Causal pathways to sexual health in orphans: an example of the use of theoretical frameworks in social epidemiology

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Lecture plan

1. Background:
   - Social epidemiology
   - Theoretical frameworks in HIV research
   - Hypothesis development & testing
2. Worked example: orphanhood & HIV risk
   - Theoretical framework
   - Hypothesis development
   - Analysis & findings
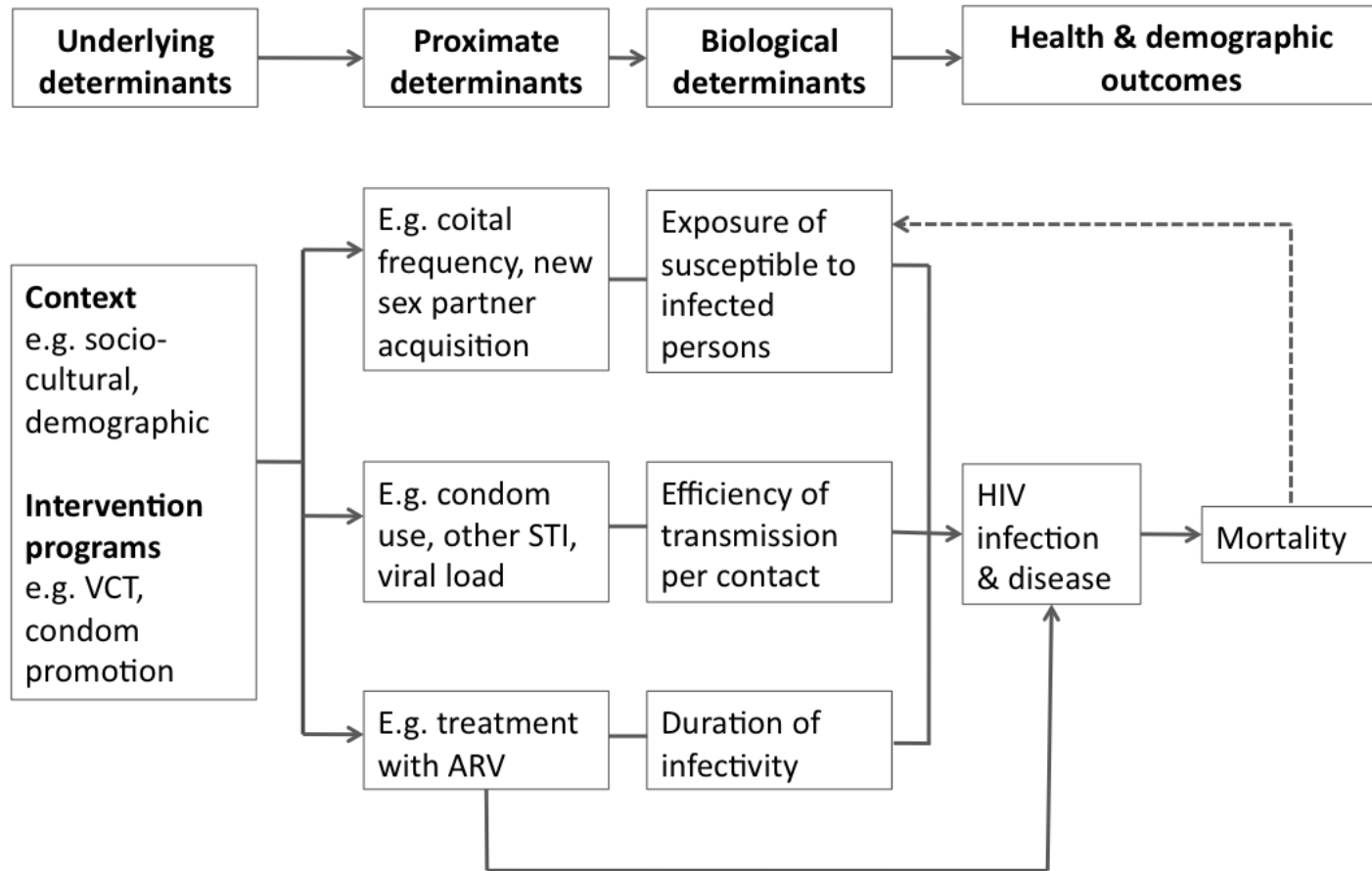3. Summary

Background

Social epidemiology

Social epidemiology is "the study of the distribution of health outcomes and their social determinants"

Poundstone, Strathdee & Celentano (2004)

The determinants are "features of and pathways by which societal conditions affect health"

Krieger (2001)

Proximate determinants framework Boerma & Weir (2005)

Proximate determinants provide a link between underlying social/environmental determinants & biological determinants of risk of HIV infection
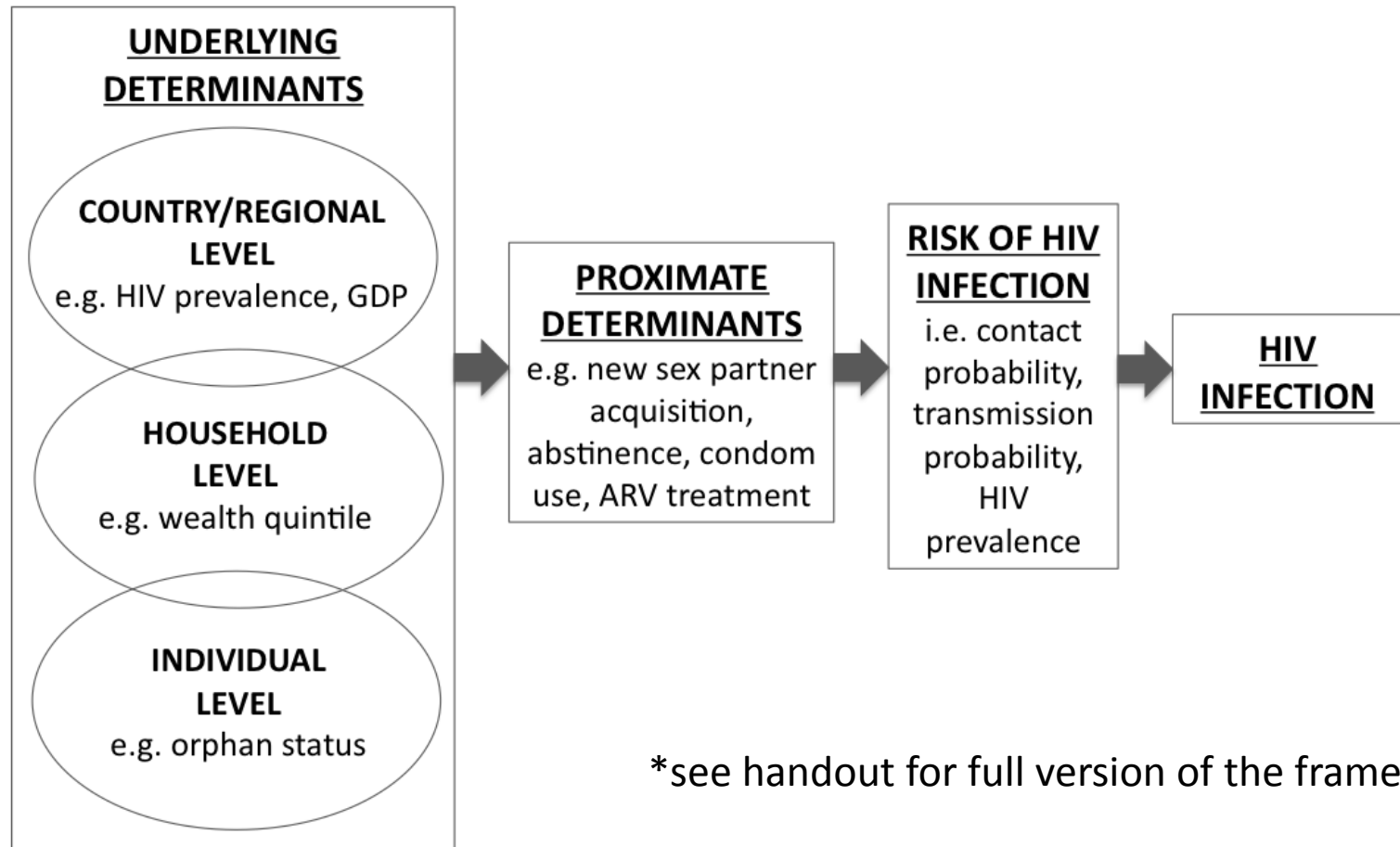
Theoretical frameworks: social epidemiology

- **An ecosocial approach (Poundstone, Strathdee & Celentano (2004))**
  - "Factors at multiple levels – from the microscopic to the societal" contribute to the distribution of HIV
  - "HIV/AIDS risk is "embodied" among persons over lifetime exposure to numerous biologic and social factors"
- **Socioeconomic determinants of child survival (Mosley & Chen (1984))**
  - Socioeconomic determinants operate through proximate determinants of child survival (e.g. nutrient deficiency)
  - Socioeconomic determinants are grouped into three broad categories:
    - Individual level (e.g. orphan status)
    - Household level variables (e.g. income/wealth)
    - Community level variables (e.g. health system)

Theoretical frameworks & hypothesis testing

- A hypothesis is a proposed explanation for an observed phenomenon.

- In epidemiology, we are interested in the causal pathway between various risk factors & health outcomes.

- Theoretical frameworks provide a visual representation of our assumptions regarding the causal structures underlying disease risk.

- They help facilitate the development of explicit hypotheses regarding the causal pathways between risk factors & disease.

- We can then use epidemiological data & statistical methods to test these hypotheses.

Example: orphanhood & HIV risk in adolescents

Theoretical framework*

*see handout for full version of the framework

We expanded the proximate determinants framework to make more explicit the country/regional, household and individual level, underlying determinants of HIV

Literature review & hypothesis

- **Literature review**
  - A study of data from across sub-Saharan Africa has shown that in some countries female, orphaned adolescents are at increased risk of starting sex compared to non-orphans. In other countries this was not the case.
  - Adult mortality & orphan prevalence are higher in countries with higher HIV prevalence, which puts stress on the extended family that traditionally cares for orphaned children.
  - Orphans in South Africa (high HIV prevalence) experience stigma & psychosocial distress. Psychosocial distress has been shown to explain some of the increased sexual risk amongst female orphans in Zimbabwe (high HIV prevalence).
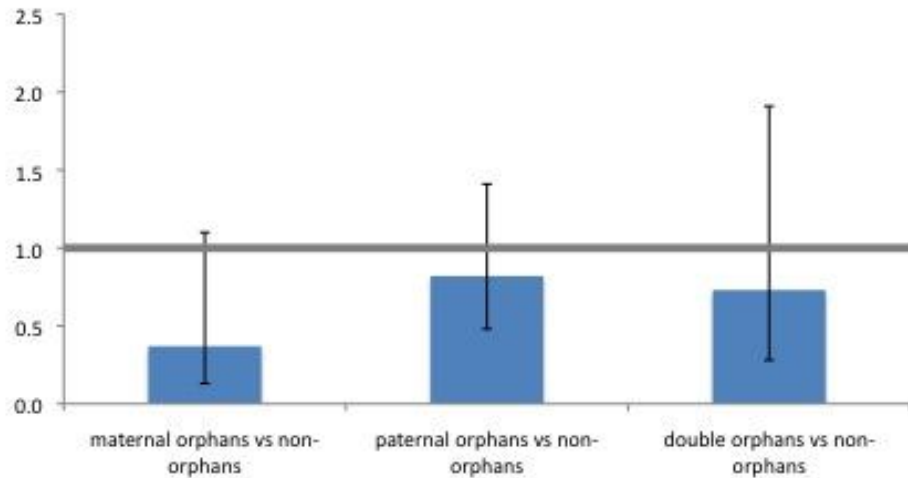
- **Hypothesis**
  - In countries with high HIV prevalence, female, orphaned adolescents will experience increased risk, compared to non-orphans, of starting sex. This increased risk will be reduced in countries with low HIV prevalence.

Palermo & Peterman (2009); Bicego et al (2003); Hosegood et al (2007); Monasch & Boerma (2004); Cluver et al (2006, 2008); Nyamukapa et al (2008)
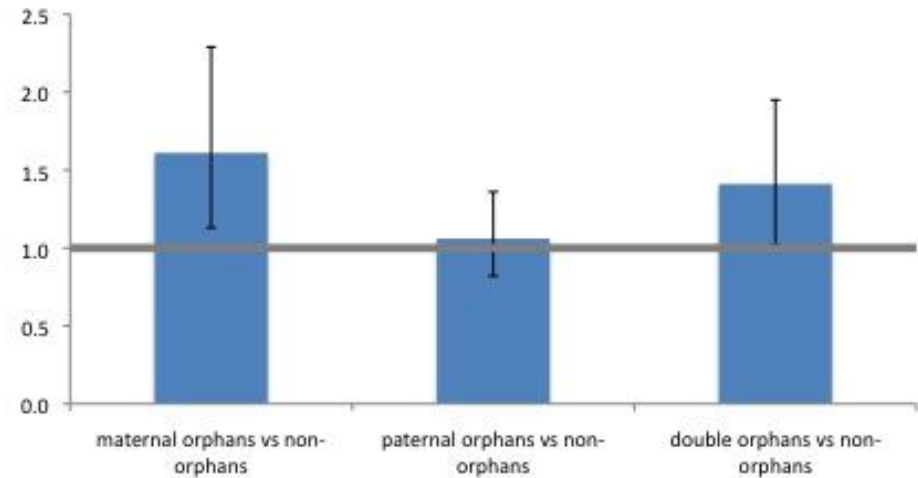
Analysis & findings

Odds ratios for starting sex comparing orphaned and non-orphaned female adolescents aged 15-17 years stratified by country-level HIV prevalence

- Data on female adolescents aged 15-17 years collected in nationally representative, cross-sectional demographic surveys from 9 countries in sub-Saharan Africa.

- Country-level data were stratified by HIV prevalence & the pooled data were analysed using hierarchical statistical modeling techniques.

- In countries with high HIV prevalence, maternal & double orphans are at significantly increased risk of starting sex but in countries with low HIV prevalence, orphans are not at increased risk.

Summary

- Social epidemiology is the study of the distribution of health outcomes and their social determinants.

- Theoretical frameworks provide a visual representation of our assumptions regarding the causal structures underlying disease risk.

- They help facilitate the development of explicit hypotheses, which can be tested using epidemiological data and statistical methods.