

APPENDIX S1.

Additional descriptions of the methodology.

Highest educational status

In a sensitivity analysis, we adjusted for the educational status of patients (when ≥ 22 y at the index date) or parents (for patients < 22 y at the index date) as a measure of socioeconomic position. Data on educational status were obtained from the Population Education Registry at Statistics Denmark. The variables and definitions of educational status used in this study have previously been described in detail by Schmidt *et al.* (2) In brief, we defined three levels of education: lower secondary education (9-10 years of school, compulsory in Denmark), upper secondary education (additional 2-4 years), and higher (tertiary) education (additional 2-9 years). For parents, we included the educational status of the parent with the highest educational level at the index date. Missing data was considered to mean that no education was attained.

We coded education level using the variables 'AFSP1H' until February 28, 2015, and 'HOVEDOMRAADE_OVER' thereafter, with the following categorisation:

- Lower secondary education: 'AFSP1H' or 'HOVEDOMRAADE_OVER' = 10 AND 'HFAUDD' 210, 1009, 1010, 1011, 1109, 1110, 1111 or 1209 (to include only lower secondary educations resulting in a qualification)
- Upper secondary education: AFSP1H or HOVEDOMRAADE_OVER = 20, 25, 30, 35, or 39
- Higher education: AFSP1H = 40, 50, 60, 65, or 70 or HOVEDOMRAADE_OVER = 40, 50, 60, 70, or 80

Causes of death

To analyse cause-specific mortality, we used data from the Danish Register of Causes of Death (3) (data tables DODSAARS and DODSAASG at Statistics Denmark) to define deaths related to infectious diseases. Our definition included at least one of the following variables and codes:

- Variable 'C_LISTE14' > group 2 ('infectious diseases excl. tuberculosis')
- Variable 'C_LISTE49' > group 1 ('infectious diseases excl. tuberculosis')
- Variable 'C_DOD1-4' or 'C_DOD_1A-D' with ICD-10 category A**, B**, or R572.

Due to a small number of deaths, we performed a *post hoc* analysis also including respiratory tract diseases, which were defined with at least one of the following variables and codes:

- Variable 'C_LISTE14' > group 6 ('diseases of the respiratory tract')

- Variable 'C_LISTE49' > groups 29 (acute respiratory tract infections incl. influenza), 30 (pneumonia), 31 (bronchitis, bronchiectasis, and asthma), and 32 (other diseases in the respiratory system)
- Variable 'C_DOD1-4' or 'C_DOD_1A-D' with ICD-10 category J**.

Hospital contacts in the Danish National Patient Registry (DNPR)

The DNPR (4) includes inpatient contacts since 1977 and outpatient contacts since 1995. Since 2019, an updated version of DNPR ("LPR3") has been used, which does not define the type of contact registered. For this period, contacts lasting ≥ 6 hours were defined as inpatients.

Recurrent events of hospital contacts and prescriptions

We conducted a recurrent event analysis of hospital-treated infections and antimicrobial prescriptions to consider the possibility of multiple infections during follow-up. When defining recurrent events, we had to consider that consecutive registrations of hospital contacts or prescriptions could represent the same infection. We therefore discarded registrations of the same ICD-10 diagnosis category (letter) or ATC category (level 1) within 30 days of the first registration.

For regression analyses of recurrent events, we applied the Andersen-Gill extension of the Cox model(4).

SUPPLEMENTAL REFERENCES

1. Mor A, Berencsi K, Nielsen JS, Rungby J, Friberg S, Brandslund I, et al. Rates of Community-based Antibiotic Prescriptions and Hospital-treated Infections in Individuals With and Without Type 2 Diabetes: A Danish Nationwide Cohort Study, 2004-2012. *Clin Infect Dis* 2016; 63: 501-511.
2. Schmidt SAJ, Mailhac A, Darvalics B, Mulick A, Deleuran MS, Sørensen HT, et al. Association Between Atopic Dermatitis and Educational Attainment in Denmark. *JAMA Dermatol* 2021; 157: 1-9.
3. Helweg-Larsen K. The Danish Register of Causes of Death. *Scand J Public Health* 2011; 39: 26-29.
4. Schmidt M, Schmidt SA, Sandegaard JL, Ehrenstein V, Pedersen L, Sørensen HT. The Danish National Patient Registry: a review of content, data quality, and research potential. *Clin Epidemiol* 2015; 7: 449-490.
5. Andersen PK, Gill RD. Cox's Regression Model for Counting Processes: A Large Sample Study. *The Annals of Statistics* 1982; 10: 1100-1120, 1121.