

## **Health equity: a lifecourse approach**

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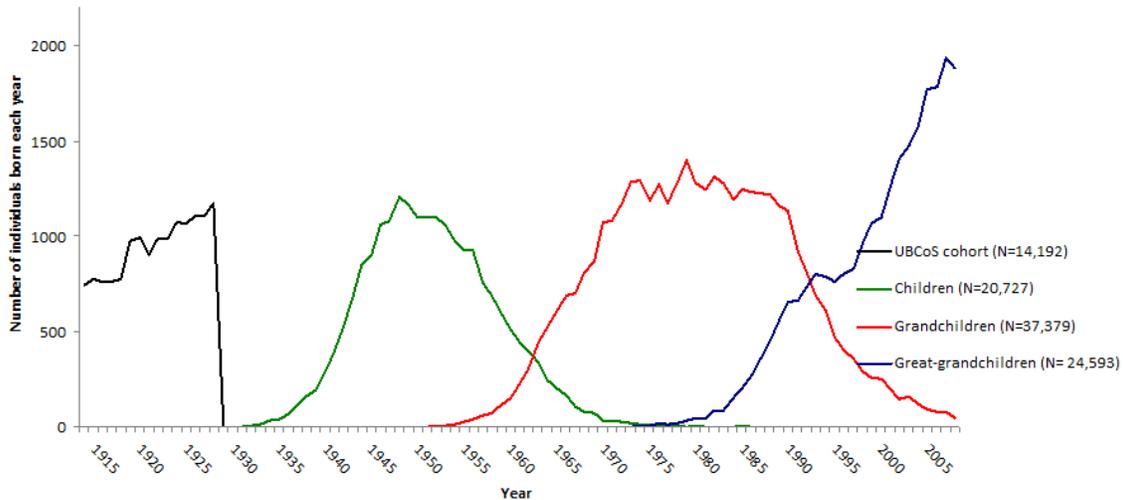
## **Health equity in a lifecourse perspective**

Despite extensive, long-term investments into reducing differences in health between social groups, substantial health inequalities persist in Sweden today. Both at a country level and internationally, a lifecourse perspective provides a particularly promising framework for conceptualising the processes whereby health inequalities arise and are reproduced across generations. This includes allowing one to identify early-life factors that affect long-term health because they add to the cumulative damage to biological systems, act during critical or sensitive periods of growth and development, or are part of social, biological, or psychological chains of risk (Kuh et al. 2004)

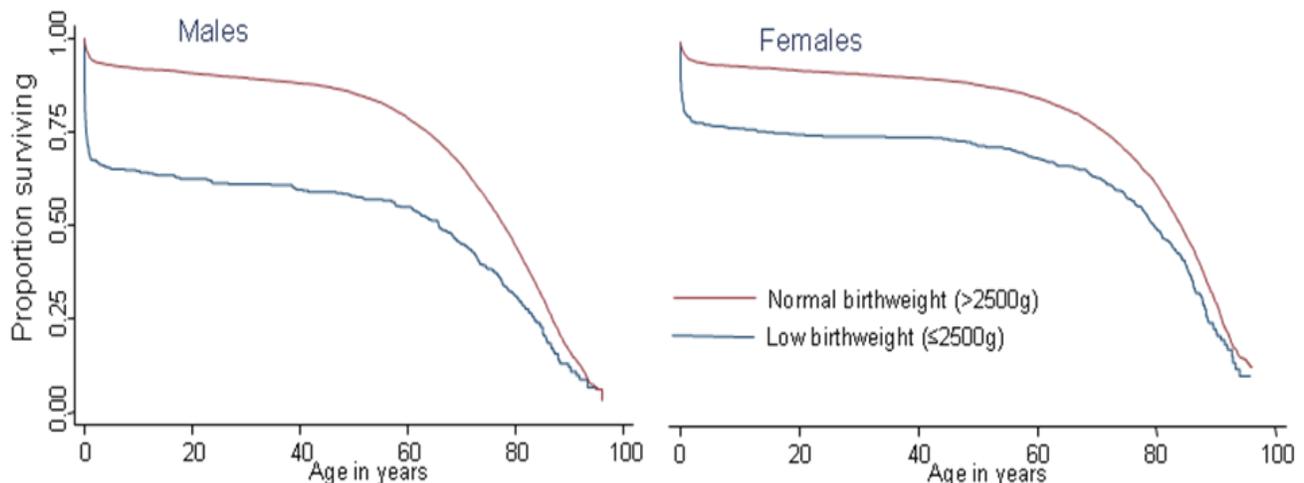
We believe that understanding such pathways can be crucial in developing more effective interventions and policies to tackle health inequalities. Understanding the mechanisms whereby adverse parental (and grandparental) socioeconomic position translates into social and health disadvantage in subsequent generations can help one design policies to interrupt this process. Moreover there is growing evidence that biological and social characteristics can interact, such that the negative impact of biological risks (e.g. preterm birth upon lower cognitive ability) can be mitigated by a positive social environment (e.g. high parental education: Gisselmann et al. 2010). These interactions illustrate that ‘biology is not destiny’, and highlight particularly important targets for health equity interventions (e.g. enriching the early educational environment of children from disadvantaged backgrounds). Longitudinal studies with prospective social and biological information collected in childhood and adulthood are needed to test these models.

## **The Uppsala Birth Cohort Multigenerational Study (UBCoS Multigen)**

The starting point for the Uppsala Birth Cohort Multigenerational Study (UBCoS Multigen) was a representative and well-defined cohort of 14,192 males and females born in Uppsala University Hospital from 1915-1929 (the Uppsala Birth Cohort Study or UBCoS: Leon 1998). In 2004 we were able for the first time to combine this original cohort with social and health data on all their descendants, obtained from routine registers (Koupil 2007). In 2007-2011, the data set was further developed by additional data manually collected from church parish records, school archives and records from Census 1930 and the period of follow-up was extended till end of year 2009/2010. The resulting multigenerational study spans five generations and comprises nearly 140,000 individuals on cohort members, descendants and partners (Figure 1).

**Figure 1: Four generations of UBCoS Multigen; number of subjects by year of birth**

The uniqueness of UBCoS Multigen and the originality of our proposed research stems from this combination of routine registry data (available in Sweden since 1960) with manually collected information stretching back to 1915. In this way, we are able to follow our first generation of men and women from before birth till age 80-94 years. This makes UBCoS Multigen ideally suited for testing lifecourse models, particularly those connected to 'developmental origins of disease', that is the way in which adult disease risks are influenced by environmental processes during periconceptual, foetal and infant phases of life (Gluckman et al. 2009). For example, in Figure 2, we illustrate how size at birth of our first generation men and women was related to their risk of death across the lifecourse, from infancy to age 80-94 years - a longer follow-up period than available from any other study.

**Figure 2: Effect of low birth weight on mortality across the lifecourse in UBCoS Multigen cohort members born 1915-1929**

UBCoS Multigen also allows us also to perform more complex analyses relating grandparents' social background, maternal characteristics, birth size, school performance and morbidity and mortality to the birth size, growth, educational and health outcomes in their grandchildren and great-grandchildren. For example, we have recently shown that grandparent and grandchild size at birth are correlated and that this at least in part reflects shared social environments (De Stavola et al. 2011). We have also shown that early-life biological and social disadvantage in our original cohort members predicts their school achievement and educational continuation, and that this in turn predicts the socio-economic position of their children and the school outcomes of their grandchildren (Goodman et al. 2010). For a full list of UBCoS Multigen publications please see the web site [www.chess.su.se/ubcosmg](http://www.chess.su.se/ubcosmg).

### **The UBCoS Multigen study team**

The study builds upon a long-term collaboration between the Uppsala and Stockholm Universities in Sweden and the London School of Hygiene and Tropical Medicine (LSHTM) in the United Kingdom. Since 2004, the extension of the original UBCoS cohort (Leon 1998) to UBCoS Multigen has been directed by Ilona Koupil, Professor of Health Equity Studies at the Centre of Health Equity Studies (CHESS) in Stockholm. The core team members are based at CHESS and LSHTM and the study continues to attract and stimulate substantial international collaboration and regular student exchange. Our large, multidisciplinary team combines expertise in epidemiology, biology of human growth and reproduction, cutting-edge statistical approaches to modelling of lifecourse and intergenerational data, social epidemiology, public health, several clinical disciplines and social science. This combination of skills and expertise makes us one of the leading research groups on research on intergenerational determinants of health inequalities. The UBCoS Multigen study has been funded by the Swedish Council for Working Life and Social Research (FAS) and the Swedish Research Council (VR).

### **Summary**

Our research goal, and the aim of UBCoS Multigen, is to explore how the socio-economic environment interacts with adverse early-life growth and development to predict health and social outcomes across the lifecourse and across generations. This program of work draws on our combined expertise in researching both the developmental origins of disease and the social determinants of health. It aims to elucidate the interplay of social and biological mechanisms that together can result in the reproduction of health inequalities from one generation to another. We strongly believe such understanding will clarify disease aetiologies, generate evidence for effective policy interventions, and thereby contribute to the promotion of both health and health equity.

### **Conflict of interest**

None

## **References**

De Stavola, B. L., Leon, D. A., and Koupil, I. Are intergenerational associations in size at birth mediated by socio-economic factors? Results from three generations of the Uppsala Birth Cohort Multigenerational Study, Sweden, 1915-2002. *American Journal of Epidemiology* 2011. (DOI) 10.1093/aje/kwr032 [Epub ahead of print]

Gluckman PD, Hanson MA, Bateson P, et al. Towards a new developmental synthesis: adaptive developmental plasticity and human disease. *Lancet*. 2009 May 9;373(9675):1654-7.

Goodman A, Gisselmann M, Koupil I. Birth outcomes and early-life social characteristics predict unequal educational outcomes: consistency across Swedish cohorts born 1915-1929 and 1973-1980. *Longitudinal and Life Course Studies* 2010;1(4):317-338.

Gisselmann M, Koupil I, De Stavola BL. The combined influence of parental education and preterm birth on school performance. *J Epidemiol Community Health*. 2010 May 27. [Epub ahead of print]

Koupil I. The Uppsala studies on developmental origins of health and disease. *J Intern Med* 2007;261:426-36.

Kuh D, Power C, Blane D, Bartley M. Socioeconomic pathways between childhood and adult health. In: Kuh D & Ben-Shlomo Y (eds) *A Life Course Approach to Chronic Disease Epidemiology*, pp. 371-395. Oxford University Press. Oxford, 2004.

Leon DA, Lithell HO, Vågerö D et al. Reduced fetal growth rate and increased risk of death from ischaemic heart disease: cohort study of 15 000 Swedish men and women born 1915–29. *Br Med J* 1998; 317: 241–5.