

# From a conservative to a liberal welfare state: decomposing changes in income-related health inequalities in Germany, 1994-2011

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# Motivation: welfare states, health, and health inequalities

- inverse relation between socio-economic status and health
- individual factors account for large parts
- welfare states mediate associations between socio-economic status and health
- welfare state retrenchments may foster inequality
- welfare state arrangements and health inequalities: two potential pathways:
  - ① may affect influence of determinants of health and health
  - ② determine distributions of determinants of health within a society

# Germany's welfare state before the 1997/98 reforms

- entitlement criteria based on duration of employment
- benefits determined by wage-dependent contributions to unemployment insurance
- job offers were considered unsuitable if field of occupation or salary were inferior to former occupation
- those not entitled received basic, means-tested social benefits

# The liberalization of Germany's welfare state

- the 1997/8 reform
  - limited definition of suitable employment to wage threshold (decreasing over time)
  - relaxation of labor market regulations (fixed term and minor employment)
- The Hartz-reforms (2002-2004)
  - relaxation of labor market restrictions (minor, fixed term and precarious employment)
  - reduction of unemployment allowances
  - combination of long term unemployment benefits with social benefits to a basic, means-tested benefit

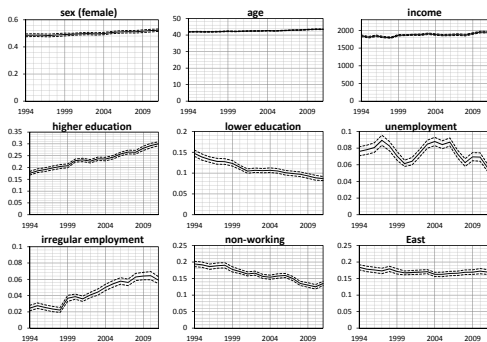
# Research questions

- ① How did income-related inequalities in self-assessed health evolve over time?
- ② How did the contributions of the social determinants of health evolve over time?
- ③ How can these changes – if any – be explained?
- ④ Are there considerable temporal coincidences with the welfare reforms?

# Data: Socio-economic Panel (1994-2011)

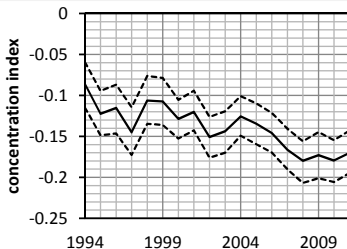
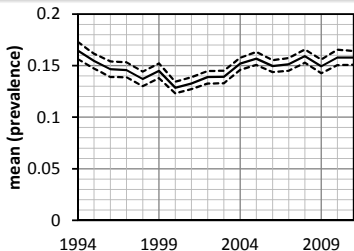
- data from Socio-economic Panel (SOEP v28)
- response rate  $\approx 60\%$
- repeated cross-sectional data for 1994-2011
- only individuals between 25 and 60

## Means of explanatory variables



(annual estimates)

# Prevalence and inequality of unsatisfactory health



- concentration index  $C = \frac{2}{n\mu} \sum_{i=1}^n y_i r_i - 1$
- measures twice the area between concentration curve and line of equality
- $C \in (-1; 1)$
- $C < 0 \Rightarrow$  concentration of  $y$  among the worse-off
- $C > 0 \Rightarrow$  concentration of  $y$  among the better-off
- the higher  $|C|$ , the more inequality
- income-related inequalities in unsatisfactory health doubled over time

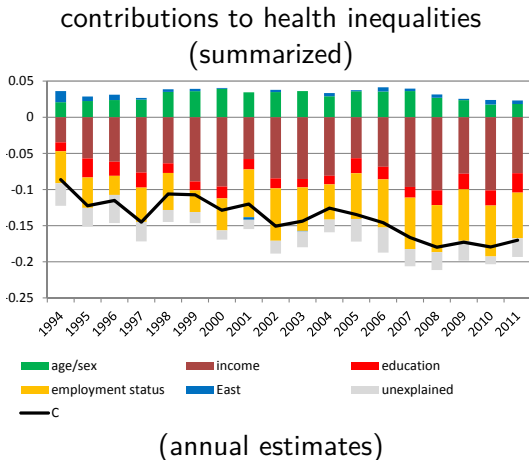
# Explaining health inequalities: decomposition of the concentration index

- $y$  is binary  $\Rightarrow$  Probit model:  $y = G(\beta_0 + \sum_k \beta_k x_k + \epsilon)$
- approximate elasticities  $\tilde{\eta}_k = \frac{\tilde{\beta}_k \bar{x}_k}{\mu}$  via partial effects  $\tilde{\beta}_k = \left. \frac{\partial G(\cdot)}{\partial x_k} \right|_{\bar{x}_k}$
- decomposition of concentration index  $C$ :  
$$C = \frac{2}{n\mu} \sum_i y_i r_i - 1 \approx \sum_k \frac{\tilde{\beta}_k \bar{x}_k}{\mu} C_k + \frac{GC_\epsilon}{\mu}$$
- the contributions  $\frac{\tilde{\beta}_k \bar{x}_k}{\mu} C_k$  indicate how  $C$  would differ if
  - $x_k$  was unrelated with health:  $\tilde{\beta}_k = 0$
  - $x_k$  was equally distributed across income groups:  $C_k = 0$

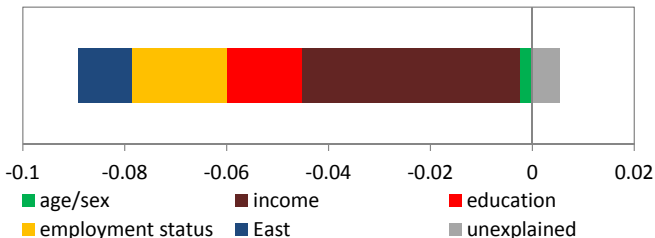


# Decomposition results: summarized contributions

- *negative contributions*: a factor “draws” prevalence towards the poor
- *positive contributions*: a factor “draws” prevalence towards the rich
- socio-economic determinants of health contribute to inequalities
- age, sex and East mediate inequalities
- decreasing unexplained part: model accuracy improved (socio-economic factors became better predictors over time)



# Contributions to change 1994–2011 (summarized)



- income, education and employment status explain most of the change
- East mediated health gradient only in the first years
- age and sex contribute only little
- unexplained part suggests that model would predict stronger change of  $C$

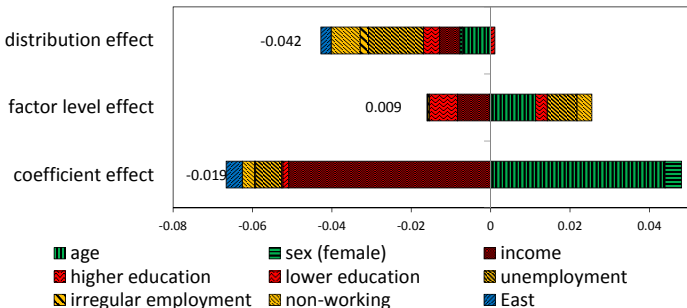
# Changes in associations or changes in distributions?

- change in the concentration indices  $\Delta C = C_t - C_{t-1}$  can be decomposed into the sum of the changes in the factor contributions
- total differential approach:

$$dC = -\frac{C}{\mu} d\tilde{\beta}_0 + \frac{\bar{x}_k}{\mu} \sum_k (C_k - C) d\tilde{\beta}_k + \frac{\tilde{\beta}_k}{\mu} \sum_k (C_k - C) d\bar{x}_k \\ + \sum_k \frac{\tilde{\beta}_k \bar{x}_k}{\mu} dC_k + \frac{dGC_\epsilon}{\mu}$$

- further decompose  $\Delta C$  into
  - **factor level effect:** change of  $C_y$  numerically induced by change of  $\bar{x}_k$
  - **coefficient effect:** change of  $C_y$  numerically induced by change of  $\tilde{\beta}_k$
  - **distribution effect:** change of  $C_y$  numerically induced by change of  $C_k$

# Decomposition of changes in factor contributions

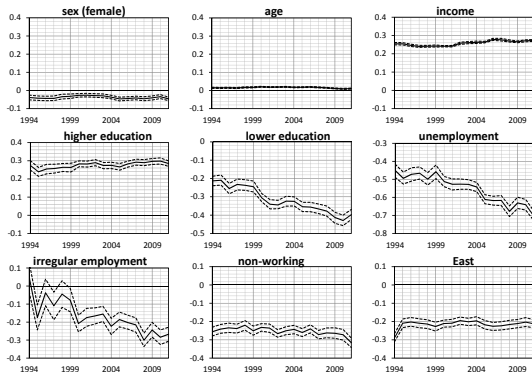


- **distribution effects:** income, lower education, unemployment, irregular employment and non-working increased inequalities ( $C_k \uparrow$ ); age, East ( $C_k \downarrow$ )
- **factor level effects:** decreased unemployment rate and share of lower educated and non-working individuals mediated change of  $C$
- **coefficient effects:** stronger associations of income, non-working and unemployment with health

# Income-related distribution of explanatory variables

- relative income position of unemployed, lower educated and irregularly employed decreased
- income inequality increased slightly
- higher educated are slightly better-off

## concentration indices of explanatory variables



(annual estimates)

# Answers to the research questions

- ① How did income-related inequalities in self-assessed health evolve over time?
  - no considerable change in the prevalence
  - income-related inequalities in unsatisfactory health roughly doubled
- ② How did the contributions of the social determinants of health evolve over time?
  - contributions of income and unemployment increased
  - living in East Germany contributed only in the first years

# Answers to the research questions

- ③ How can these changes – if any – be explained?
  - associations changed only little
  - prevalences changed to some extent but had only little impact on the contributions
  - changes in contributions are largely attributable to income-related redistributions of social determinants of health
- ④ Are there considerable temporal coincidences with the welfare reforms?
  - no considerable changes are observed around the 1998 reforms
  - considerable changes are observed between 2005 and 2008 (i.e. after the Hartz reforms)

Thank you for your attention!