

About myself

Lars Seemann

PhD Candidate at the Department of Physics

August 3, 2011



Outline

① Who am I?

② Where do I come from?

③ What do I do?

Econophysics

Social Epidemiology

Gene networks

My wife, Nancy, and I...



.... are living with two dogs and an aquarium.

About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

Econophysics

Social

Epidemiology

Gene networks

Where do I come from?

About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

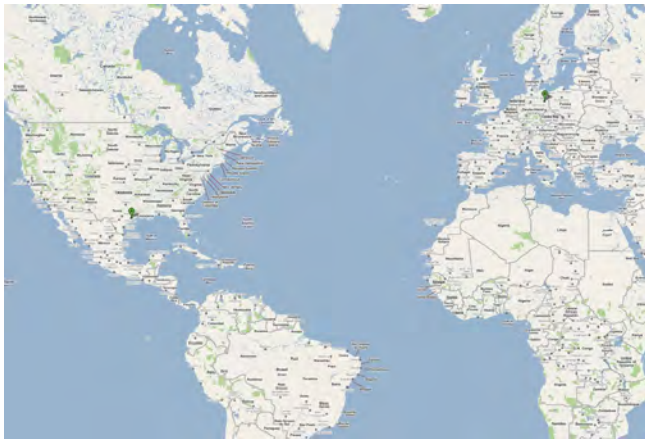
Econophysics

Social

Epidemiology

Gene networks

Hometown Berlin, Germany, 1984-2004



Hometown Berlin, Germany, 1984-2004



- Capital of Germany (≈ 3.5 mio)
- Divided during the Cold War ("Berlin Wall")

About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

Econophysics

Social

Epidemiology

Gene networks

Backpacking Australia, 2004



Physics in Heidelberg, Germany, 2005-2007



- Oldest university in Germany (founded 1386)
- Economics + Physics = Econophysics

Physics in Houston, 2007-???



- Unique Econophysics PhD program

About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

Econophysics

Social

Epidemiology

Gene networks

What do I do?

About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

Econophysics

Social

Epidemiology

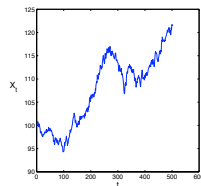
Gene networks

Econophysics / Complexity of Financial Markets



?

⇒



Social Epidemiology

Aim: Explanation and prediction of health and health-related behavior of a population



Abdulrahman M.
El-Sayed



Sandro Galea
(Chair of Epidemiology)



About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

Econophysics

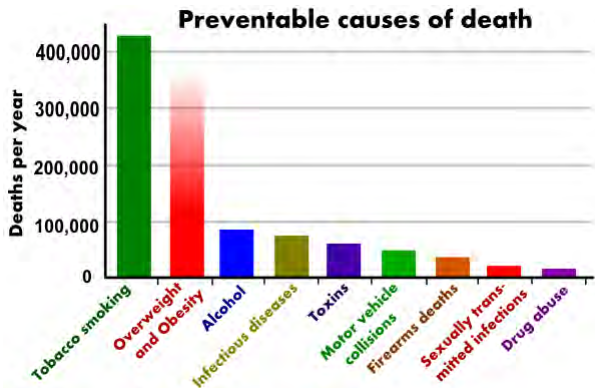
Social
Epidemiology

Gene networks

What are the leading (preventable) causes of death worldwide?

[About myself](#)

Lars Seemann

[Who am I?](#)[Where do I come from?](#)[What do I do?](#)[Econophysics](#)[Social Epidemiology](#)[Gene networks](#)

Childhood obesity in the USA might result in the first reversal of life expectancy!



causes



- Genes?
- Individual behavior (food portions, dietary habits, exercise...)?
- Surrounding (availability of grocery stores, advertising of high caloric foods)?
- ...

No experiments \implies Modeling of population

About myself

Lars Seemann

Who am I?

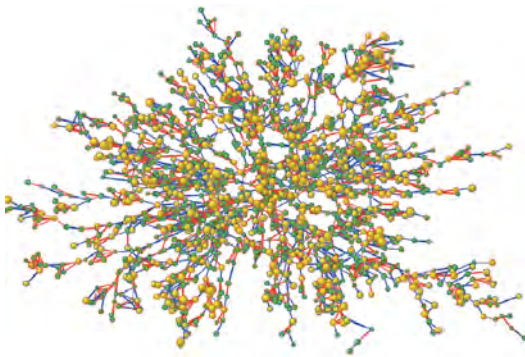
Where do I come from?

What do I do?

Econophysics

Social
Epidemiology

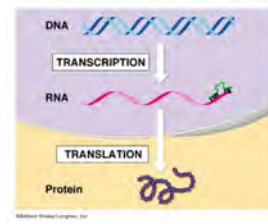
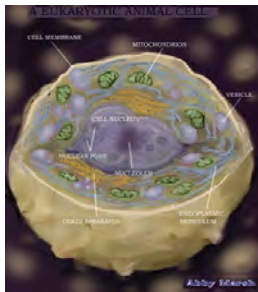
Gene networks



Christakis and Fowler (2007)

Gene networks

Current paradigm:

Question: We have a lot of genes \implies How do they work together?

About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

Econophysics

Social
Epidemiology

Gene networks

How many cells form the human body?

About myself

Lars Seemann

Who am I?

Where do I come from?

What do I do?

Econophysics

Social

Epidemiology

Gene networks

100.000.000.000.000

Gene Networks



Figure: Gene regulatory network in Prostate cancer

- Too complicated \implies Simplify!
- Our simplified model predicts behavior of network.
- Application: Cancer research

Why Science?

- Very interdisciplinary!
- Science can solve important real world problems!
- Science is fascinating!
- The world needs scientists and engineers!