Background
Childhood poverty is associated with later elevated risks for self-directed and interpersonal violence. However, changes in parental income during upbringing on the risk of these outcomes remain unclear. We aimed to investigate fluctuations in parental income levels during childhood and subsequent risk of self-harm and violent criminality; in particular, to examine the associations by: 1) parental income in the year of birth, in early and middle childhood, and adolescence; 2) time spent in financially disadvantaged versus affluent conditions; 3) changes in parental income between the year of birth and age 15 years.

Methods
Using interlinked Danish national registers, we constructed a nested case-control study of all first registered episodes of self-harm (n=16,915) and all first violent crime convictions (n=19,579) during 1997–2012 at ages 15–30 years. Twenty five unaffected controls were matched to each case on sex and age using incidence density sampling. Parental income was assessed in the year of birth, and at ages 5, 10 and 15 years. Incidence rate ratios (IRRs) were estimated using conditional logistic regression in Stata 13.1.

Results
For both outcomes, the lower the income the higher the risk. The associations were stronger for violent offending than for self-harm, with those from the lowest income quintile showing disproportionately higher risks. The longer a child lived in poorer circumstances the higher the risk, and vice versa for time spent in more affluent conditions. For example, compared with those whose parental income was consistently at the highest quintile at all 4 age points, those whose parental income remained in the lowest quintile were at 7 and 10 times elevated risk for self-harm (IRR=6.9, 95% CI 6.4–7.4) and violent offending (IRR=10.3, 9.6–11.0), respectively. Compared with parental income being in the highest quintile at birth and also at age 15 years, all other income trajectories between these two ages were associated with elevated risks for both outcomes. In general, however, regardless of the parental income at birth, being upwardly mobile was associated with smaller elevations in risk compared with being downwardly mobile.

Conclusion
Family income dynamics are strongly linked with later risks of self-harm and violent criminality. Although income is a marker for an array of familial circumstances and causal inferences could not be drawn, our findings suggest that reducing poverty at any stage during children’s development and promoting upward socio-economic mobility could ameliorate such risks, and have a marked cumulative societal benefit.