

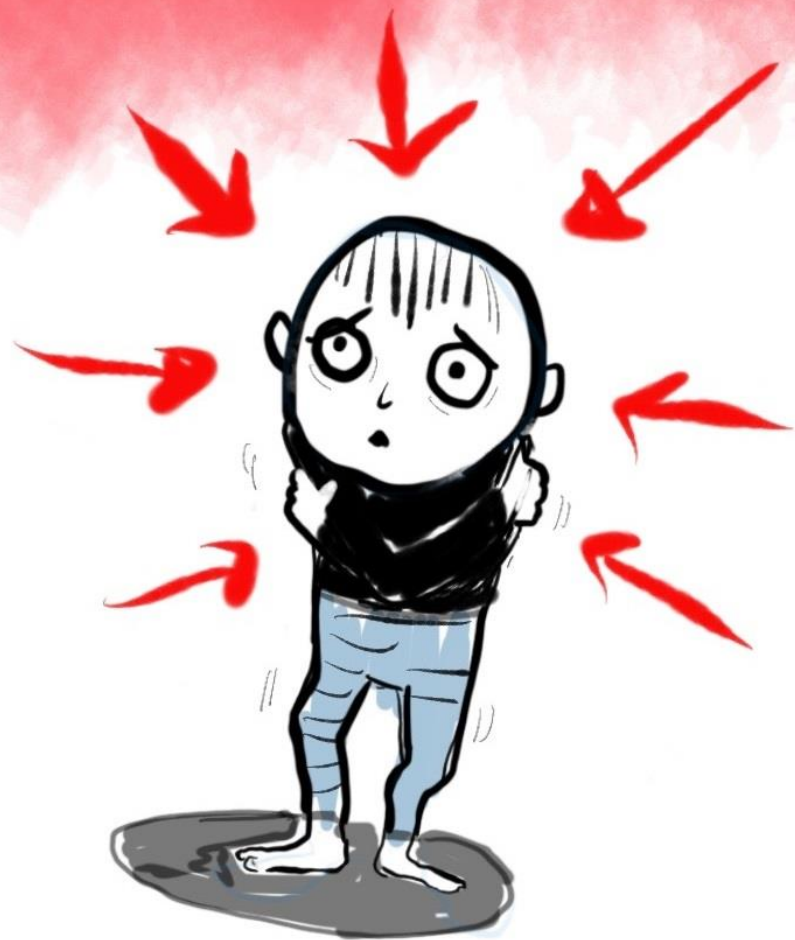


# Childhood adversity and health: The register-based DANLIFE study

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## BMJ Open Cohort profile: the DANish LIFE course (DANLIFE) cohort, a prospective register-based cohort of all children born in Denmark since 1980

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**To cite:** Bengtsson J, Dich N, Rieckmann A, *et al.* Cohort profile: the DANish LIFE course (DANLIFE) cohort, a prospective register-based cohort of all children born in Denmark since 1980. *BMJ Open* 2019;**9**:e027217. doi:10.1136/bmjopen-2018-027217

► Prepublication history for this paper is available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2018-027217>).

### ABSTRACT

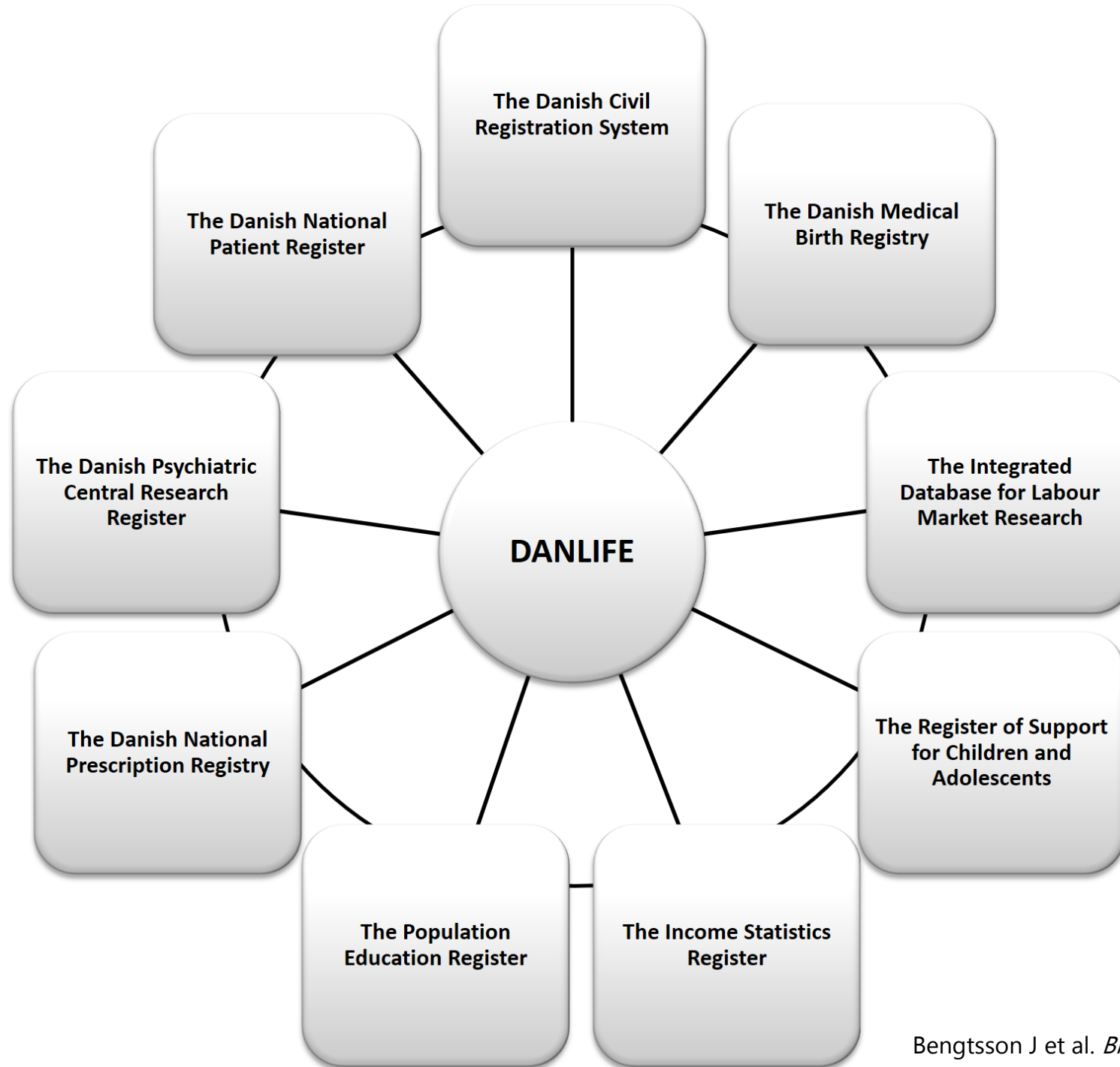
**Purpose** The DANish LIFE course (DANLIFE) cohort is a prospective register-based study set up to investigate the complex life course mechanisms linking childhood adversities to health and well-being in childhood, adolescence and young adulthood including cumulative and synergistic actions and potentially sensitive periods in relation to health outcomes.

**Participants** All children born in Denmark in 1980 or thereafter have successively been included in the cohort totalling more than 2.2 million children. To date, the study population has been followed annually in the nationwide Danish registers for an average of 16.8 years with full data coverage in the entire follow-up period. The information is currently updated until 2015.

### Strengths and limitations of this study

- The DANish LIFE course (DANLIFE) cohort provides an unselected data source for investigation of the effects of a wide range of objectively measured childhood adversities on health outcomes in childhood, adolescence and young adulthood.
- DANLIFE includes all children born in Denmark in 1980 or thereafter totalling more than 2.2 million children in the latest update in 2015. Such population size allows for the assessment of new research ideas addressing rare outcomes and complex mechanisms such as cumulative and synergistic actions and potentially sensitive periods.
- The unique identification number given to all Danish

# DANLIFE



# Childhood adversities

## Family dynamics



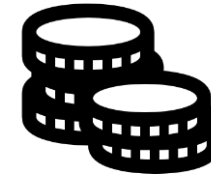
- Foster care
- Parental and sibling psychiatric illness
- Parental alcohol or drug abuse
- Parental separation

## Loss or threat of loss in the family



- Death of a parent or a sibling
- Parental or sibling somatic illness

## Material deprivation



- Family poverty
- Parental long-term unemployment

# Trajectories of childhood adversity and mortality in early adulthood: a population-based cohort study



Naja H Rod, Jessica Bengtsson, Esben Budtz-Jørgensen, Clara Clipet-Jensen, David Taylor-Robinson, Anne-Marie Nybo Andersen, Nadya Dich, Andreas Rieckmann

## Summary

**Background** Childhood is a sensitive period with rapid brain development and physiological growth, and adverse events in childhood might interfere with these processes and have long-lasting effects on health. In this study, we aimed to describe trajectories of adverse childhood experiences and relate these to overall and cause-specific mortality in early adult life.

**Methods** For this population-based cohort study, we used unselected annually updated data from Danish nationwide registers covering more than 1 million children born between 1980 and 1998. We distinguished between three different dimensions of childhood adversities: poverty and material deprivation, loss or threat of loss within the family, and aspects of family dynamics such as maternal separation. We used a group-based multi-trajectory clustering model to define the different trajectories of children aged between 0 and 16 years. We assessed the associations between these trajectories and mortality rates between 16 and 34 years of age using a Cox proportional hazards model and an Aalen hazards difference model.

**Findings** Between Jan 1, 1980 and Dec 31, 2015, 2 223 927 children were included in the Danish Life Course cohort. We excluded 1 064 864 children born after 1998, 50 274 children who emigrated before their 16th birthday, and 11 161 children who died before their 16th birthday, resulting in a final sample of 1 097 628 children. We identified five distinct trajectories of childhood adversities. Compared with children with a low adversity trajectory, those who had early-life material deprivation (hazard ratio 1·38, 95% CI 1·27–1·51), persistent deprivation (1·77, 1·62–1·93), or loss or threat of loss (1·80, 1·61–2·00) had a moderately higher risk of premature mortality. A small proportion of children (36 081 [3%]) had multiple adversities within all dimensions and throughout the entire childhood. This group had a 4·54 times higher all-cause mortality risk (95% CI 4·07–5·06) than that of children with a low adversity trajectory, corresponding to 10·30 (95% CI 9·03–11·60) additional deaths per 10 000 person-years. Accidents, suicides, and cancer were the most common causes of death in this high adversity population.

**Interpretation** Almost half of Danish children in our study experienced some degree of adversity, and this was associated with a moderately higher risk of mortality in adulthood. Among these, a small group of children had multiple adversities across social, health, and family-related dimensions. This group had a markedly higher mortality risk in early adulthood than that of other children, which requires public health attention.

*Lancet* 2020; 396: 489–97

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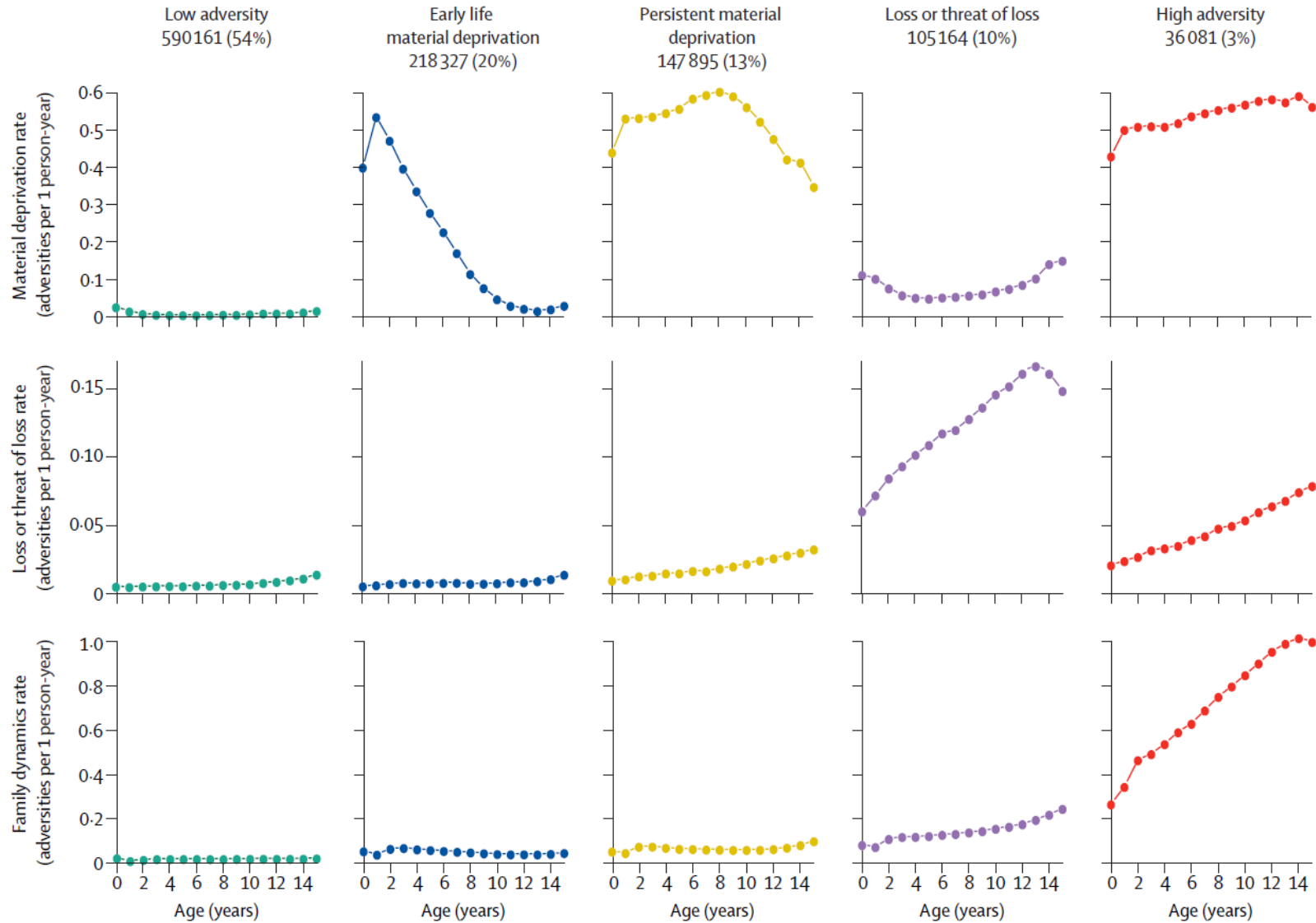
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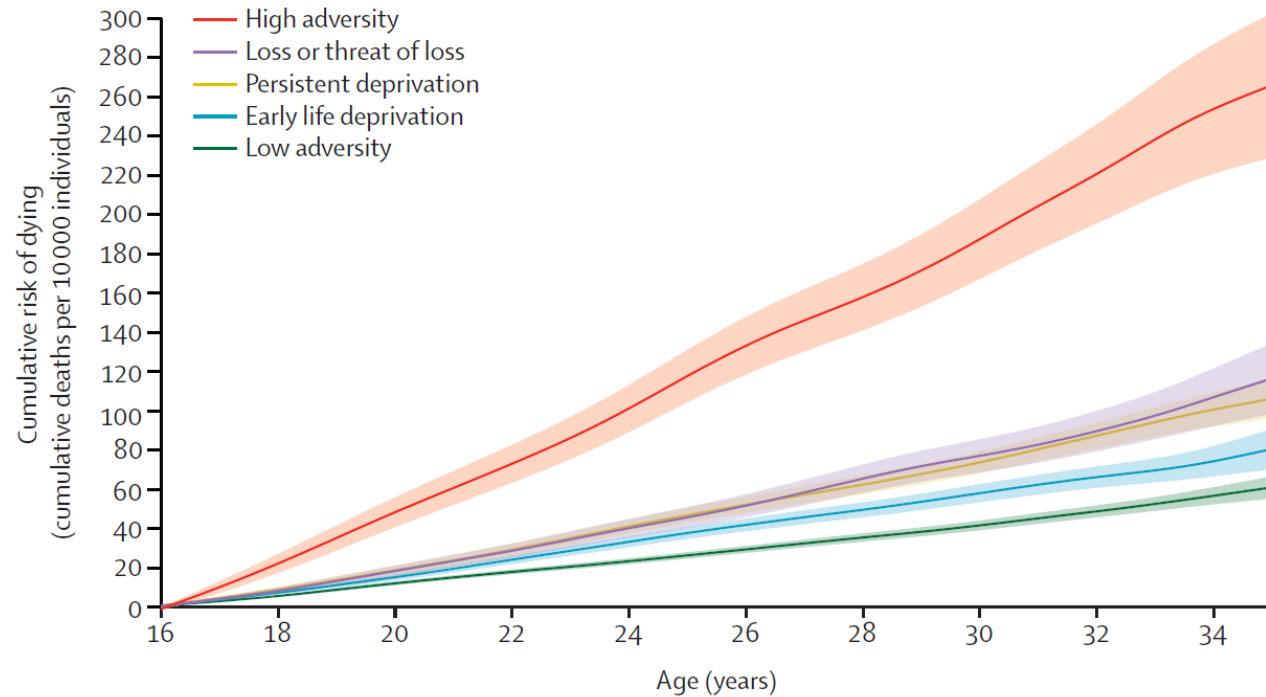
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# Five trajectory groups of childhood adversity



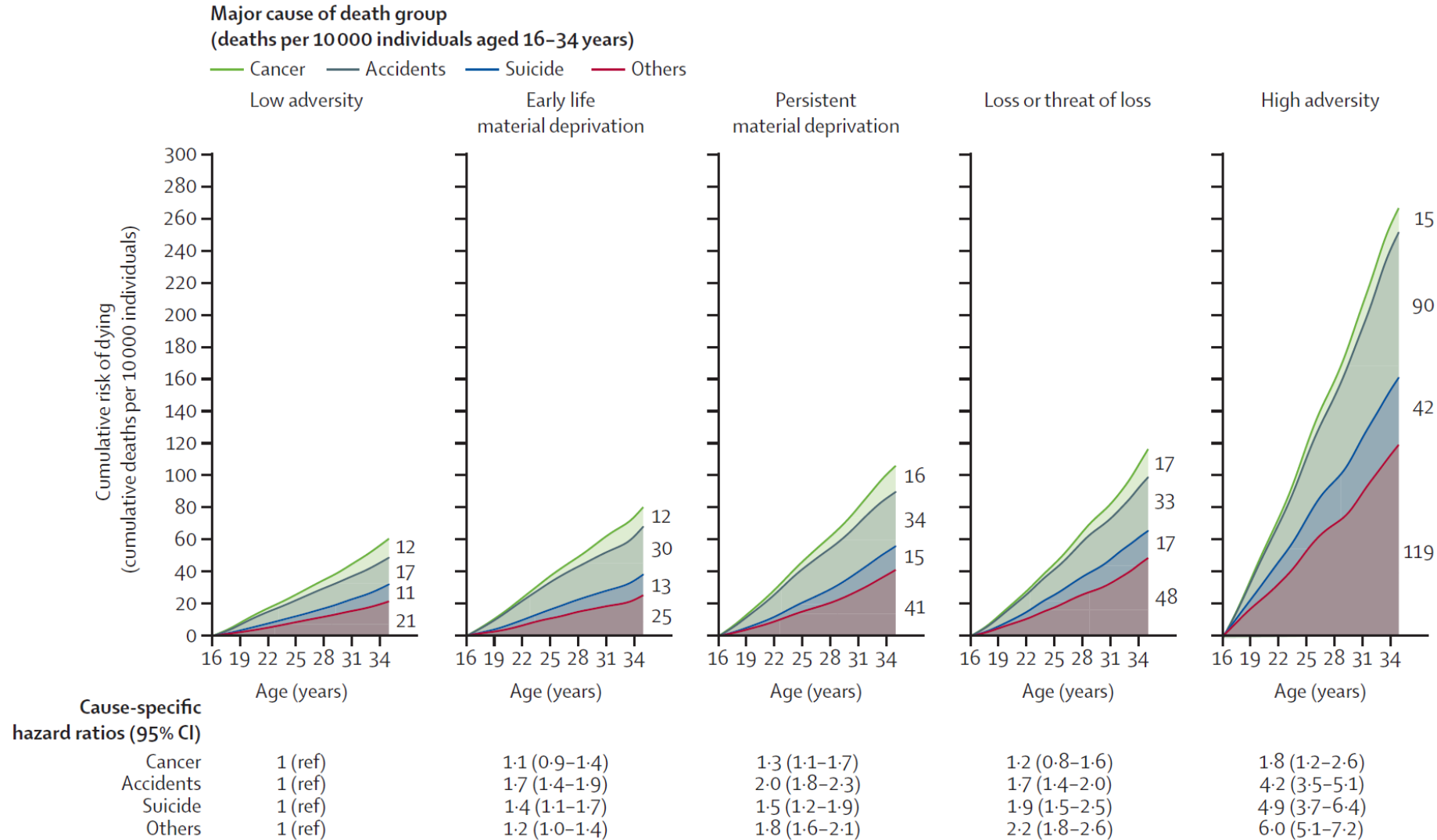
# All-cause mortality



	Deaths	Person years	Deaths per 10 000 individuals per year	Hazard ratio (95% CI)	Hazard difference (per 10 000 individuals per year)
High adversity	421	318 000	13.2	4.54 (4.07–5.06)	10.30 (9.03–11.60)
Loss or threat of loss	425	816 359	5.2	1.80 (1.61–2.00)	2.31 (1.79–2.83)
Persistent deprivation	804	1 532 324	5.2	1.77 (1.62–1.93)	2.27 (1.88–2.66)
Early life deprivation	787	1 951 522	4.0	1.38 (1.27–1.51)	1.11 (0.79–1.43)
Low adversity	1390	4 781 508	2.9	1.00 (ref)	0 (ref)



# Cause-specific mortality



# Hospitalisation patterns among children exposed to childhood adversity: a population-based cohort study of half a million children



Naja Hulvej Rod, Jessica Bengtsson, Leonie K Elsenburg, David Taylor-Robinson, Andreas Rieckmann



## Summary

**Background** Children who are exposed to adversities might be more susceptible to disease development during childhood and in later life due to impaired physiological and mental development. To explore this hypothesis, we assessed hospitalisation patterns through childhood and into adult life among those exposed to different trajectories of adversities during childhood.

**Methods** For this population-based cohort study, we used annually updated data from Danish nationwide registers covering more than half a million children (aged 0–15 years) born between 1994 and 2001. Children who were alive and resident in Denmark on their 16th birthday were included in the analysis. Cluster analysis was used to divide children into five distinct trajectories according to their experience of childhood adversities, including poverty and material deprivation, loss or threat of loss within the family, and aspects of family dynamics. To describe comprehensively the disease patterns experienced by these groups of children, we assessed the associations of each adversity trajectory with hospital admission patterns according to the entire spectrum of disease diagnoses in the International Classification of Diseases 10th edition, from birth to 24 years of age, using survival models.

**Findings** 508 168 children born between Jan 1, 1994, and Dec 31, 2001, were followed up until Dec 31, 2018, capturing more than 3·8 million hospital admissions from birth to early adulthood. Hospitalisation rates were consistently higher in all four adversity groups compared with the low adversity group. The high adversity group (14 577 children, 3%), who were exposed to adversities of deprivation, family loss, and negative family dynamics, had a markedly higher rate of hospitalisations across all ages. For example, we observed 243 additional hospital admissions per 1000 person-years (95% CI 238–248) in the high versus low adversity group for those aged 16–24 years. These associations were particularly strong for diagnoses related to injuries, unspecified symptoms, and factors influencing health service contacts (eg, health screening and observation). They also covered a considerable burden of respiratory and infectious diseases, congenital malformations, diseases of the nervous system (especially in early life), mental and behavioural diagnoses, and diagnoses related to pregnancy and childbirth in early adult life.

**Interpretation** The close linkage between childhood adversities and poor lifelong health outcomes highlights a need for public health and policy attention on improving the socioeconomic circumstances children are born into to prevent the early emergence of health inequalities.

*Lancet Public Health* 2021

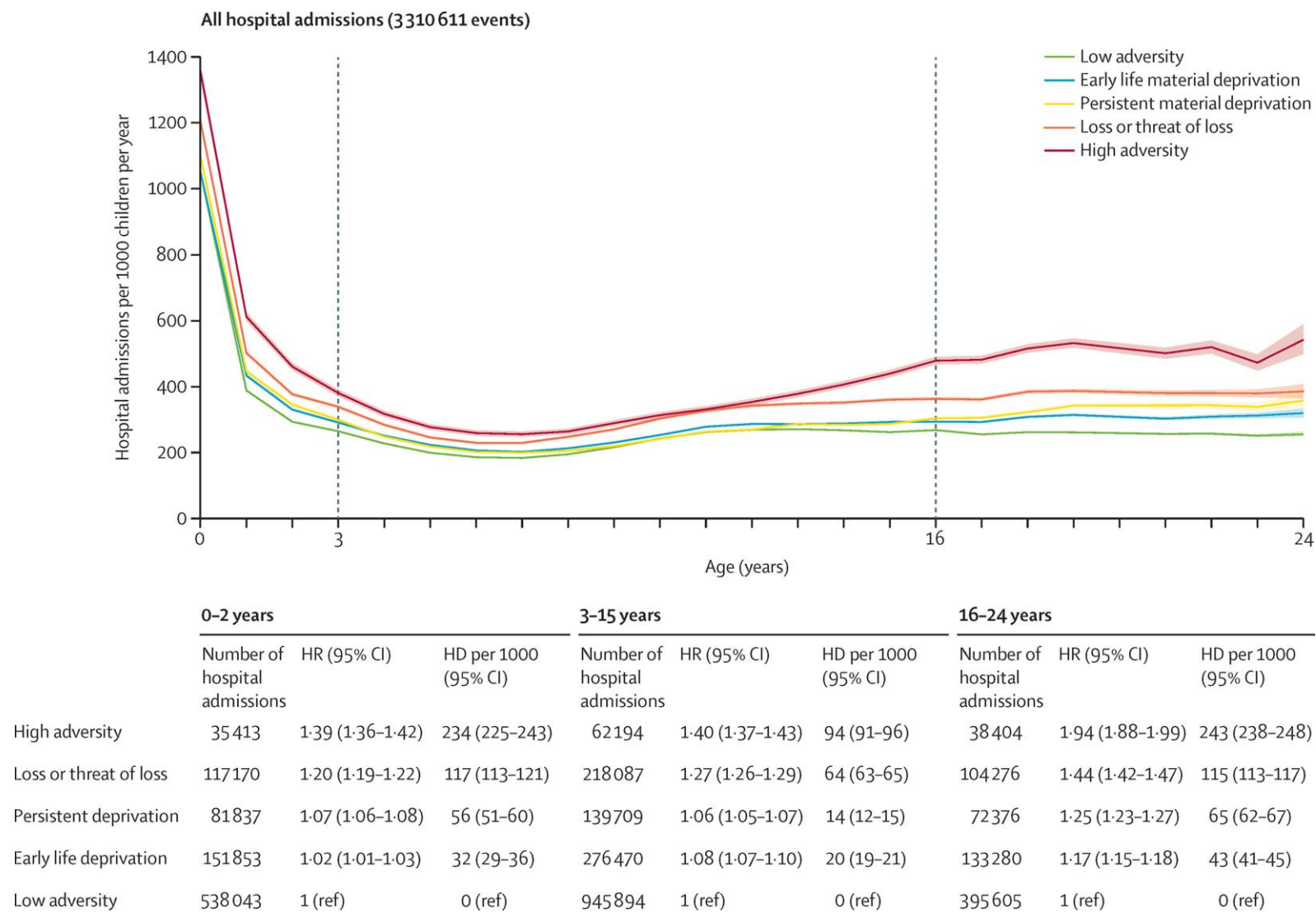
Published Online  
September 29, 2021  
[https://doi.org/10.1016/S2468-2667\(21\)00158-4](https://doi.org/10.1016/S2468-2667(21)00158-4)

See Online/Comment  
[https://doi.org/10.1016/S2468-2667\(21\)00187-0](https://doi.org/10.1016/S2468-2667(21)00187-0)

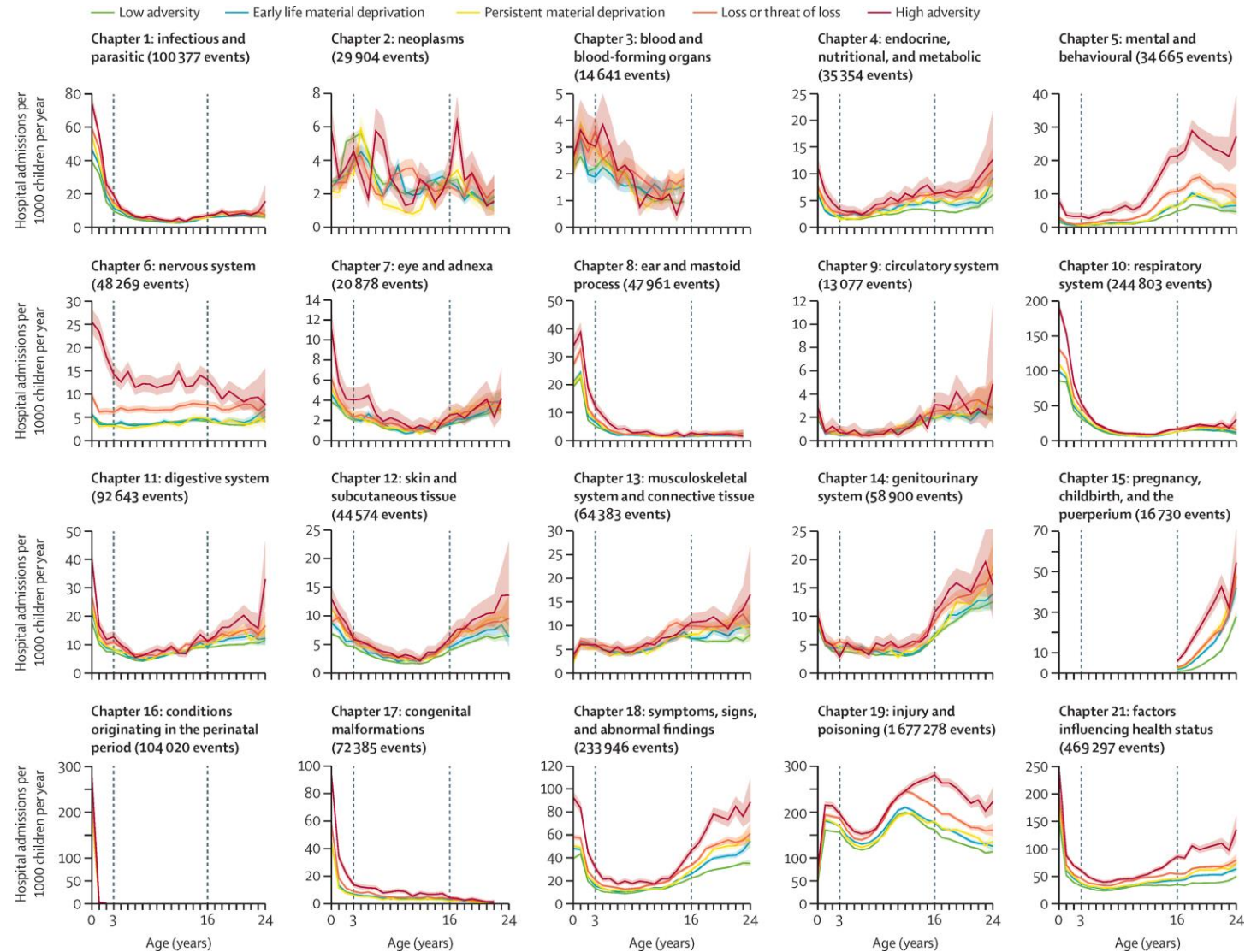
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# All hospital admissions



# Hospitalisation pattern across ICD10 chapters



# Acknowledgements

The DANLIFE team

In particular:



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Andreas Rieckmann




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DANLIFE: the DANish LIFE course cohort

The cohort follows all children born in Denmark since 1980 until adulthood to determine the implications of childhood adversity on health and well-being

Read more



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# Thank you!

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# Childhood adversities

