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The contribution of child cohort studies to child public health & practice

CHICOS – EU project & The Generation R study

ANNUAL ISSOP CONFERENCE GOTHENBURG 2014

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Overview

1. Positioning Birth cohort studies in child health research

2. CHICOS project: the future of birth cohort studies in Europe

3. Example (Generation R) for social pediatrics

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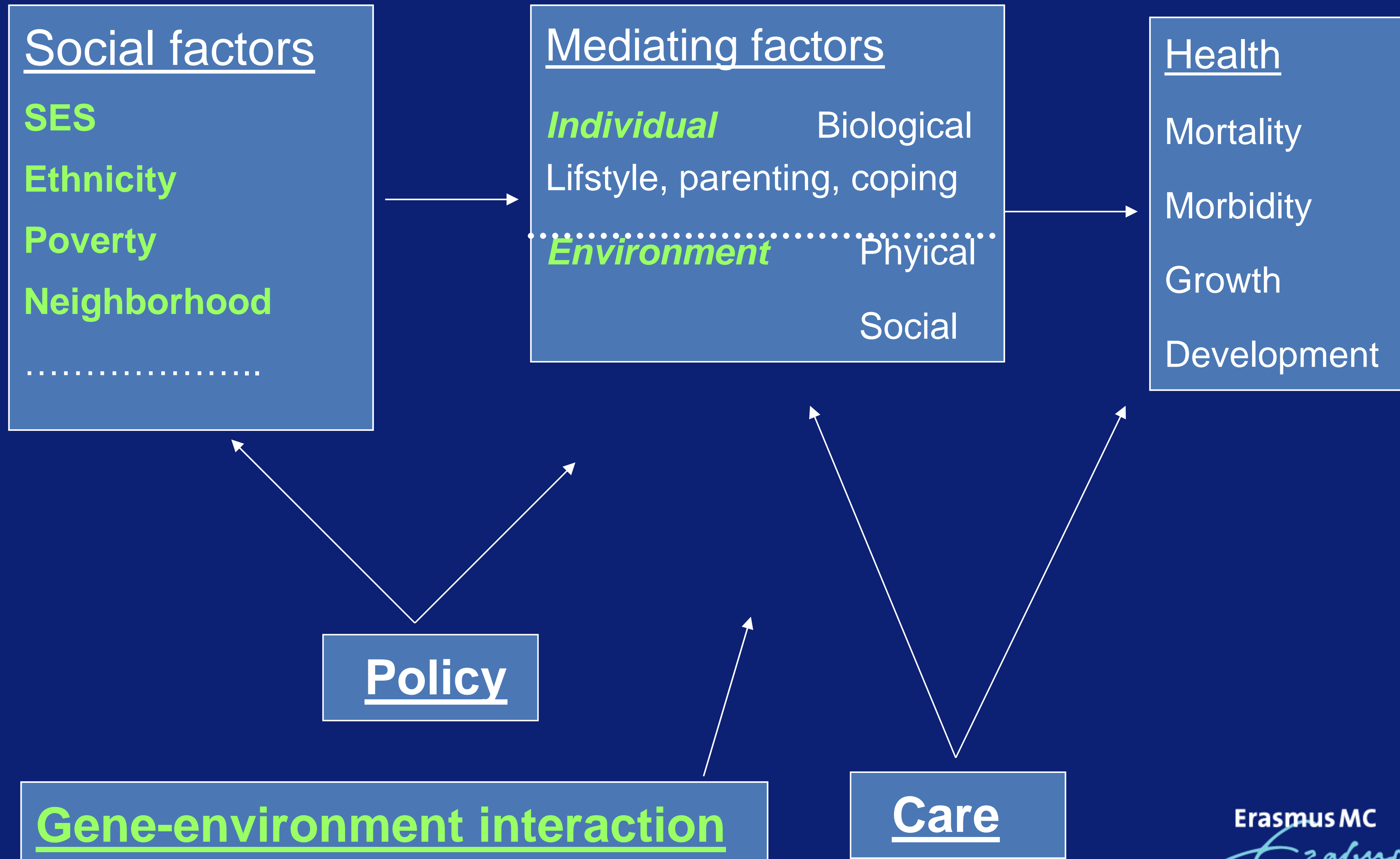
We study with the purpose to improve health-in-all
Social factors
SES
Ethnicity
Poverty
Neighborhood
…………………
Mediating factors
Individual
Biological
Lifstyle, parenting, coping
Environment
Phyical
Social
Health
Mortality
Morbidity
Growth
Development
Policy
Gene-environment interaction
Care
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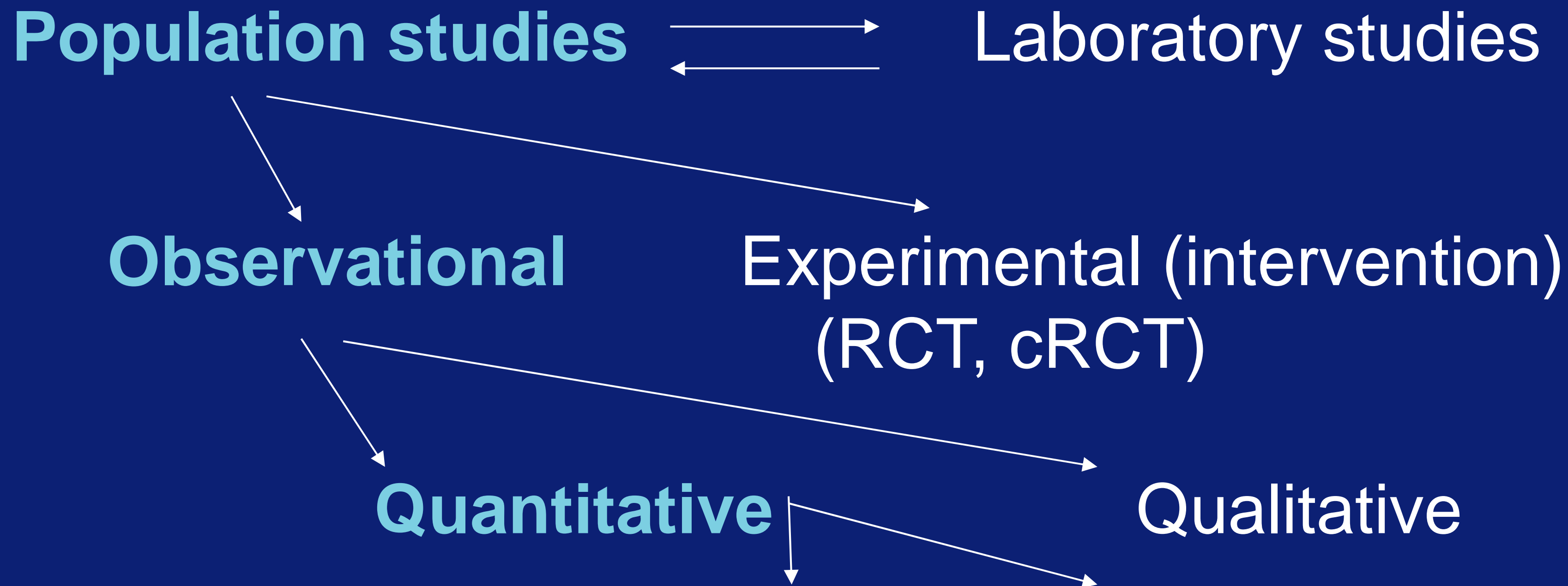
Taxonomy child health research; 5 steps!



	Cross sectional	Longitudinal
'Single' topic	Cost-efficient Fast No causal inference	In depth study Causal mechanisms
'Broad' approach	Monitoring approach HBSC; ISAAC	Child cohort studies **Birth cohort studies**

Features of birth cohorts

***Epidemic of birth cohorts** (Anne-Marie Nybo Andersen, 2013, Chicos)* *WHY? EFFICIENT & PRODUCTIVE*

1. ***Longitudinal***

   Pregnancy – adulthood → lifecourse

2. ***Prospective***

   Determinants before health outcome → causal inference

3. ***Not one topic, but comprehensive data***

   Environment, Family, Lifestyle, Individual, Psychology & Physical

4. ***Clinical measures, imaging, and body materials***

   genetics, biological mechanisms

The Role of Research Evidence for Policy
(Patricia Lucas, 2012; Chicos)

1. Achieve recognition of a policy issue (**advocacy**)
2. Inform the design and **choice of policy**
3. Forecast the **future**
4. **Monitor** policy implementation
5. **Evaluate** policy impact

Child cohort studies may contribute to: 1 + 2

(and sometimes contribute to 4 + 5)

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Related initiatives

- International Network for Research on Inequalities in Child Health (INRICH)
- **CHICOS EU network of child cohorts**
- RICHE EU research network child health

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CHICOS: *http://www.chicosproject.eu/*

a. Inventory and review of birth cohort data in Europe

- Cohorts
- Determinants
- Outcomes

b. Pooling of cohort data (meta-analyses)

c. Contribution to policy

d. Stakeholder involvement

Recommendations

Identification of birth cohorts

Cohort details	No. of cohorts
Identified cohorts in Europe	72
Update of cohort profile	61
Eligible cohorts	54
European children enrolled	503,844
Multi-disciplinary cohorts	21

Paediatric and Perinatal Epidemiology, 2013, **27**, 393–414

Birthcohorts.net

Anne-Marie Nybo Andersen

CHICOS: Delphi consultation

Aims: Information needs of cohort researchers and policy makers regarding disease outcomes, health determinants and the combination of risk factors

A. Inventory of opinions on priorities in child health research/cohort research (Round 1 and 2)

B. Round 3 of the Delphi as an 'intervention' to promote level of consensus among experts

C. Experts are those in research and those involved in policy at EU or national/regional level

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Results Delphi

I. Broad set of relevant topics identified for child health policy at European and national level

a. Prevalent conditions

b. Physical, mental and social domains

c. Poverty & social inequalities in health

II. Policy makers generally gave higher scores than researchers

III. Results of round 1, 2 & 3 suggest that it concerns priorities of child health research **in general**, including child cohort research

Other types of research may also be needed to inform child health policy (e.g. RCTs to evaluate interventions)

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Generation R Birth Cohort Study

- Inclusion in early pregnancy: 2002-2006
- Almost 10.000 included
  - Antropometric, biomedical measures, tests
  - Biobank
  - Self-report questionnaires
  - Genome Wide Screen (500.000 markers)

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Example: Generation R Birth cohort study

Do health inequalities at the end of life, have their origin in early life, or even in previous generations?

a. When do inequalities start?

b. What processes play a role (sensitive periods; programming, gene-environment interaction)?

c. What can be done about it?

Programming

Prenatal period

Childhood → Adulthood

Social inequalities in health

Gene-environment interactions?

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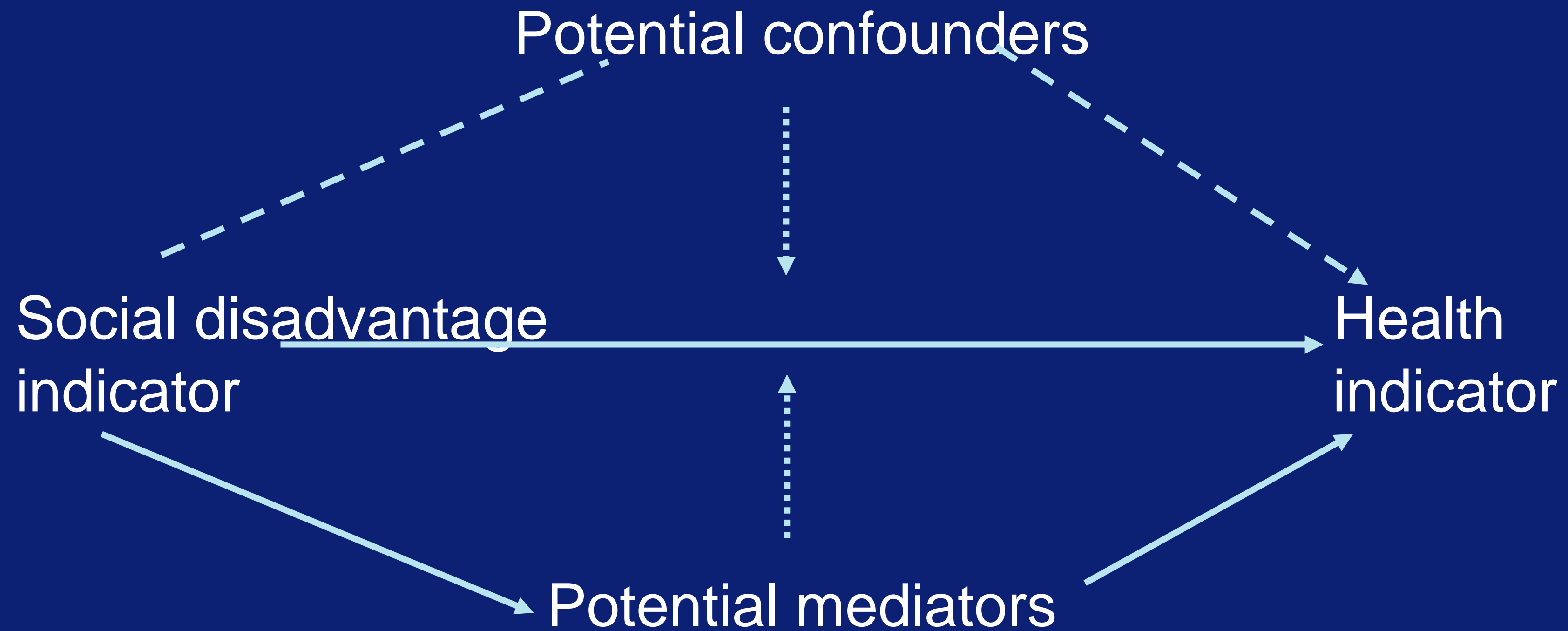
Relevance

- Ethical (advocacy; politics)
- Societal and economic gains
- Effectiveness of public health strategies
- May provide insight in causal mechanisms

Our model



Hierarchical model (Victora et al. Int J Epidemiol 1997)

Outcomes studied for inequalities in health, so far

- Prenatal (Silva, Bouthoorn)
  - Blood pressure (3 measures)
  - Hypertension
  - Preeclampsia
  - Gestational diabetes
  - Fetal growth
- Perinatal (Troe, Silva, Jansen, van Rossem)
  - Birth weight
  - Preterm birth
  - Breast feeding (start)
- Postnatal (Silva, Jansen, van Rossem, Hafkamp, Flink, Bouthoorn, Wijtzes)
  - Length; **BMI, overweight**
  - Infections, asthma related symptoms
  - Temperament and emotional and behavioral pr
  - Breastfeeding and other lifestyles

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Overview : education level – pregnancy outcome

1. Pre-term birth < 37 weeks
   - N=184 (4.8%)
   - Low education OR= 1.9
   - Mediators: various factors fully explain (OR=1.1)
     - Pregnancy characteristics, anthropometrics, psychological and material situation, lifestyle related factors

2. Birth weight
   - Low education, adj for gest age: -128 grams
   - Mediators: various factors; -66%
     - Pregnancy characteristics, anthropometrics, psychological and material situation, lifestyle related factors

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Mother's health in pregnancy: education level

1. Gestational hypertension
   - N=188 (5.3%)
   - mid-low education OR= 1.5
   - Mediators: alcohol, BMI, blood pressure early prgn

2. Preeclampsia
   - N=51 (1.5%)
   - Low education OR= 5.1
   - Mediators: hardly

3. Gestational diabetes
   - N=71 (0.9%) (whole cohort)
   - mid-low education OR= 3.5
   - Mediators: mostly BMI

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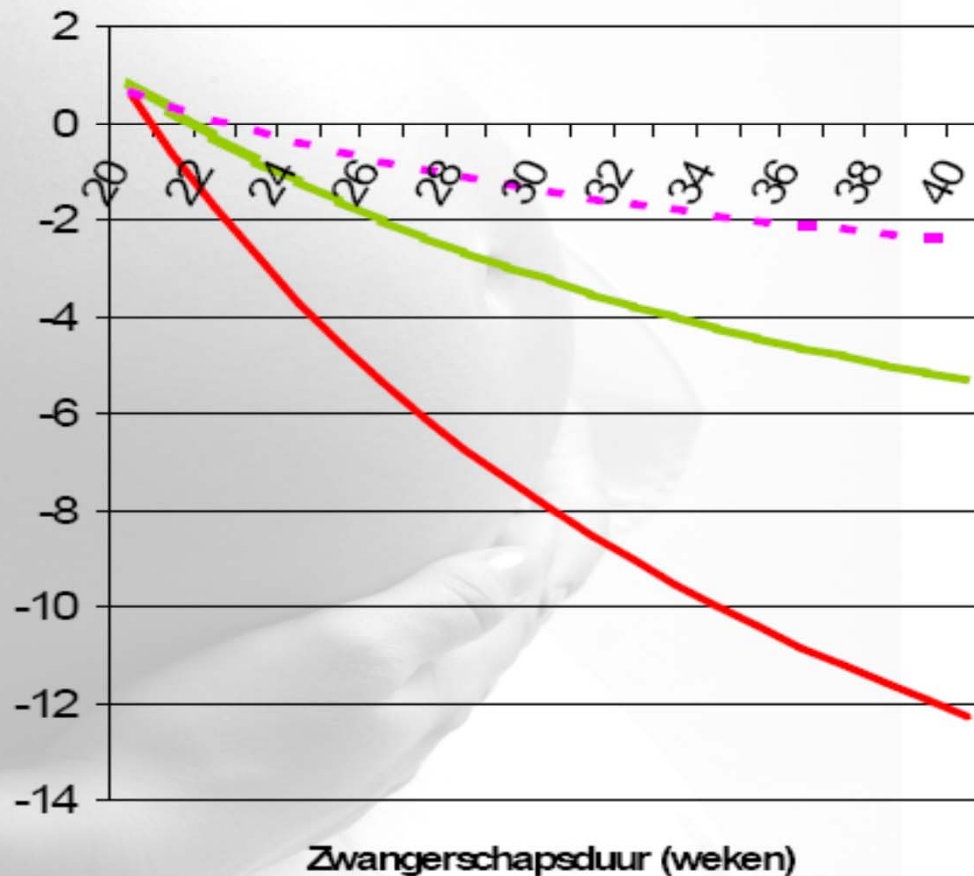
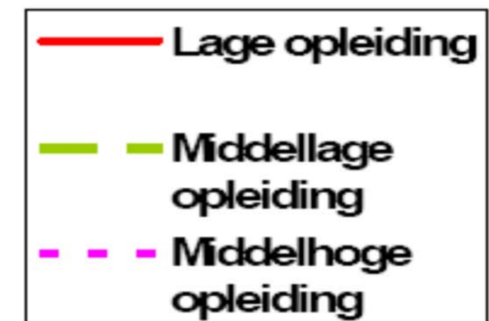
Example: Educational differences fetal growth

SES en foetale groei





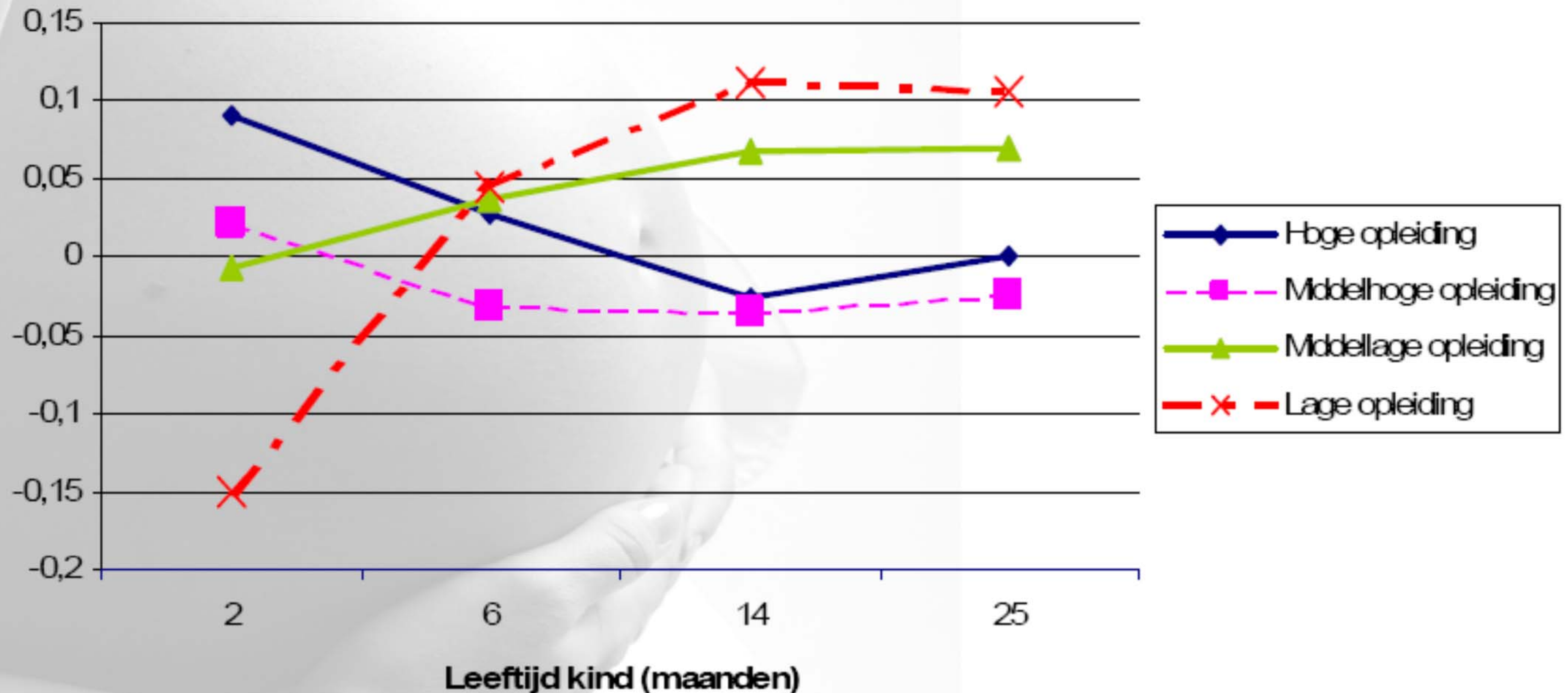
2 oktober 2009

Lindsay Marisia Silva

Postnatal growth (height): educational differences

SES en lengte(groei)

Lengte (in standaard deviatie score)



Discussion

1. Birth cohort studies important source in child health research, policy and practice

- Causal pathways of frequent conditions
- ‘Programming’ mechanisms
- Pathways of health impact of social disadvantage
- Future: gene-environment interaction

2. CHICOS project: Insight in all available cohorts, data, and variables; more collaboration

3. Example: Generation R of relevance for social pediatrics, especially inequalities in health

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