Unfair inequalities in health in the Netherlands: contributions of choices regarding lifestyles

Work in progress

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Introduction

- Socioeconomic inequality in health: concentration index (Wagstaff et al, 1991)

- New framework for measuring health inequality (Fleurbaey and Schokkaert, 2009)

  - Literature on socioeconomic inequalities and social choice theory on equity, responsibility and compensation (Roemer, 1998)

  - Total unfair inequalities *vs* socioeconomic-related inequalities

  - Different look at legitimate and illegitimate sources

  - Structural model → assess importance of differences sources

This paper

- Apply F&S framework to measurement of unfair inequalities in mortality risk in The Netherlands

- Focus on contributions of lifestyles (smoking, drinking, obesity, exercise)

- Analyse inequities under different normative choices:
  - Legitimate, illegitimate sources of inequality
  - Channels through which these sources affect health

- Some previous related literature:
  - Balia and Jones (2008): structural model
  - Rosa Dias (2008): inequality of opportunities

Structural model
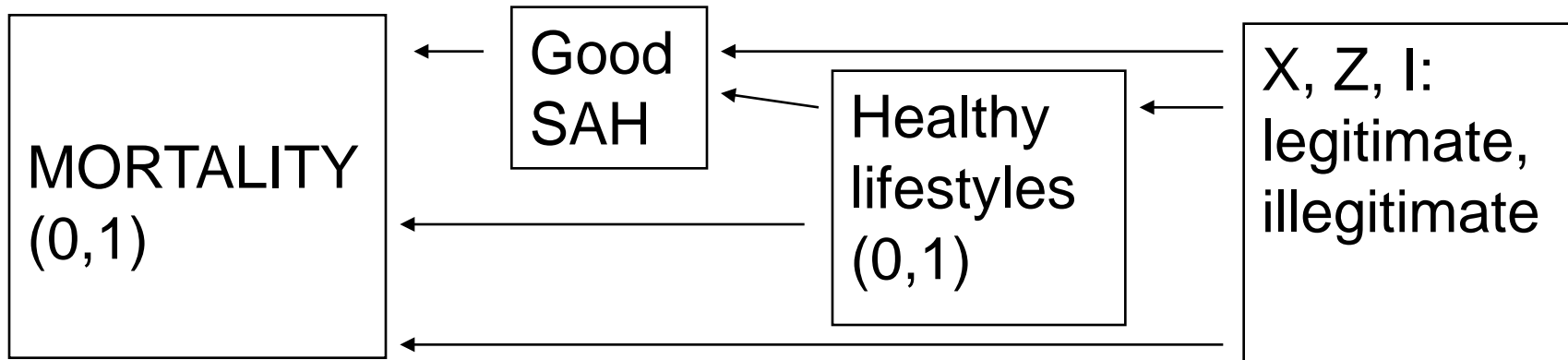
$$d_i^* = \alpha\ h_i + \beta_d L_i + \gamma_d X_i + \varepsilon_{id}$$

$$h_i^* = \beta_h L_i + \gamma_h X_i + \delta_h Z_i + \varepsilon_{ih}$$

$$l_{ij}^* = \gamma_j X_i + \delta_j Z_i + \lambda_j I_i + \varepsilon_{ij}, \qquad j = 1,\ldots,4$$

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad , \text{with } \left(y_i, y_i^*\right) = \left(d_i, d_i^*\right), \left(h_i, h_i^*\right), \left(l_{ij}, l_{ij}^*\right)$$

$$\varepsilon_i \sim MVN\left(0, \Sigma\right)$$

Data:

- Dutch Health interview survey (1997-2000) 40+:
  - SAH: very good or good *vs* fair, poor or very poor
  - Healthy lifestyles (0,1): some exercise; not overweight (BMI<25); non-smoker; moderate drinker (<15/week);
  - Exogenous variables:
    - Age/gender groups
    - Education: primary (ref); lower secondary; middle secondary; higher secondary; higher vocational & university
    - Health: chronic conditions, longstanding illness
    - Other: region, year dummies
    - Instruments (Z, I): House ownership (Z), marital status (Z), HH size (Z), degree of urbanisation (I),

  - Mortality follow-up until 2005 (cause-of-death register)

Selected results of structural model

	Died	Good SAH	Exercise	Non-smoker	Moderate Drinker	BMI <25
Good SAH	-0.357***	-	-	-	-	-
Exercise	-0.176***	0.281***	-	-	-	-
Non-smoker	-0.389***	0.005	-	-	-	-
Moderate drinker	-0.344*	-0.205	-	-	-	-
BMI <25	0.079	0.042	-	-	-	-
Educ 2	-0.064	0.154***	0.222***	0.123***	0.087	0.077**
Educ 3	-0.102	0.351***	0.306***	0.146***	0.034	0.239***
Educ 4	-0.087*	0.238***	0.430***	0.149***	-0.131*	0.265***
Educ 5	-0.115*	0.417***	0.747***	0.359***	-0.092	0.374***

Example: unfair inequalities due to education
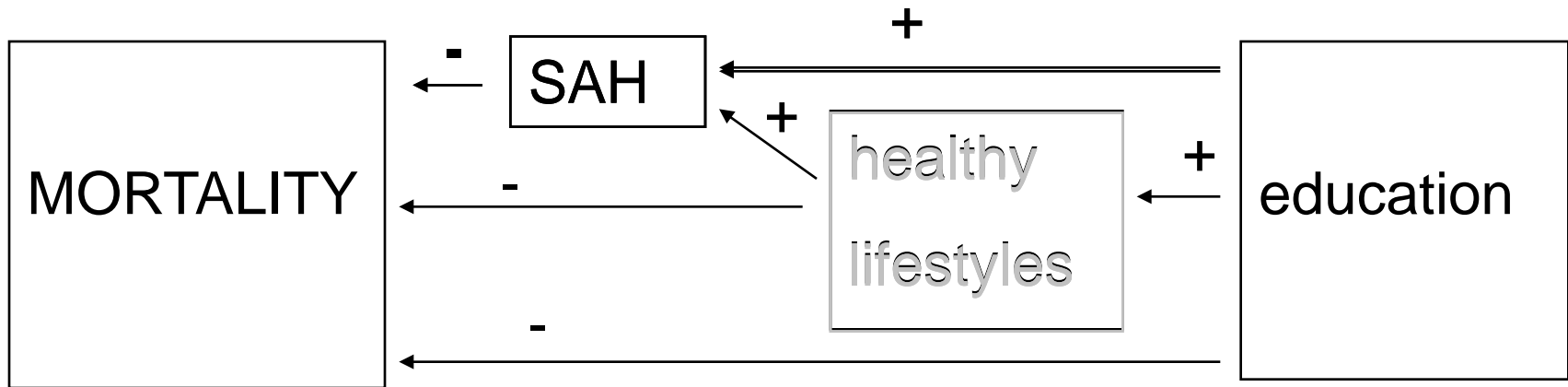
Unfair inequalities

- Egalitarian – equivalent (Fleurbaey and Schokkaert, 2009):

  - Fairness gap: $d_i^{FG} = d\left(illeg_i, leg_i\right) - d\left(illeg^*, leg_i\right)$
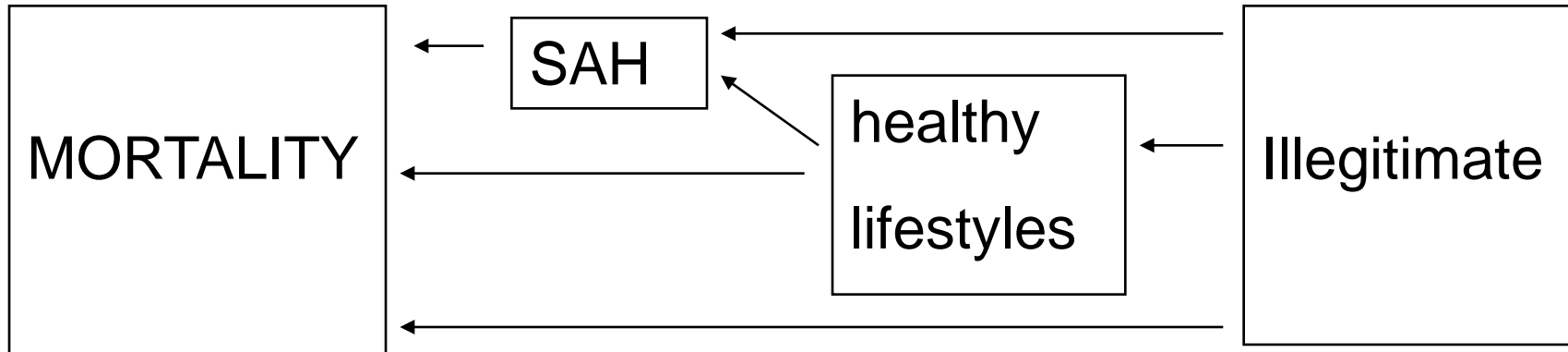
  - Unfair inequality: I(dFG)

- Modified Gini index G^* (Erreygers, 2009):

  - G^* of survival (attainment) = G^* of mortality (shortfall)

Preliminary results unfair inequalities

MORTALITY ← SAH ← healthy lifestyles ← Illegitimate

healthy lifestyles → MORTALITY

Illegitimate → MORTALITY

	Legitimate	Illegitimate	Index
1	other SES	age/sex health, education	0.119
2	age/sex	other SES, health, education	0.061
3	age/sex, health	education, other SES	0.033

Preliminary conclusions

- Unfair inequalities in mortality in the NL

- Normative choices matter

- Lower inequalities with "usual" standardisation variables

To be done

- Structural model:

  - Exploit other instruments

  - More detailed info on mortality (duration) and lifestyles

- Inequality measurement:

  - Consider other normative choices

  - Alternative standardisations: consider values other than average (eg: highest level of education)

Correlations of error terms

	Died	Good SAH	BMI <25	Moderate drinker	Non-smoker	Exercise
Died	1					
Good SAH	0.044	1				
BMI <25	-0.039	0.025	1			
Moderate drinker	0.057	0.096	0.014	1		
Non-smoker	0.080***	0.018	-0.107***	0.124***	1	
Exercise	-0.016	0.015	0.050***	0.016	0.166***	1