWII.

- Numerous studies find that, generally, a nation's life expectancy increases as it becomes more economically equitable



Gortmaker & Wise, 1997; Dreze & Sen, 1989; Mackenbach et al. 2005

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# Hypothesis 2

- *Hypothesis Two:* Countries with the most extreme gradients should experience the highest rates of depression, as their internal disparities are the greatest.

- In unequal societies, individual-level factors will not be as protective as in equal societies, thus unequal societies will display higher prevalence.

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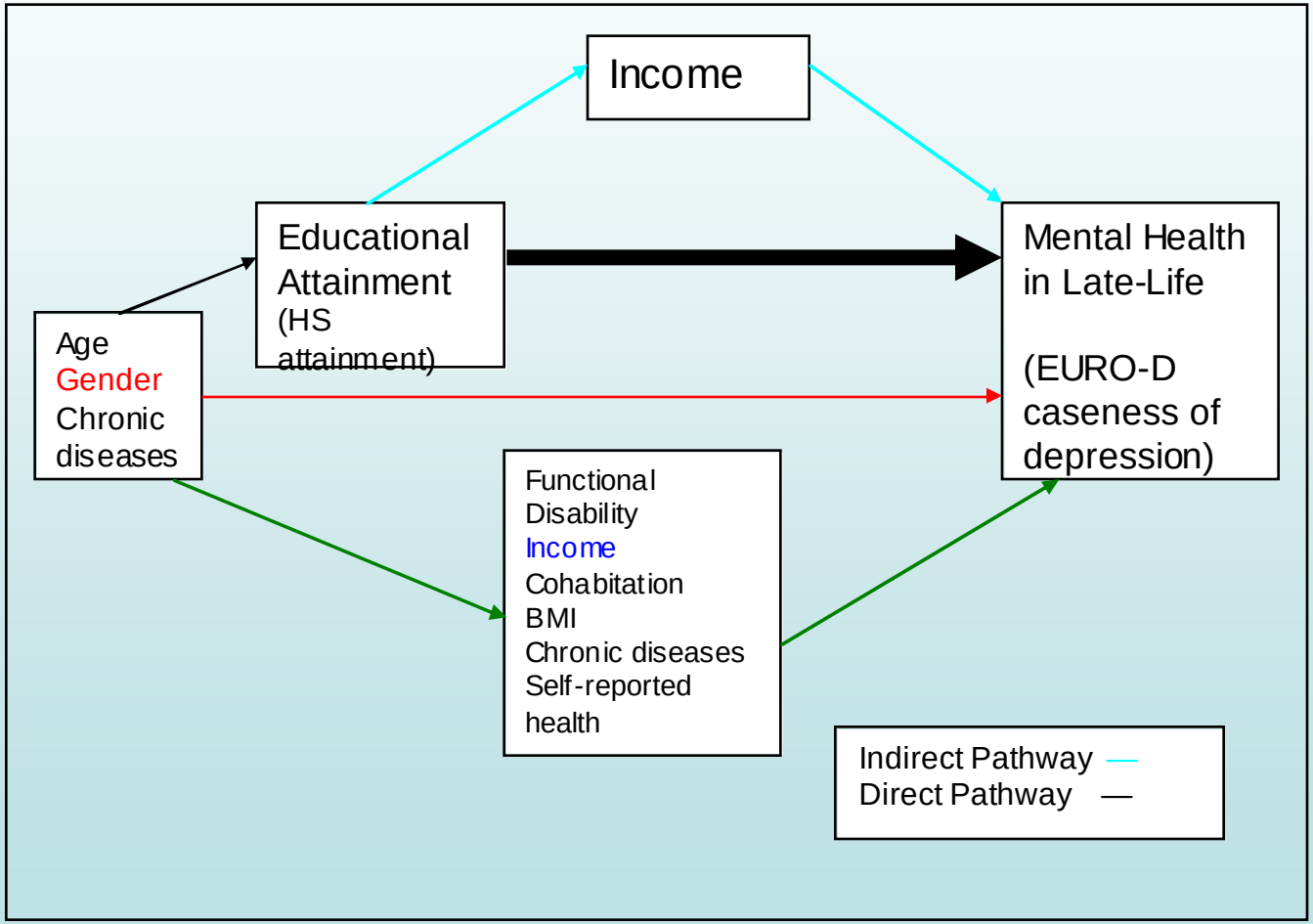
# Individual-level Determinants Proposed Pathway

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# Hypothesis Three

- Countries with highest prevalence of risk factors should exhibit higher rates of depression
- Countries where risk factors convey highest degree of relative risk also should present higher rates of depression

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# Methods

- Measures
  - Euro-D (clinically significant cut-point)
  - GDP (National-level economic inequality)
  - Gini Index (Societal inequality)
  - Education (ISCED-97)
  - Income (HH-adjusted individual)
  - Age, gender, functional mobility, presence of chronic disease, cohabitation

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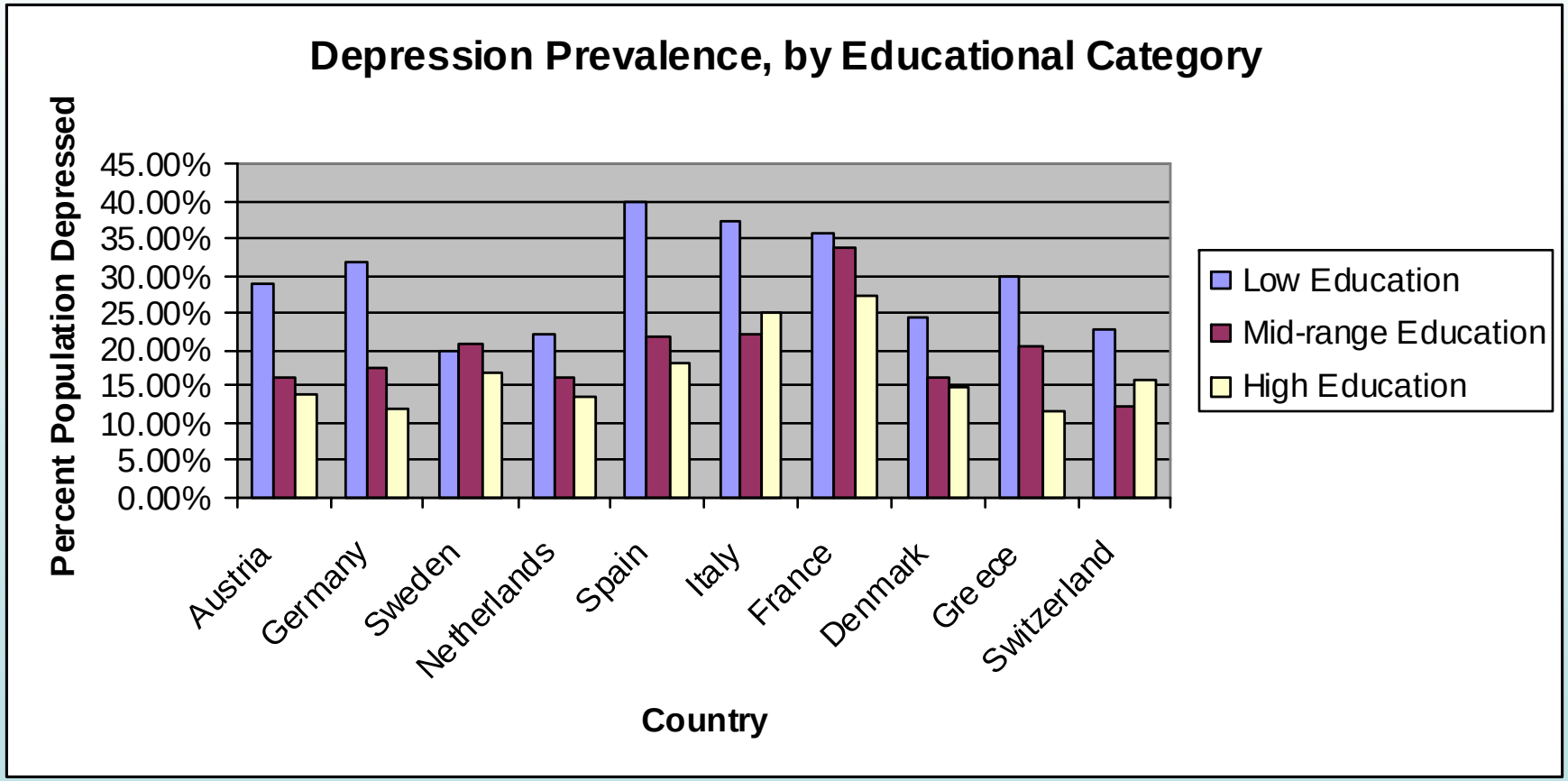
# Results:
# Descriptive Statistics

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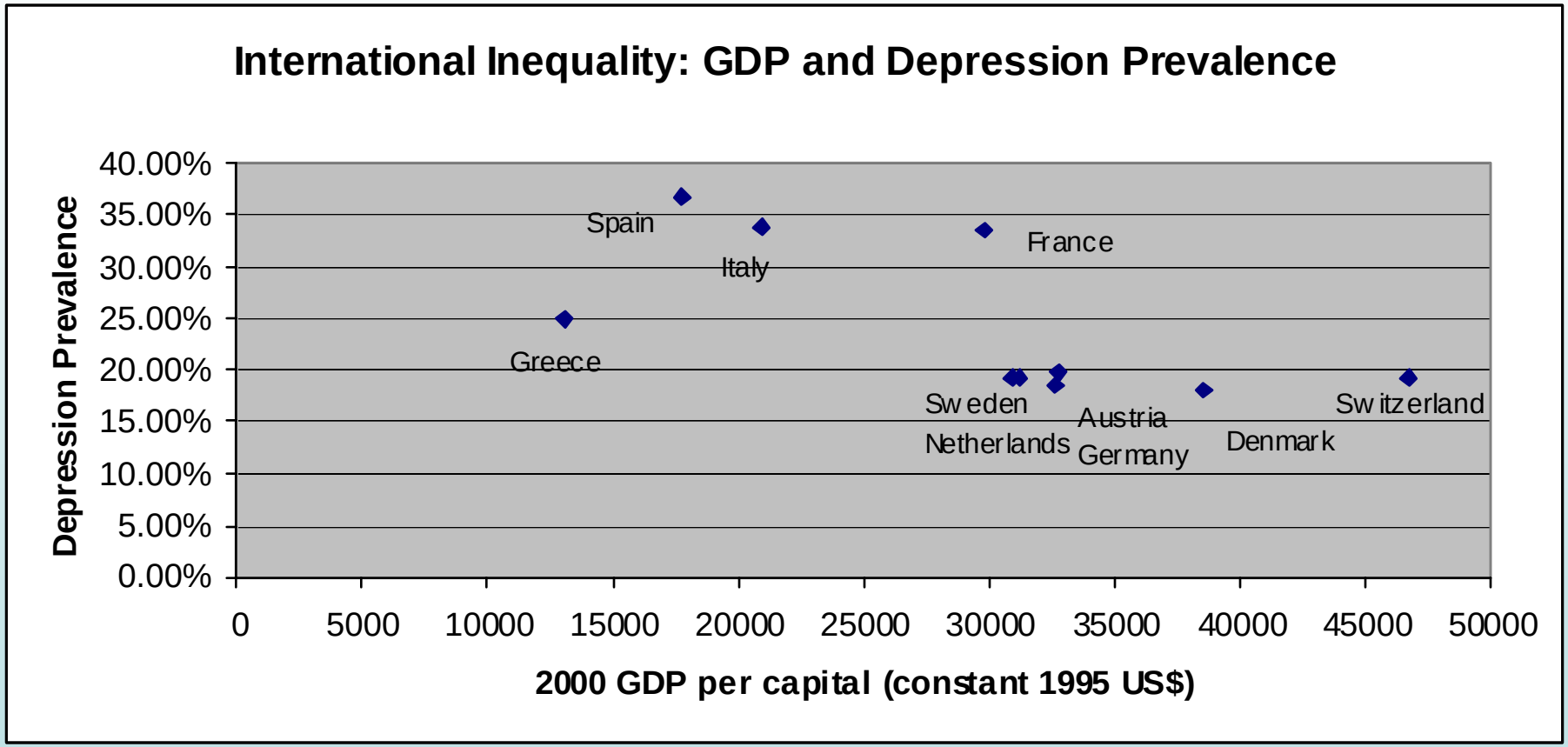
# Results: International Inequality




Correlation between GDP and depression prevalence = -0.6452 (p= 0.044); regression coefficient: -.0004874 (p= 0.044 )

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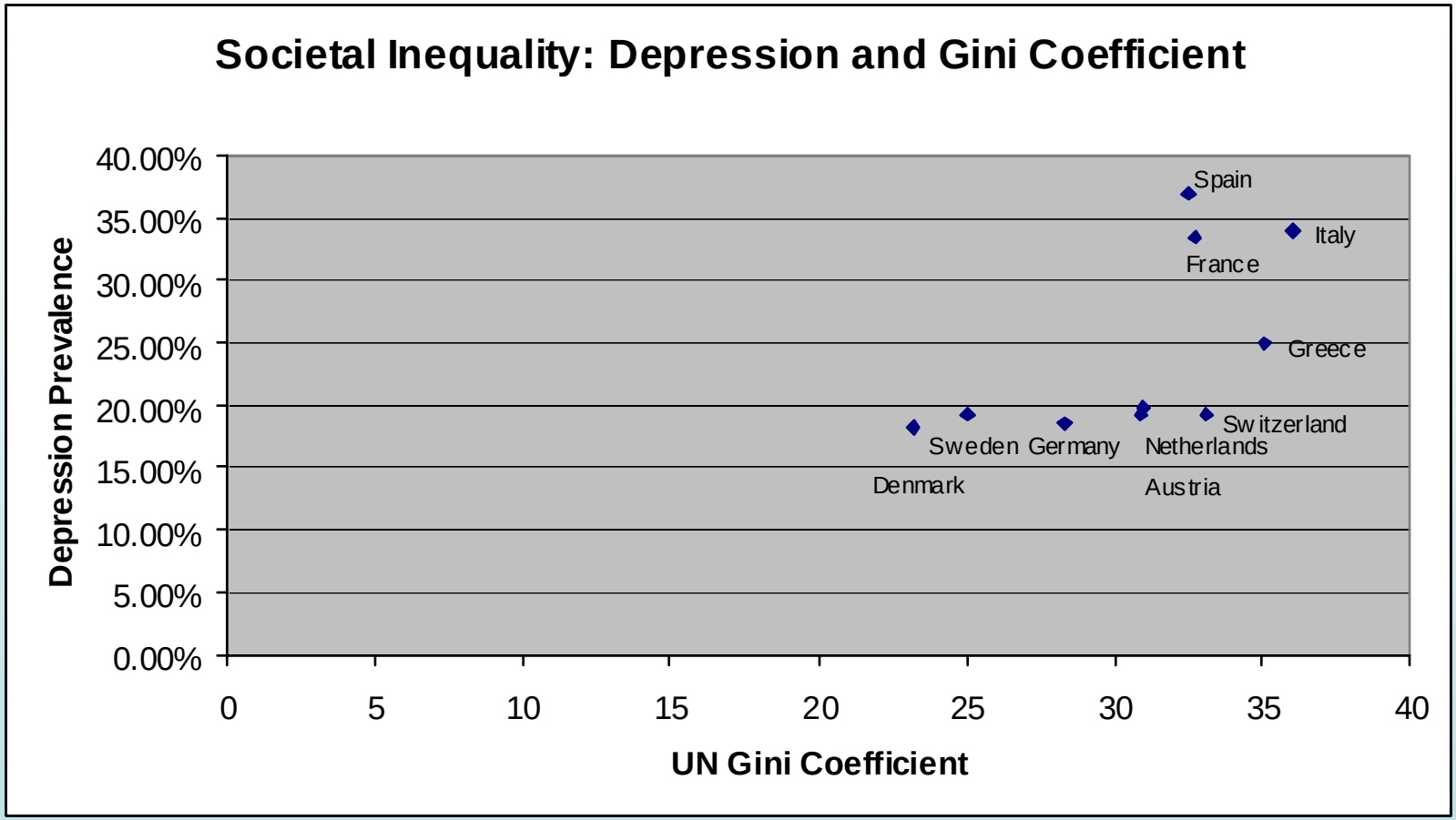
# Results:
# International Inequality- GDP & Depression




Correlation between Gini and Depression = 0.6315
(p= 0.05); regression coefficient = .9116866 (p= 0.050)

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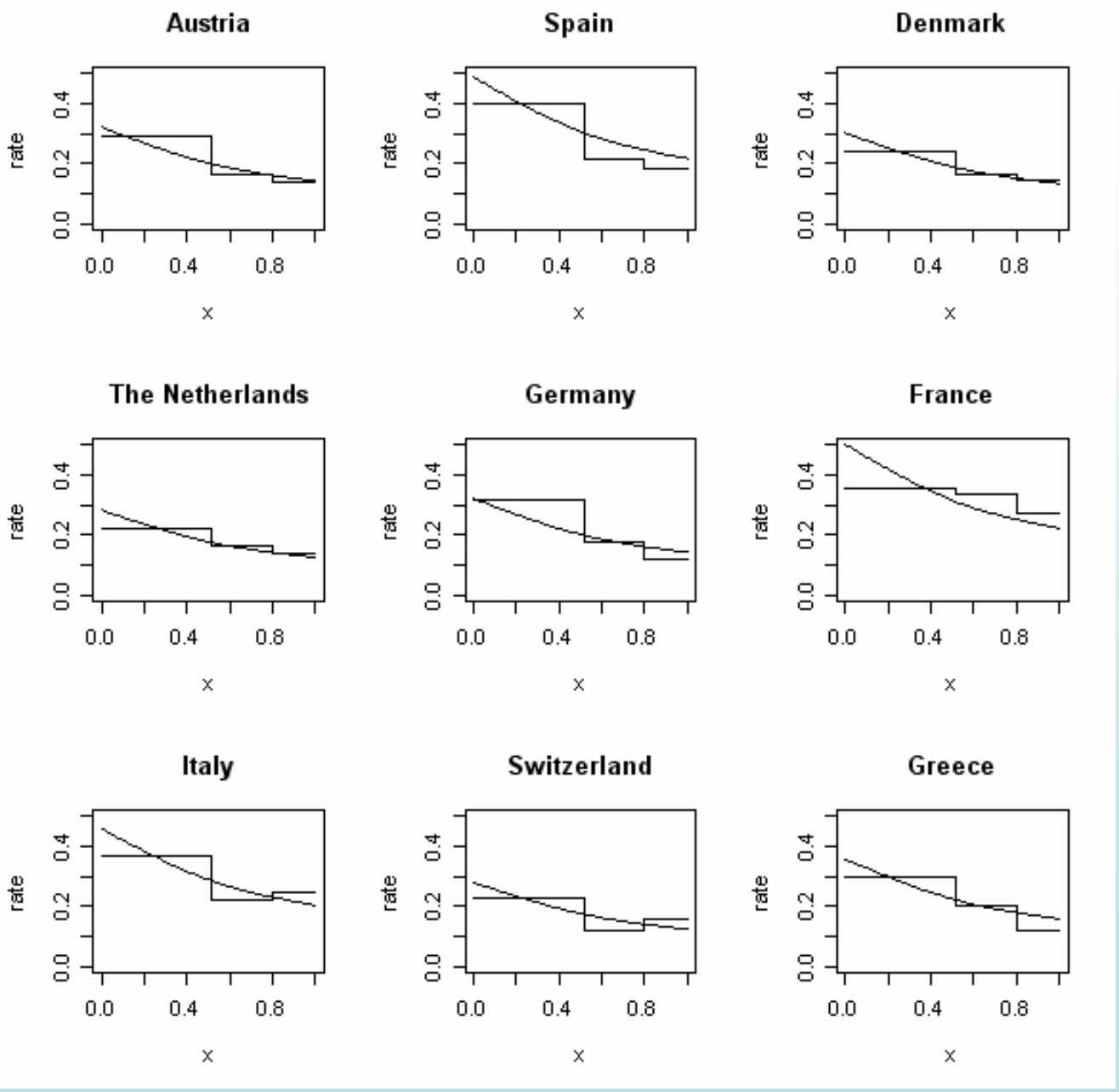
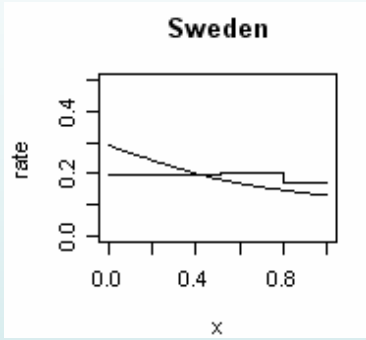



# Relative Index of Inequality (RII)

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# Results:
# Individual- level Inequality

| | Depression Odds Ratio | |
|---|---|---|
| | **Low Education** | **High Education** |
| **Sweden** | 0.97 | 0.74 |
| **France** | 1.11 | 0.74 |
| **Netherlands** | 1.42 | 0.81 |
| **Greece** | 1.59 | 0.46 |
| **Denmark** | 1.59 | 0.86 |
| **Switzerland** | 1.59 | 1.02 |
| **Italy** | 2.06 | 1.26 |
| **Austria** | 2.14 | 0.86 |
| **Germany** | 2.17 | 0.61 |
| **Spain** | 2.43 | 0.81 |

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# Results:
# Individual- level Inequality

| Country | Low education | p-value |
|---|---|---|
| Spain | 1.67 | 0.012 |
| Italy | 1.65 | 0 |
| Austria | 1.53 | 0.00 |
| Germany | 1.45 | 0.00 |
| Netherlands | 1.27 | 0.058 |
| Switzerland | 1.54 | 0.057 |
| Denmark | 1.13 | 0.477 |
| Greece | 1.11 | 0.475 |
| France | 0.90 | 0.414 |
| Sweden | 0.88 | 0.288 |

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# Conclusions

- Inequality matters, at all levels
- Both macro-level and individual-level predictors are important for understanding and projecting risk of depression

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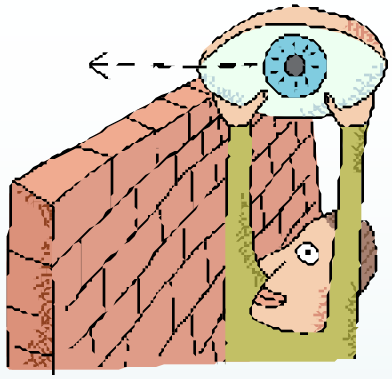
# Limitations



- Causality
- Euro-D
- Potential for confounding

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# Future Studies

- Which level is most important?
- In what ways might their influence vary? (severity, prevalence, influence on other factors, etc.)
- In what ways might these effects be mitigated?

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# Questions?

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# Notes

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# Results:
# Societal Level - RIIs

| **Austria** | **Denmark** | **France** | **Germany** | **Greece** |
|---|---|---|---|---|
| 0.0000 | -0.0613 | 0.4455 | 0.0006 | 0.1070 |
| | | | | |
| **Italy** | **Spain** | **Sweden** | **Switzerland** | **Netherlands** |
| 0.3569 | 0.4190 | -0.0982 | -0.1369 | -0.1292 |

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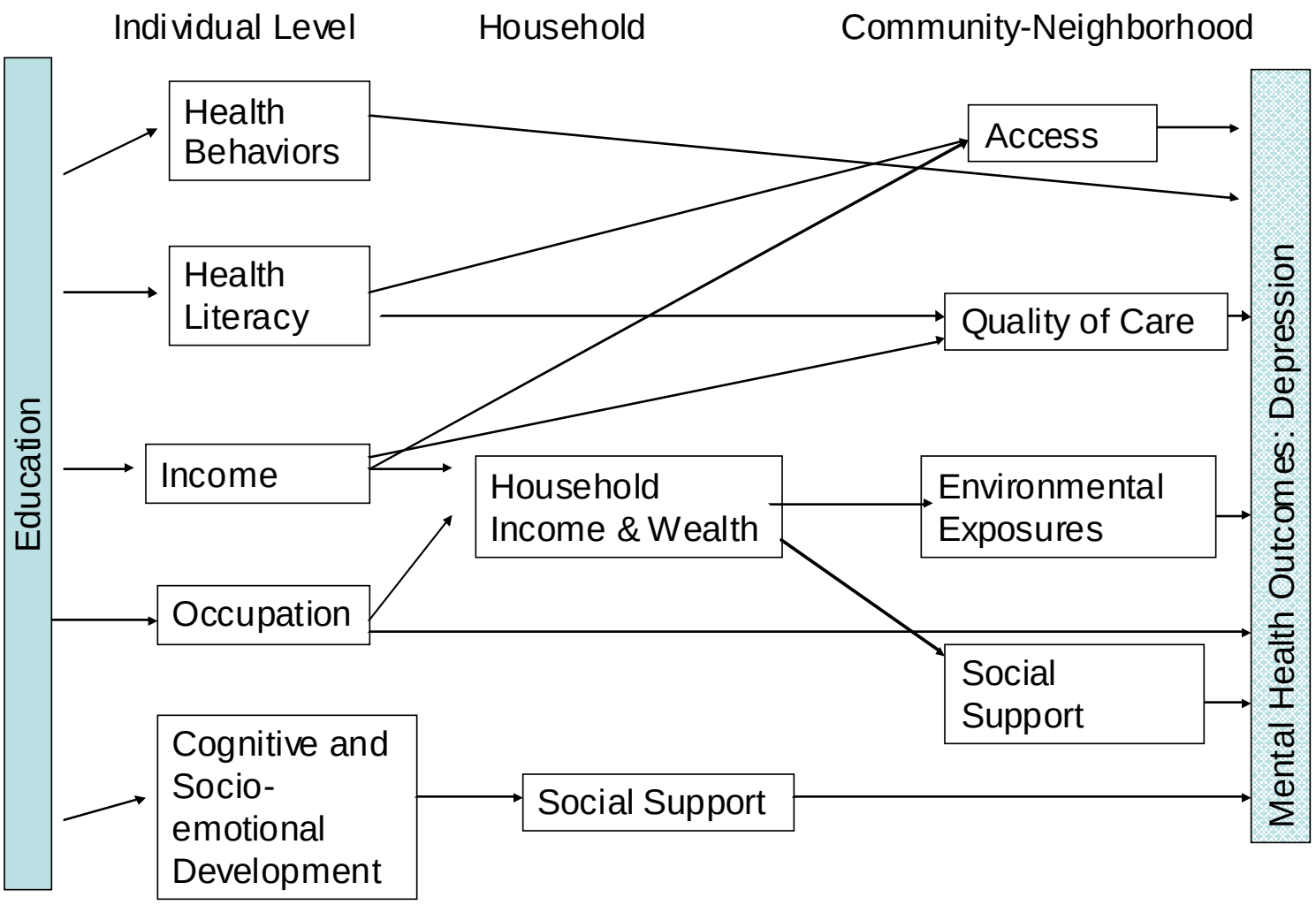
# Proposed Causal Pathways

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