



## SCIENTIFIC FINAL REPORT

Regnr Östersjöstiftelsen: 2014-0050

Project manager: Mall Leinsalu

Project title: Adverse childhood experiences, alcohol use in adulthood and mortality:  
Examining the associations using retrospective survey data and record linkage in Estonia

### 1. Purpose of the project

Life course epidemiology has highlighted that processes occurring across the life span can impact on health and well-being in later life. In particular, adverse experiences in childhood have been associated with variety of negative health behaviours and outcomes in adulthood. Given this, the project had two main objectives. Firstly, to examine if there is an association between childhood adversity and harmful alcohol consumption in adulthood; and secondly, to examine if harmful alcohol consumption is an intervening factor between adverse childhood experiences and adult mortality.

More specifically we aimed to:

1. Examine the relationship between adverse childhood experiences and harmful alcohol consumption in Estonia;
2. Determine if there is an association between experiencing adversity in childhood and an increased risk of dying prematurely by using Estonian register data;
3. Examine pathways between adverse childhood experiences and adult mortality in this setting, with a particular focus on the mediating role of risky drinking and depression.

Estonia offers a unique environment to study the effects of childhood adversities on health behaviours and outcomes given its particular historical course in the second half of the twentieth century. The country was occupied by the Red Army in 1940 and fell under Soviet rule at the end of World War II. The period from the end of the War until Stalin's death (1945-1953) has been termed the "years of genocide" because of mass deportations, arrests and executions. The human losses of the War years and the repressive measures following it are estimated to be 17.5% of the number of Estonians. About half of Estonia's population suffered because of direct or indirect repressive measures.



## **2. The three most important results of the project and what conclusions can be drawn from them**

The project used data from Estonian Health Interview Surveys conducted in 1996/1997 and 2006/2007, including 4711 and 6434 individuals respectively. Using retrospective study design, the survey questions were broadened to cover the whole life course. The survey data were linked to registry data by using personal identification numbers. Overall attrition rate remained below 1% in both surveys. Poisson and Cox regression were used to study the associations.

Adverse childhood experiences had a strong impact on harmful alcohol consumption. In particular, we found that often going to bed hungry as a child, parental divorce and frequent alcohol use at parental home were associated with more than two times higher odds of early initiation of binge drinking. Parental alcohol use was also related to harmful alcohol consumption in adulthood even when the association was controlled by other childhood and adult socioeconomic characteristics. We found positive association between parental alcohol use and drinking at least 5 drinks at one sitting during the past 4 weeks (OR=3.79 for wine; OR=2.69 for strong alcohol). These associations were generally stronger among women. Women who had less than 50 books at parental home compared to those women who had more than 150 books had additionally higher odds of drinking strong alcohol at least 5 drinks at one sitting during the past 4 weeks (OR=2.94) Parental drinking of 3 or more times a week was also associated with frequent drinking (OR=4.47 for drinking any type of alcohol at least on half of the days during the past 4 weeks) and with alcohol abuse (measured by using CAGE questionnaire; OR=3.13) among men. At the same time, men whose parents were repressed had lower risk for alcohol abuse (OR=0.58).

We conclude that extreme poverty, stressful family relations, adverse socio-cultural environment and parental alcohol use are important determinants of harmful alcohol consumption in adulthood.

Adverse childhood experiences were strongly related with depression and thoughts of death or suicide in later life. In general population aged 25-84 years, we found that often going to bed hungry as a child was associated with an increased risk for depression



(OR=3.78). Controlling for adult socio-demographic characteristics, chronic diseases and health behaviours, the association was attenuated but remained statistically significant. In older adults (aged 60 and above), experiencing hunger in childhood more than doubled the odds for recurrent thoughts of death or suicide; the risk was somewhat attenuated in adjusted model. Frequent alcohol consumption at parental home (OR=3.32) and parental divorce (OR=1.96) were associated with adult depression among men after adjustment for other childhood and adult socioeconomic characteristics. The analysis of the effect of repressions was limited to the population aged 40 years and older. Being repressed by authorities was associated with an increased risk of depression only among men (OR=2.78) after adjustment for other adverse childhood conditions (experiencing hunger, alcohol use at parental home, parental death and parental divorce) and adult socioeconomic characteristics.

We conclude that Soviet repressions and experiencing hunger, stressful family relations and parental alcohol use in childhood may have had a long lasting effect on mental health through the life course with stronger effect seen among men.

Adverse childhood experiences (excepting parental death) were not related to overall mortality. Although we found that going to bed hungry sometimes or often as a child (HR=1.25; HR=1.33), being raised up in a single parent family (HR=1.41), experiencing death of both parents before age 14 (HR=1.88), having no books at parental home (HR=1.69) were associated with an increased risk of death in age-adjusted models among men. However, after the adjustment for all other childhood and adult socioeconomic characteristics, depression and alcohol abuse, only the association with parental death remained statistically significant (HR=1.84 among men; also HR=2.34 among women). At the same time, low household income (HR=2.03), being non-Estonian (HR=1.39), being divorced, separated or widowed (HR=1.26), having depression (HR=1.53), being alcohol abuser (HR=1.53) were independently associated with all-cause mortality among men, whereas for women the association was significant for having low education (HR=1.33), being non-Estonian (HR=1.30), having depression (HR=1.29) and for being alcohol abuser (HR=3.14). Being exposed to repressions was not associated with all-cause mortality. We conclude that although childhood adversities had strong effect on harmful alcohol consumption and adult mental health, they had no independent effect on all-cause mortality (excepting parental death).



### **3. The project's contribution to the international research frontline**

1. This is one of the few studies of general population in Eastern Europe exploring simultaneously the effect of both childhood and adult social characteristics on adult health behaviours and health outcomes using longitudinal data and record linkage.
2. The project showed that Soviet repressions had a long lasting effect on population mental health.
3. The project also showed that the impact of adverse childhood experiences on mental health was more important among men, whereas adult socioeconomic characteristics were equally important among men and women.
4. The project substantially enhanced our knowledge base about the determinants of harmful alcohol consumption in Eastern Europe.

### **4. New research questions that the project has led to**

What is the relationship between adverse childhood experiences and cause-specific mortality? We were not able to analyse these associations within the framework of current project because of the short follow-up time, relatively small number of deaths and insufficient statistical power. We intend to extend the research on life-course determinants also on other health outcomes, using record linkage with population censuses, Health Insurance Database and other medical registries in Estonia.

### **5. The contribution of the research to the knowledge of the Baltic Sea and East European region**

The research contributed to the knowledge of the Baltic Sea and East European region in two ways. First, we showed that the causes of extremely high levels of alcohol consumption and alcohol related harm in Central and Eastern European countries may partly be rooted in adverse childhood experiences. Second, we showed that adverse childhood experiences may have a long lasting effect on population mental health, which may explain generally higher levels of depression in Eastern Europe.

### **6. The contribution of research to multidisciplinary knowledge formation**

This study is placed within the wider interdisciplinary field of the sociology of health. The sociology of health resides both in the science of health and medicine and in the humanities and social sciences in its focus on the links and relations between societal factors and



health. Researchers involved into this project have background in both sociology and public health sciences. The research was conducted at SCOHOST (Stockholm Centre for Health and Social Change), a multidisciplinary research network at School of Social Sciences at Södertörn University aiming to examine the issues of social change and health with particular focus on Central and Eastren Europé.

### **7. Dissemination of the results of the project within and outside the research community**

The project results were (and will be) mostly disseminated through research articles in international peer-reviewed journals.

#### Published:

Reile R, Stickley A, Leinsalu M. Large variation in predictors of mortality by levels of self-rated health: results from an 18-year follow-up study. *Public Health* 2017; 145: 59-66.

Reile R, Stickley A, Leinsalu M. Re: Letter to the Editor of Public Health in response to 'Large variation in predictors of mortality by levels of self-rated health: results from an 18-year follow-up study'. *Public Health* 2017; 147: 158-159.

Reile R, Leinsalu M. Ethnic variation in self-rated health-mortality association: results from a 17 year follow-up study in Estonia. *Medicina* 2017; 53: 114-121. Open Access, <https://doi.org/10.1016/j.medici.2017.04.003>

Stickley A, Leinsalu M. Childhood hunger and depressive symptoms in adulthood: findings from a population-based study. *J Affect Disord* 2018; 226: 332-338.

Stickley A, Koyanagi A, Inoue Y, Leinsalu M. Childhood hunger and thoughts of death or suicide in older adults. *American J Geriatric Psychiatry* 2018; 26: 1070-1078.

#### Papers in progress

Leinsalu M, Reile R, Stickley A. Life course determinants of harmful alcohol consumption in Estonia.

Leinsalu M, Reile R, Laidra K, Stickley A. Long term effects of Soviet repressions on mental health outcomes in adulthood: findings from a population based study in Estonia.



Reile R, Stickle A, Leinsalu M. Life course determinants of all-cause mortality: a register based study.

PhD supervision

Rainer Reile from Tartu University, Estonia (supervised by Mall Leinsalu) analysed the association between self-rated health, adult sociodemographic characteristics and mortality using the project data. With financial support from Svenska Institutet, Reile spent nine months at SCOHOST, thus contributing to the international research collaboration between Tartu University and Södertörn University.