Intergenerational educational trajectories and early mortality from chronic diseases among Swiss middle-aged adults: A registry population-based study

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Consistent evidence of inequalities in all-cause and cause-specific mortality due to individual attained education

Experimental and quasi-experimental evidence: Galama et al, 2018; Lager and Torssander, 2013

Observational evidence: Mackenbach et al, 2016 and 2019; Huisman et al, 2015; Welsh et al., 2021

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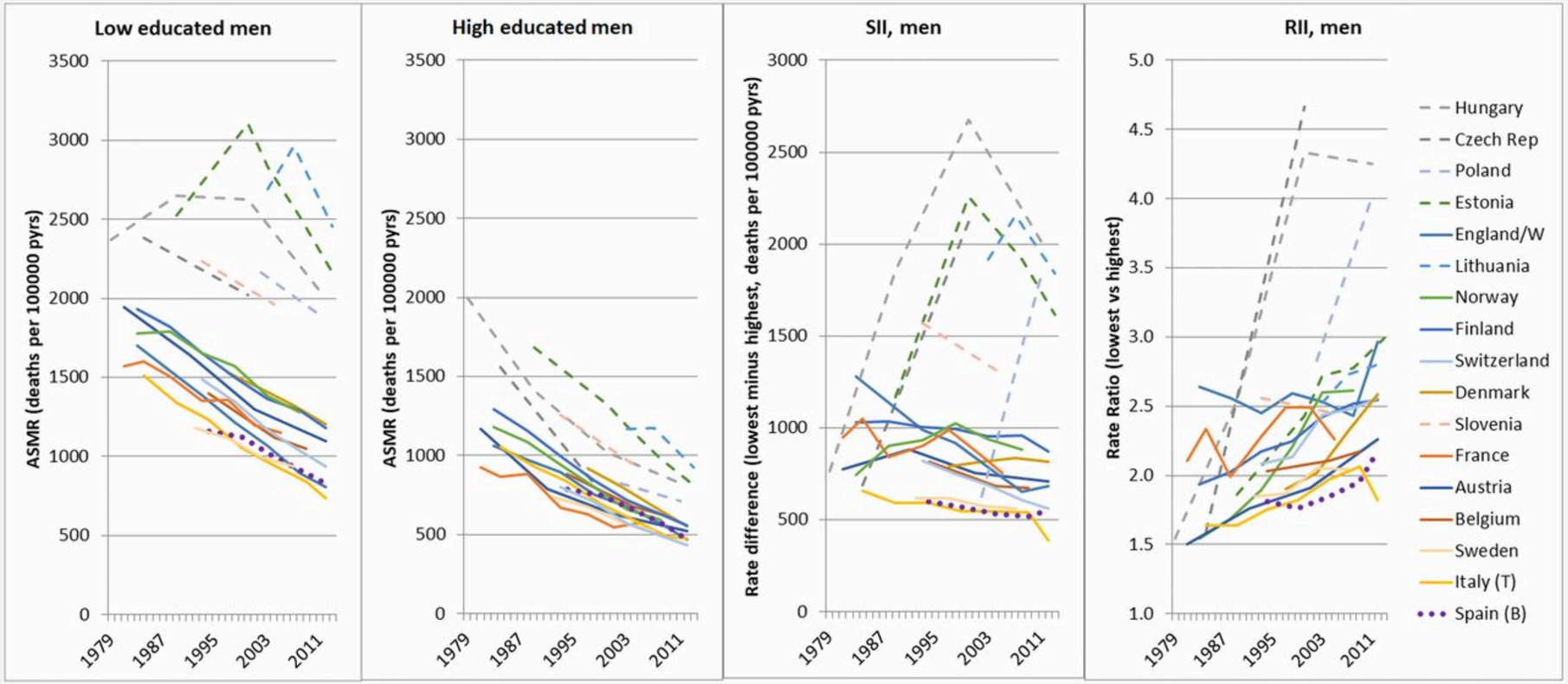
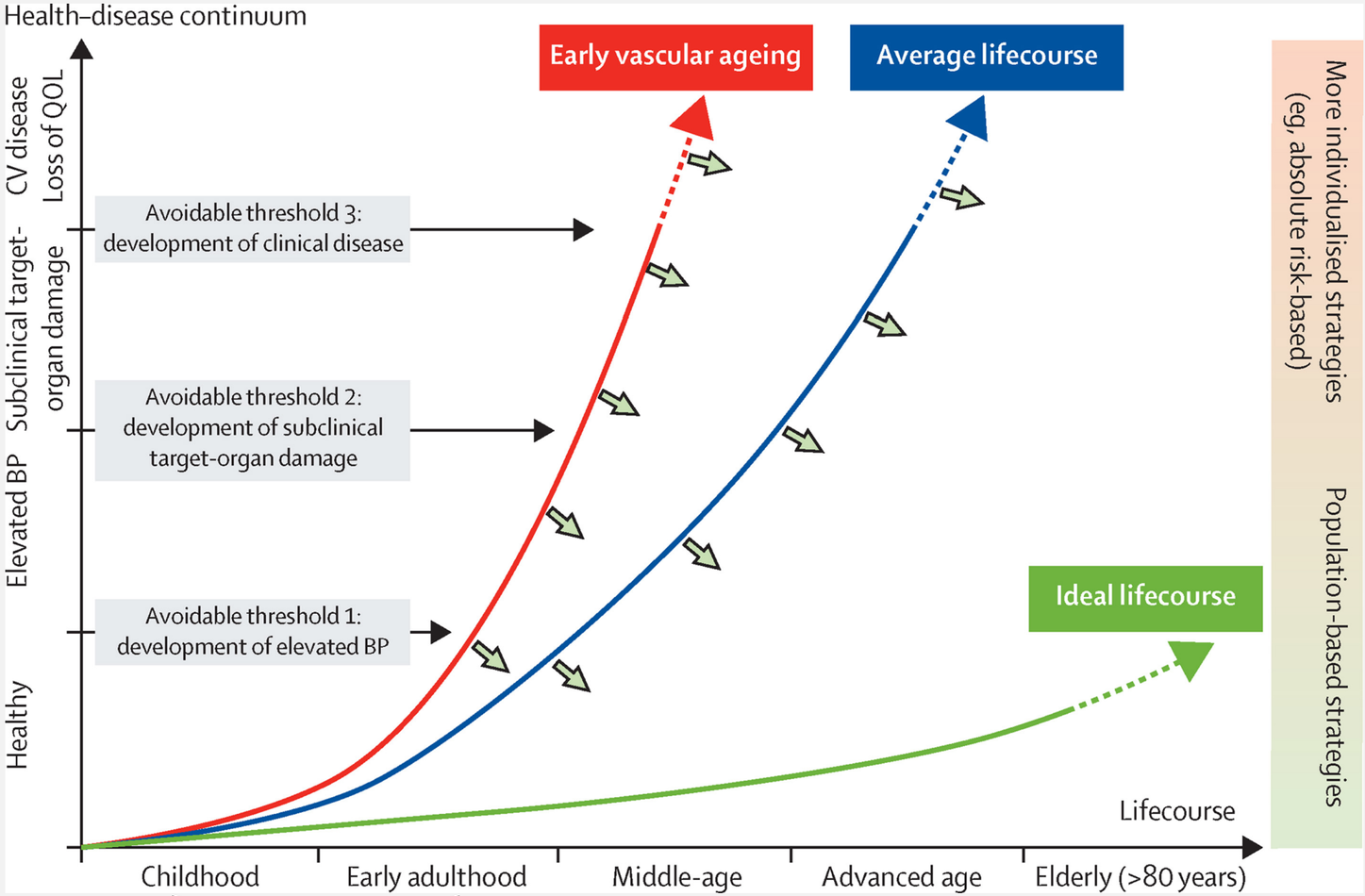
Trends (Mackenbach et al., 2019)



Life course origin of chronic diseases (CDs): how about parental education ?



from Olsen et al., 2016

Parental education

Individual education

<u>Putative mechanisms underlying the effect of parental education on mortality</u>:

Parental lifestyle behaviours

Individual education

Parenting style

Adverse childhood experiences

Intergenerational educational inequalities in CD-related mortality: what drives them ?

1. Only individual education (Theory of resource distribution; Ross and Mirowski 2011)

2. Both parental and individual edu (Theory of resource multiplication; Willson et al. 2007)

3. Direction of change between parental and individual edu (Theory of social mobility; Erikson and Goldthorpe 1992)

Intergenerational educational inequalities in CD-related mortality: our study

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  - Previous studies - Only 2 with cause-specific CD mortality, mainly from Finland and Belgium.

    - Cancer, CVD, Substance use in Finnish born <1950: Elo et al., 2014;

    - Cancer in Belgian born 1970-1980: Da Grande et al., 2014

    Summary of findings: Individual education as main driver for Cancer / Substance use
    Parental and individual edu for CVD

Data: Swiss National Cohort

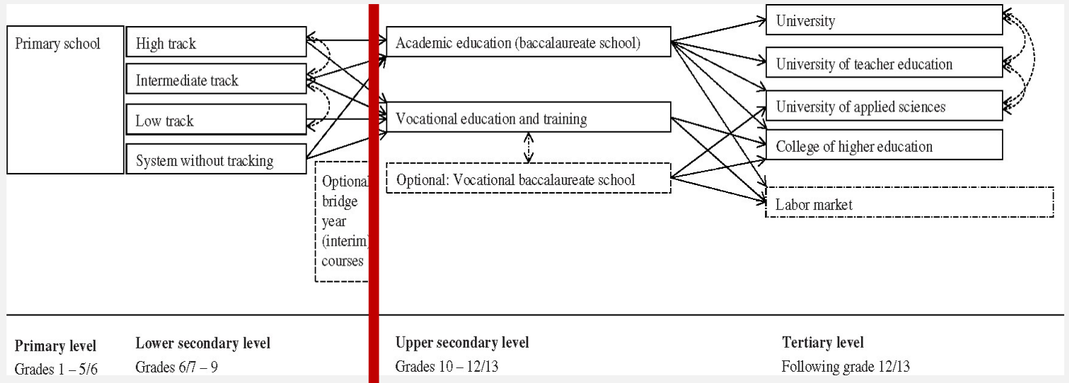
- Sociodemographic information for individuals resident in CH at 1990 and 2000 censuses
- Mortality follow-up until end of 2018

Swiss National Cohort (SNC)

- **Study population**: **Adolescents 10-19y at 1990 census, N = 544 743**.
  Individuals born 1971 to 1980. Mortality follow-up up to 38-47y of age.

Intergenerational education : exposure

Intergenerational education	Parental Edu	Individual Edu
	High	High
	High	Low
	Low	High
	Low	Low



from Burger, 2021

Low ← → High

Characteristics of study population

Characteristics	N (%)
Sex	
Men	283 761 (52%)
Women	260 982 (48%)
Household type	
Couple	488 919 (90%)
Single parent	55 824 (10%)
Country of birth of parents	
CH	429 589 (79%)
EU	78 584 (14%)
Other	36 570 (7%)
Birth cohort	
1971-1975	242 761 (45%)
1976-1980	301 982 (55%)

Characteristics	N (%)
Intergenerational education	
High-High	83 560 (15%)
High-Low	75 489 (14%)
Low-High	87 271 (16%)
Low-Low	273 484 (50%)
Missing	24 939 (5%)
All-cause mortality	7877 (1.4%)
CVD	697 (0.1%)
Cancer	1275 (0.2%)
Substance use disorders	874 (0.2%)
Other causes	5031 (0.9%)

Estimating inequalities: Methods

- Estimation of weighted cumulative incidence function per each exposure level
  - Probability of dying of a specific cause (CVD/Cancer/Substance) by a certain age

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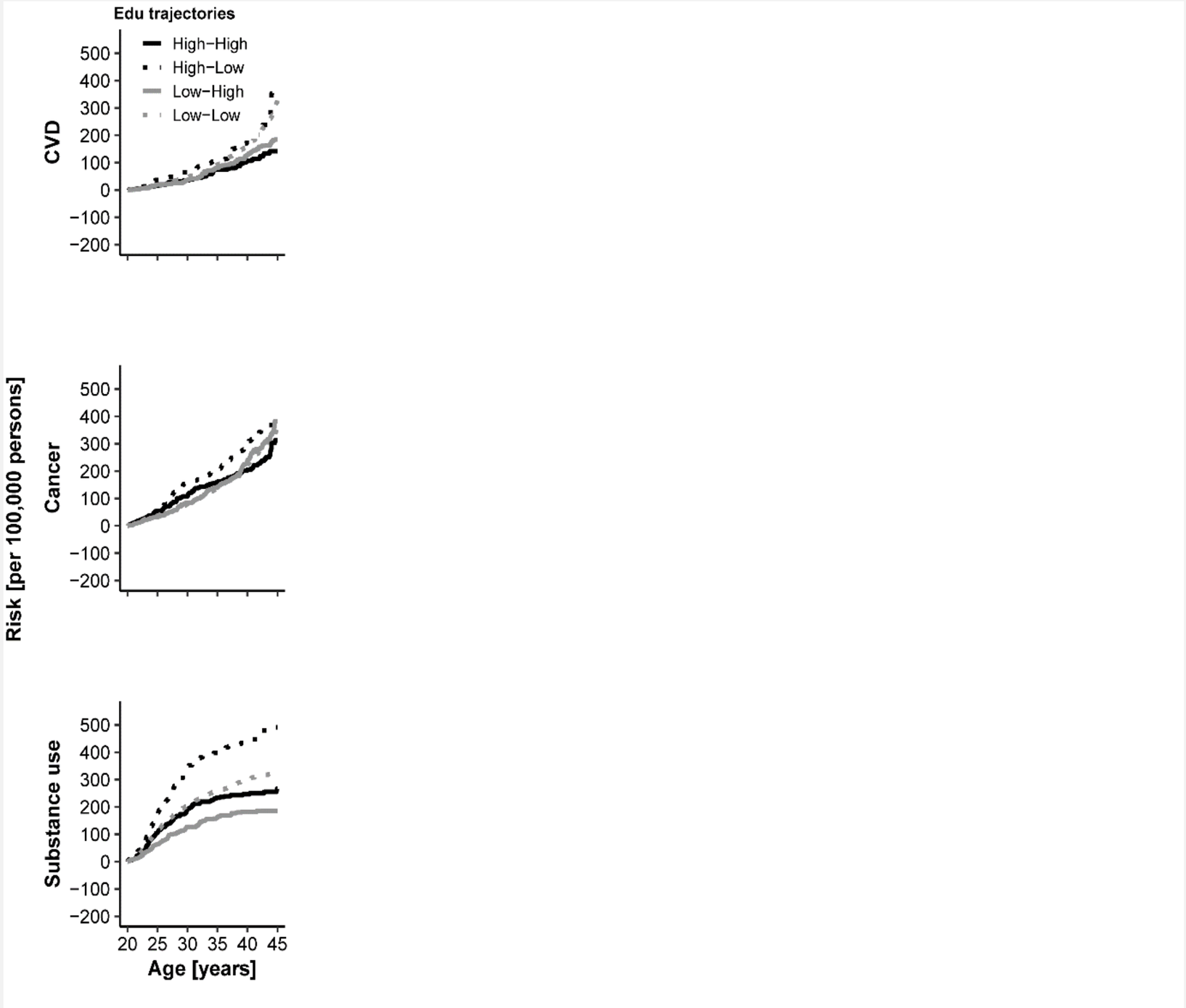
- Sex as effect modifier

Results - Men


Edu trajectories
High−High
High−Low
Low−High
Low−Low
CVD
Cancer
Substance use
Risk [per 100,000 persons]
500
400
300
200
100
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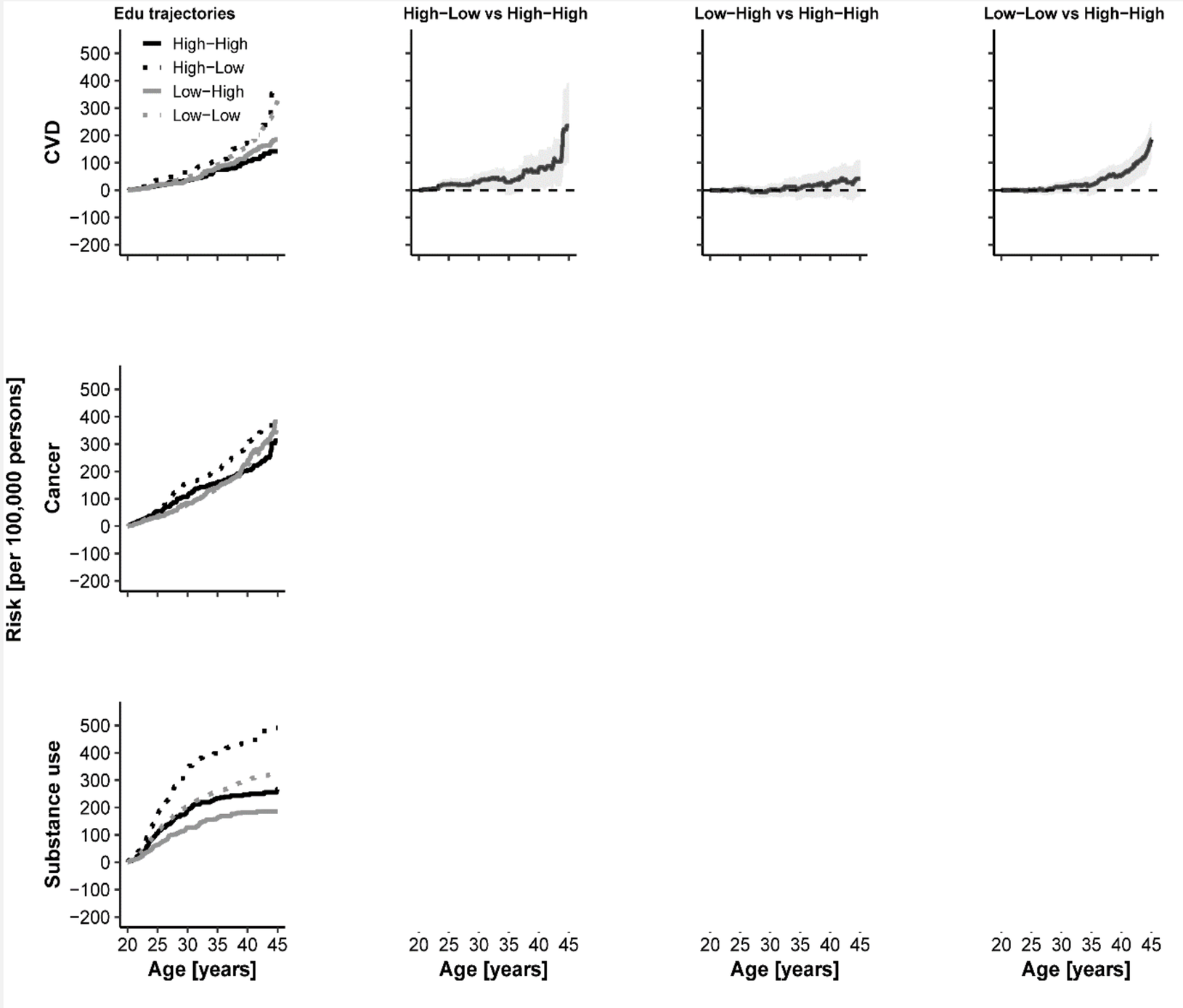
20 25 30 35 40 45
Age [years]

Results - Men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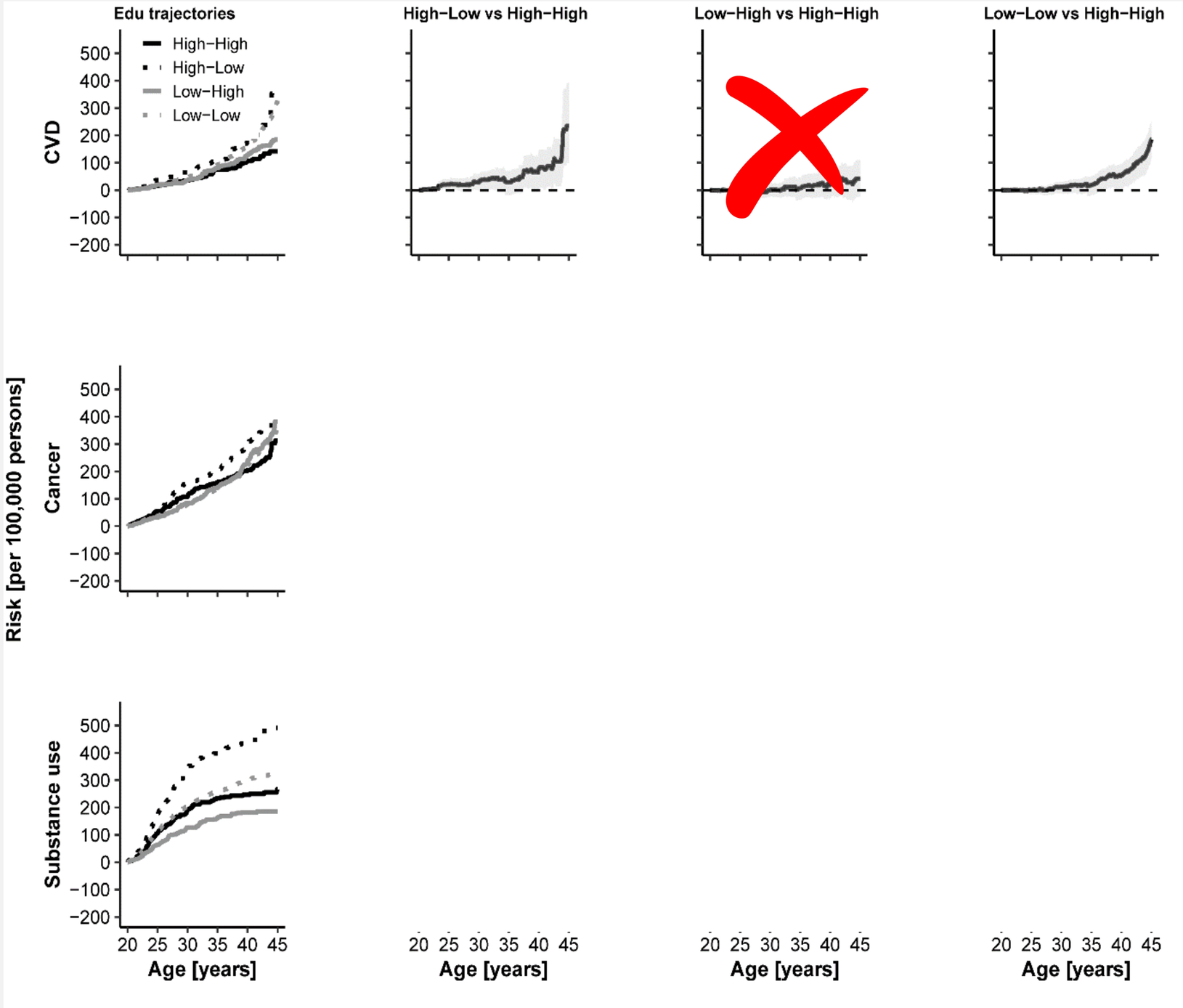
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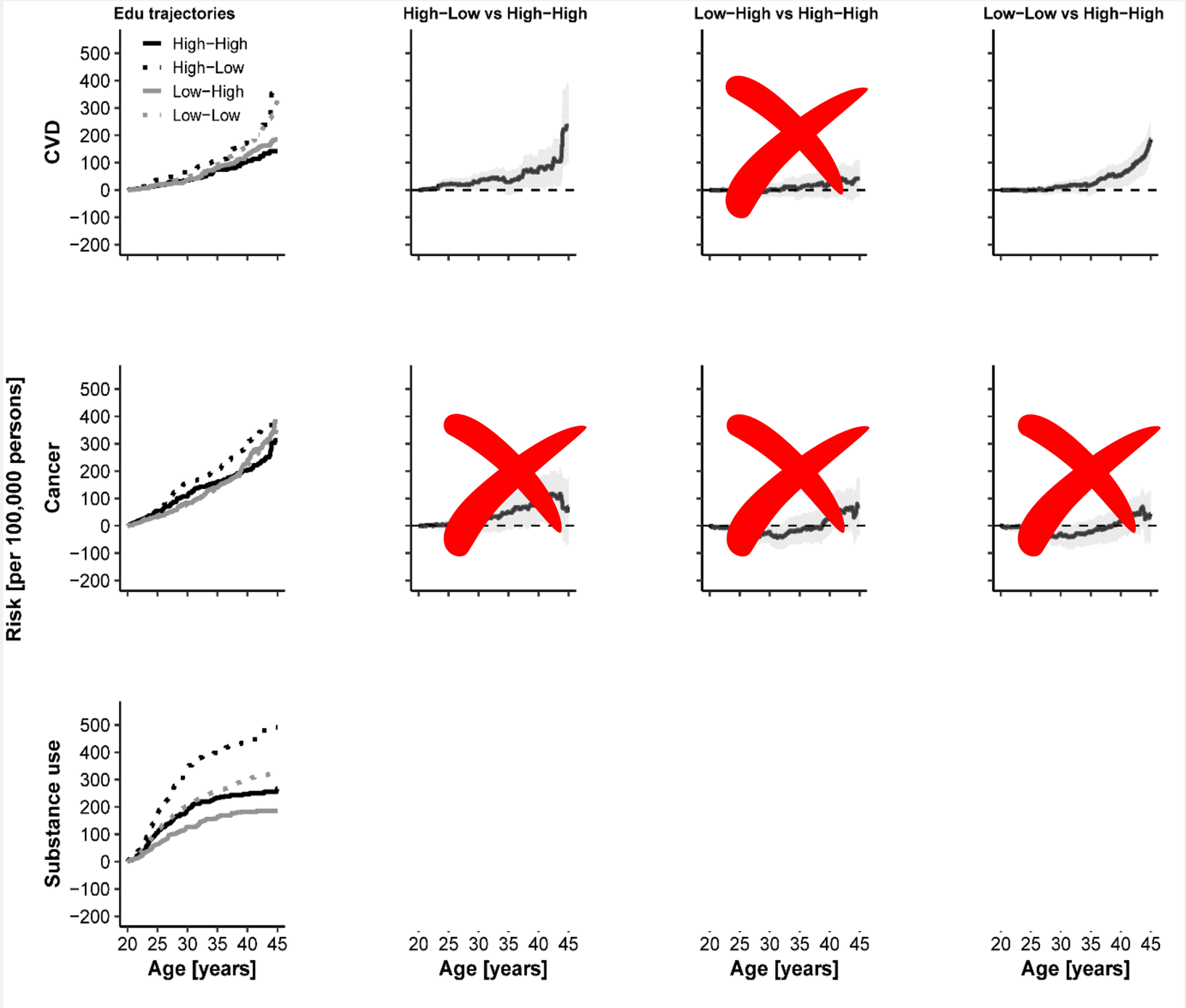
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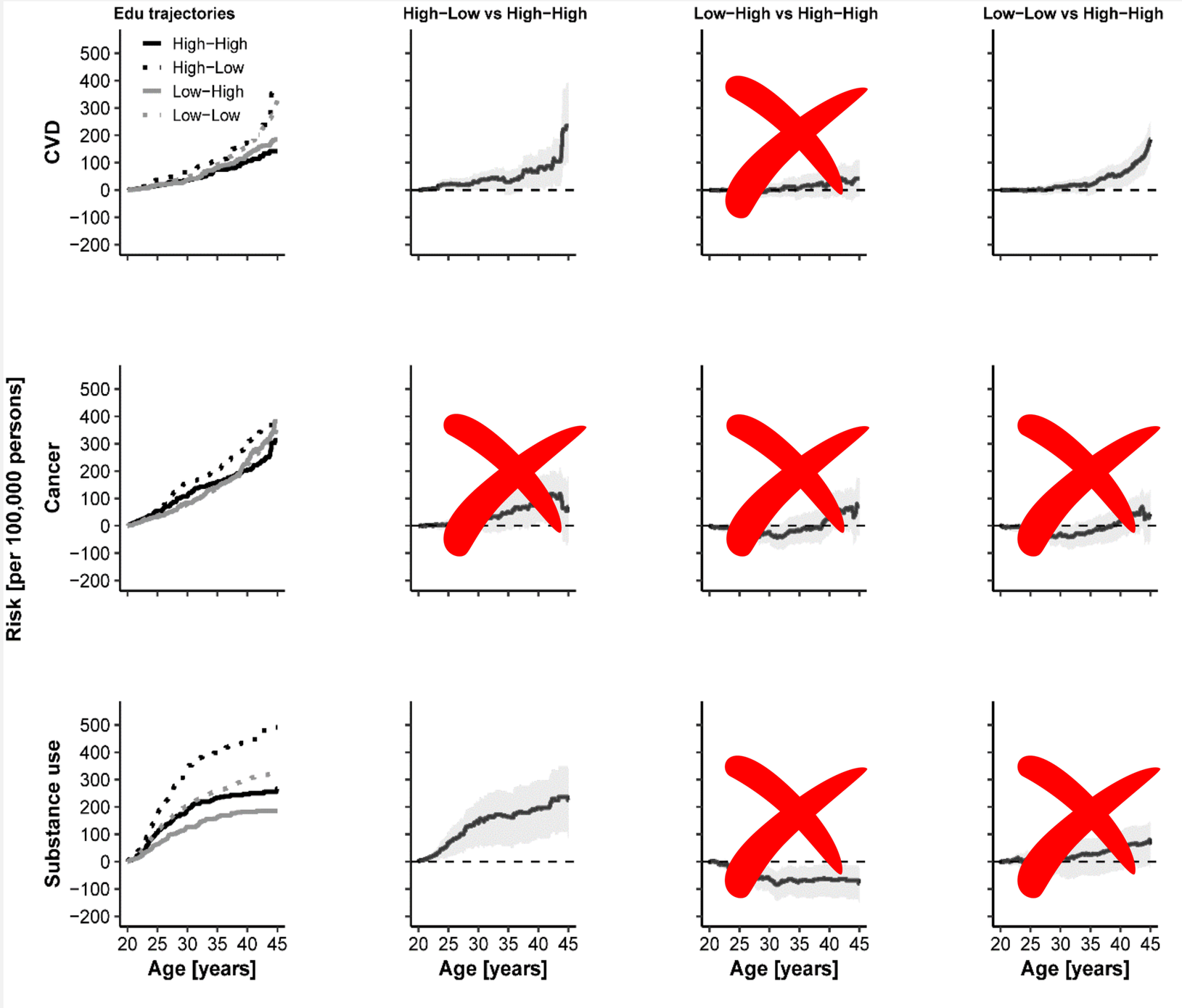
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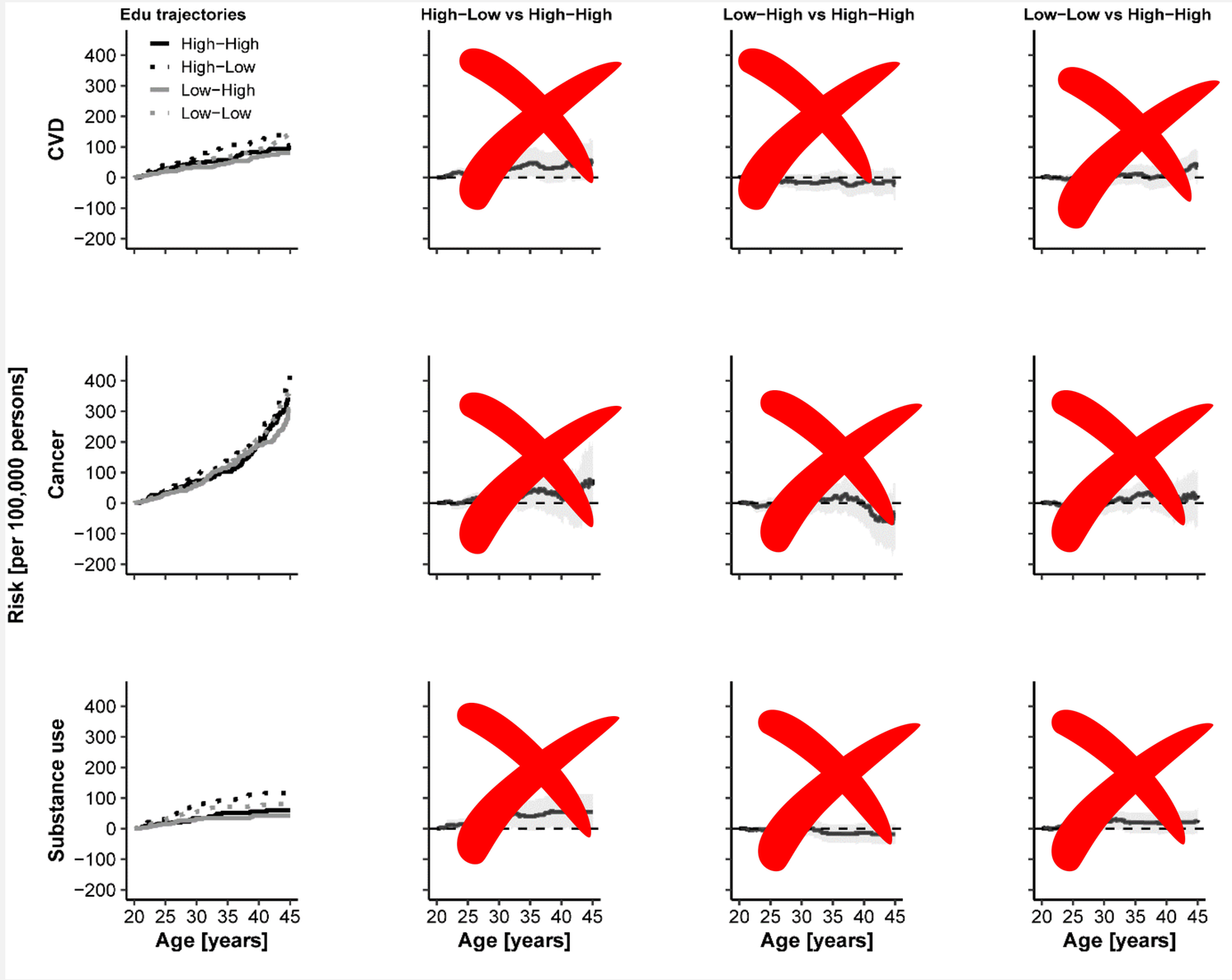

Limitations and strengths

Limitations

- Information bias from education/mortality missclassification
- Residual confounding

Strengths

- Large sample size allowing to study cause-specific premature mortality
- We estimated inequalities via marginal risk differences and not conditional hazard ratios
  - ➢ Avoid non-collapsibility and implicit selection bias of hazard ratios (Young et al., 2020)

Summary and public health consequences

- Sex- and cause of death- specific inequalities in premature mortality
- Inequalities in CVD premature mortality driven by individual education
- Inequalities in Substance use premature mortality driven by change between parental and individual edu

<u>Public health consequences</u>

- Intergenerational prevention strategies may mitigate premature mortality

Thank you for your interest

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