

**BIAS IN CROSS-SECTIONAL COHORT STUDIES ON TIME TRENDS IN FERTILITY**

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**Objectives** Different designs have been used in studies on time trends in fertility, that is, the capacity to conceive and deliver a baby. In some designs, the study populations do not represent the biological fertility of the underlying birth cohorts. We examined the potential for bias in studies that used the cross-sectional cohort design.

**Methods** We illustrate potential bias in a study restricted to nulliparous women, at a cross-section of time, who subsequently gave birth during the next 20 years. To assess the strength of the bias we included demographic and birth statistics, and exploited findings on parity and fecundability.

**Results** Highly fertile women from the oldest birth cohorts are underrepresented in this cross-sectional cohort study, because reproductive capacity is reportedly related to parity. In contrast, highly fertile women in the youngest birth cohorts are overrepresented, because they are more likely to reproduce during the study period than their less fertile counterparts. These two selection forces cause bias towards an increase in fertility over time. We assessed that the magnitude of the bias could be about 20–40%, that is, comparable with the fertility increase in the study.

**Conclusions** A cross-sectional cohort design, in particular when based upon nulliparous women, is invalid for studies of fertility over time. Studies focusing on cohort effects should define study populations solely as birth cohorts or as representative samples from them. The proposed bias may also have implications for associations in occupational studies if reproductive history differs between the exposure groups.