

## Three Essays on Parental Health Adversities and Children's Educational Outcomes

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Parental illness can lead to psychological distress for children at any age, resulting in significant negative consequences. When experienced during children's high school years, parental illness can have long-lasting effects on their academic performance and achievements. This period is critical in children's lives due to the unique physical, cognitive, and social changes they undergo (Garipey et al., 2017). Parental illness during this sensitive phase places substantial financial and emotional burdens on both children and their families, potentially impacting them into adulthood (De Neve & Oswald, 2012; Keyes, 2006). Centers for Disease Control and Prevention's (2023) data suggests that approximately 6 out of 10 adults in the US have a chronic disease.

The long-term well-being of children with chronically ill parents is an important research topic, as it can inform the development of interventions to address the needs of this at-risk population. While numerous studies have explored the adverse consequences of children's illness on parents and families, limited literature examines the impact of parental illness on children. Moreover, most recent studies investigating the effect of parental illness on children's educational attainment have used data from Europe (e.g., Aaskoven et al., 2022; Kristiansen, 2021). However, due to variations in healthcare systems and social safety nets, findings from these studies may not be entirely generalizable to other countries. Addressing this research gap, our study aims to examine the links between parental chronic illness and outcomes related to the children's secondary and tertiary education using U.S. data. We hypothesize that children whose parents have experienced chronic illness before or during high school will have lower GPAs, are less likely to attend college by the age of 21 years and have lower expectations to complete college education when asked at 21 years or younger compared to their peers with healthy parents.

The empirical analysis utilized data from the 1999-2019 waves of the Panel Study of Income Dynamics (PSID) and the 2005-2019 waves of the Transition to Adulthood Supplement (TAS). The analysis sample consisted of matched pairs of young adults and their parents, in which the TAS dataset provided information on the respondents' high school GPA at graduation, college enrollment status by the age of 21 years and expectation to complete four years of college education when asked at 21 years or younger. The PSID dataset included parental responses regarding various health conditions experienced, such as cancer, stroke, heart attack, heart disease, hypertension, diabetes, asthma, lung disease, arthritis, memory loss, learning disability, psychological conditions, or other conditions.

Our empirical approach involved estimating multiple regression models to examine the relationship between GPA measured on the percentage scale (dependent variable) and binary indicators representing the onset of health conditions experienced by each parent (key independent variables). For the second study we estimated multiple logistic regression models to examine the relationships of each of the outcomes, college enrollment by the age of 21 years and expectation to complete four years of college education when asked at 21 years or less with the key independent variables. We included a comprehensive set of socio-demographic and economic control variables to account for confounding factors, as well as the year fixed effects on all of the above models.

The results revealed statistically significant and quantitatively meaningful negative effects of maternal health conditions on the child's high school GPA, expectation of completing a 4-year college

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degree and actual college enrolment at the age of 21 years or younger. In contrast, the effects of paternal health conditions were inconclusive and weak.

An illness experienced by the mother before the child's high school years led to a decrease in the child's GPA by 1.26 percentage point ( $p < .1$ ). Applying variable coding that categorized health conditions by type and severity, we observed that children of mothers with severe chronic illnesses (e.g., cancer, stroke, heart attack, lung disease) and psychological illnesses (e.g., memory loss, learning disability, psychological conditions) had GPAs approximately 2.23 ( $p < .05$ ) and 2.07 ( $p < .05$ ) percentage points lower, respectively, compared to children with healthy mothers.

Mental illness experienced by the mother at any time before the child's high school graduation negatively impacted the odds of the child's college enrollment ( $\approx 0.441OR$ ,  $p < .001$ ). Compared to the effects of onset before high school, the impact of maternal health conditions with an onset during the child's high school years was stronger and negative on the child's college enrollment ( $\approx 0.279OR$ ,  $p < .05$  vs.  $\approx 0.614OR$ ,  $p < .1$ ).

Additionally, as the number of co-occurring maternal health conditions increased, the estimated magnitude of negative effects on high school GPA, college enrollment by age 21, and the expectation to complete college also increased monotonically.

In additional data analyses, we aimed to explore the underlying pathway of the estimated effects. To accomplish this, we augmented the models by introducing additional control variables, such as changes in the family's economic status (income, net worth), marital status of parents, and the student's self-reported closeness of relationship to each parent. While the inclusion of these variables slightly attenuated the aforementioned effects, all estimates remained statistically and quantitatively significant. This suggests that pathways involving increased household and caregiving responsibilities, restricted social activities and isolation, and psychological distress likely contribute to the impact of a mother's chronic illness on the child's high school performance.

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