

R code for
this analysis
is available
here:



Poverty prevention throughout childhood may be more effective at reducing adolescent smoking than intervention at particular life-stages

Childhood poverty and adolescent smoking: dependency of effects on timing and background

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Background

Socioeconomic circumstances in childhood are likely to be important determinants of adolescent behaviours like smoking, but we need to better understand **when** to intervene and **how long** for, acknowledging that effects of poverty may:

1. Vary over time;
2. Vary depending on background history;
3. Be subject to time-varying confounding, where some factors may serve as both confounders and mediators of poverty effects depending on their temporal ordering.

Methods

Data were from 7,177 respondents to the UK Millennium Cohort Study with complete data on all analysis variables and were weighted for attrition.

Exposure of interest: Poverty measured at 9 months and at 3, 5, 7 and 11 years (<60% median household income).

Outcome of interest: Ever smoked a cigarette by age 14.

Baseline Confounders: Maternal age, education, ethnicity, UK country & smoking during pregnancy.

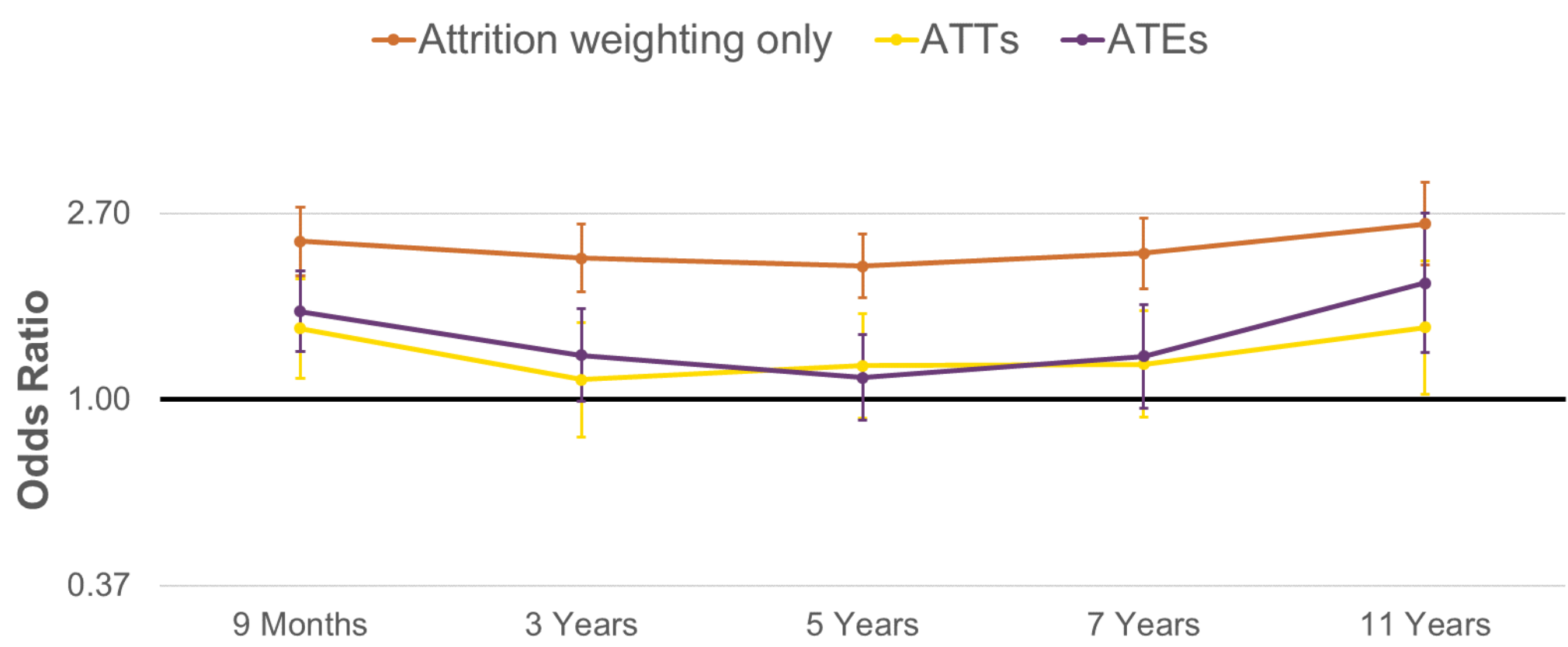
Time-Varying Confounders: Maternal smoking, and Maternal mental health.

Analysis: Effects were estimated using either propensity weighting or marginal structural models to allow for time-varying confounding. The TWANG package in R was used to optimise the extent to which propensity scores balanced confounders across levels of exposure.

Results

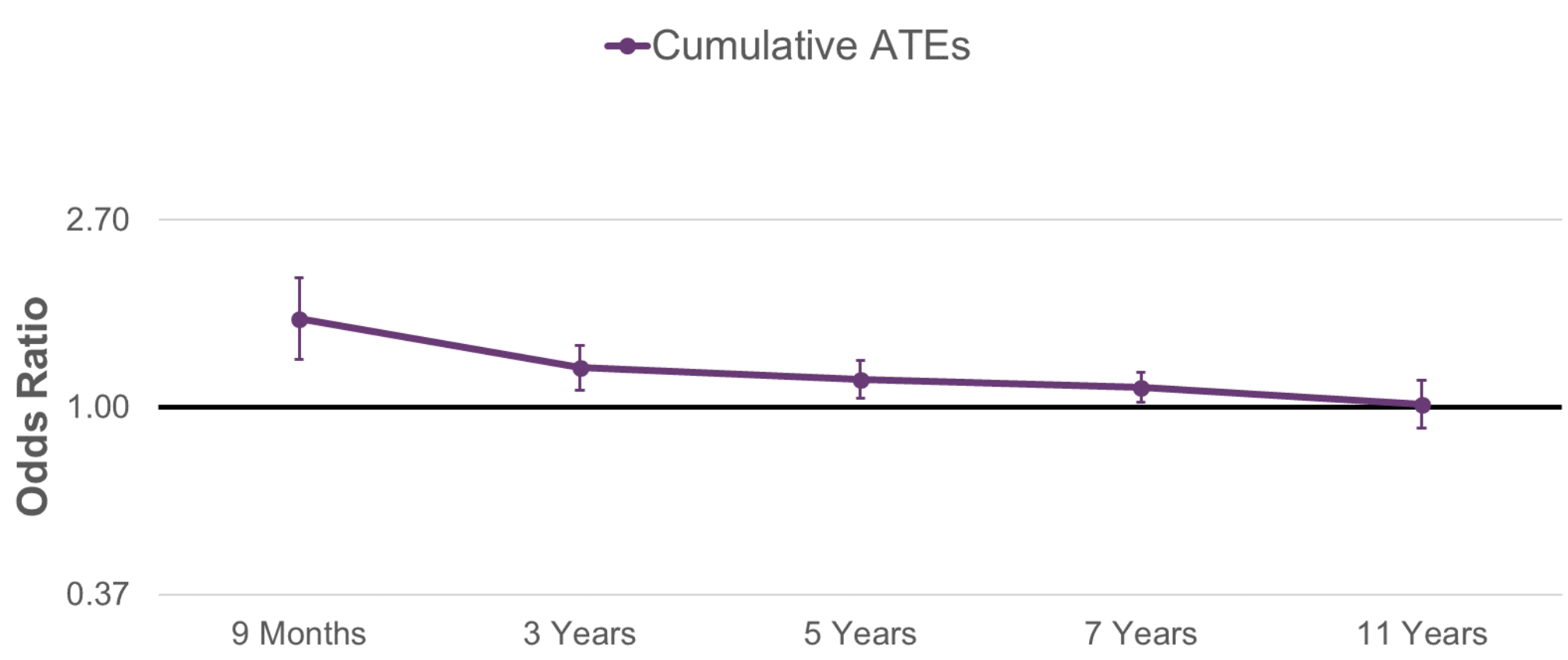
ATE (Average Treatment Effect): The effect poverty exposure has on an average person at this time.

ATT (Average Treatment Effect Among the Treated): The effect poverty exposure has on those who actually experienced it at this time



Both ATE & ATT estimates show clear effects in early life and at 11 years, though there was little variation in either effect size over time. The ATE/ATT estimates also had over-lapping confidence intervals, suggesting effects were not dependent on background factors predicting poverty (i.e. baseline confounders & earlier measures of poverty and time-varying confounders).

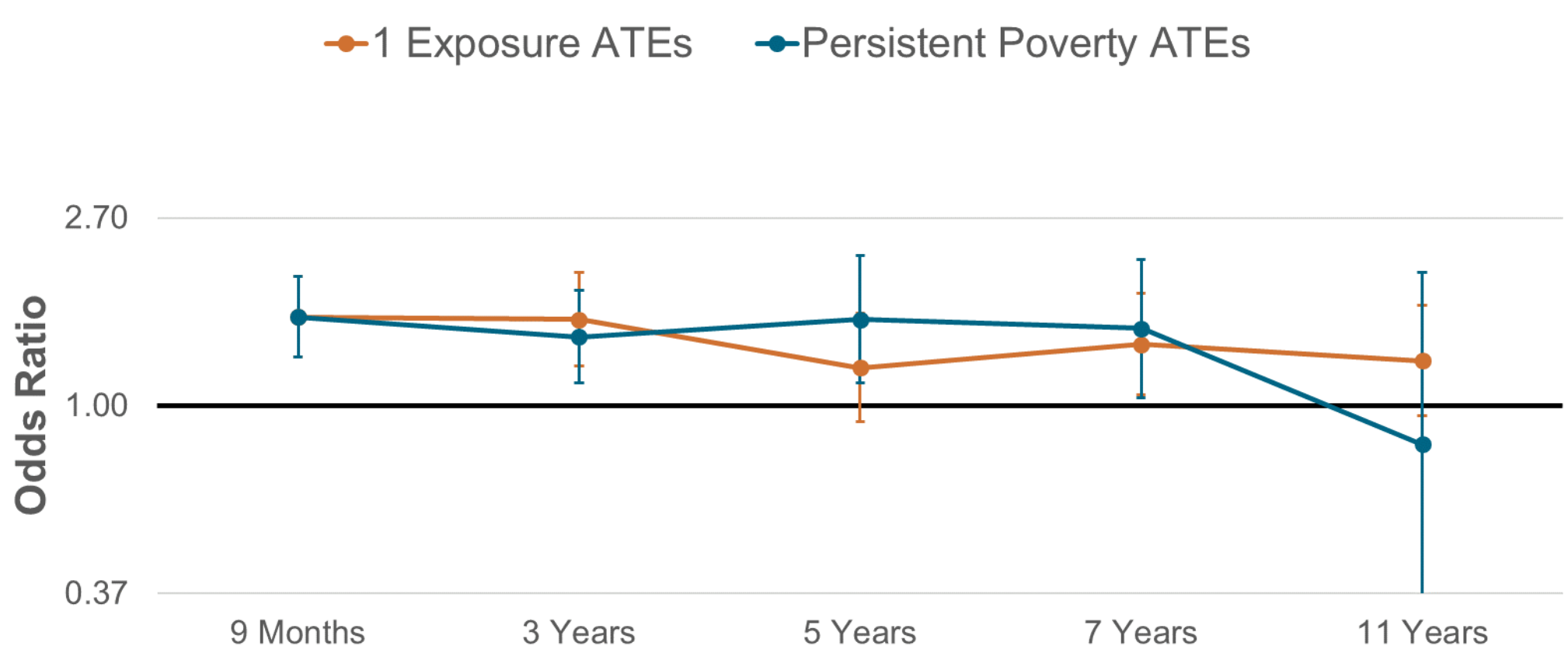
Cumulative ATE: The cumulative ‘dose-response’ effect of each instance of poverty up to the time-point on the x-axis (allowing for time-varying confounding).



A cumulative effect of additional instances of poverty is evident up to age 7, but the decrease in estimates over time indicates either stronger effects for earlier poverty, a non-linear effect (where additional exposure matters less), or perhaps both.

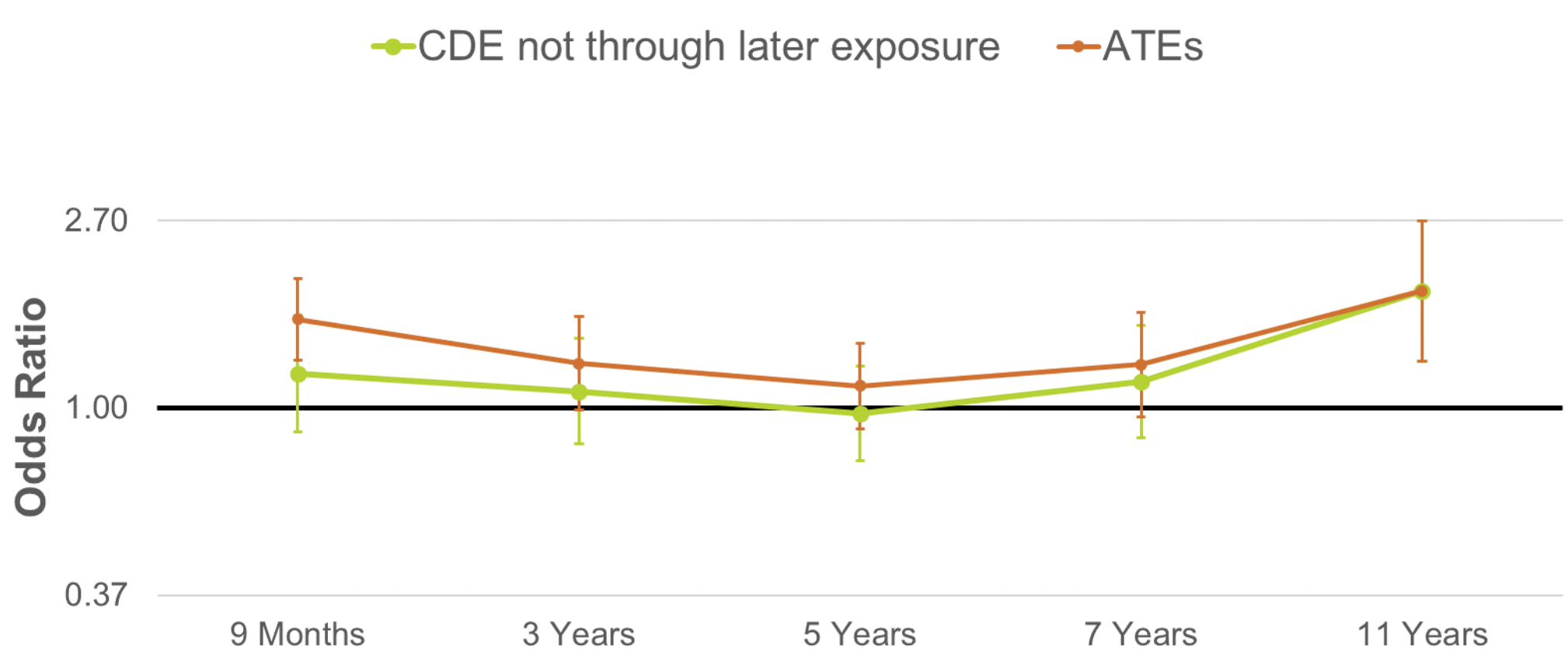
1 Exposure ATE: The effect of experiencing exactly 1 instance of poverty up to the time-point on the x-axis (irrespective of timing), relative to no poverty.

Persistent Poverty ATE: The effect of experiencing persistent poverty up to the time-point on the x-axis, relative to no poverty.



Effects of persistent poverty were not clearly higher than for a single instance of poverty. This supports a non-linear effect of poverty exposure. Effect sizes for a single poverty exposure only marginally decreased over time indicating that preventing poverty remains important throughout childhood.

CDE: The controlled direct effect of exposure at this time, not mediated via later exposure.



There was little evidence for clear direct effects of early life poverty. Effects may therefore be via later exposure, again indicating benefits for prevention throughout childhood.

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