Family formation processes have long been associated with social stratification in America (Moynihan 1965; Ellwood and Jencks 2004; Burtless 1999; Lerman 1996; Massey 2007; McLanahan and Percheski 2008; Western 2006). The diminished life chances of children growing up in single-parent families has been documented for decades, as have selection processes by which poor and disadvantaged youth become teenage parents or experience non-marital childbearing, reinforcing social stratification across generations (Garfinkel and McLanahan 1986; McLanahan and Sandefur 1994; Edin and Kefalas 2005; Hoffman, Foster, and Furstenberg, 1993). The troubling links between socioeconomic status and family formation received increasing research and public attention as the proportion of single parent families grew in the 1980s and the proportion of births to unmarried mothers climbed in the 1990s, threatening the fabric of mainstream family life in America (Murray 1984; Moffitt 1998). These trends have continued in the first decade of the 21st century as scholars and policymakers alike search for explanations for the profound changes to the U.S. family (Seltzer et al. 2005; Johnson-Hanks et al. 2011).

In 1960, only 6% of children in the U.S. lived with a single parent. Today, over half of all children are expected to spend some time in a single-parent family before turning 18 years old. Furthermore, the composition of single-parent families shifted from widowed mothers in 1960 to divorced mothers in the 1980s to never-married mothers in the 2000s. And while there remain subgroup differences in patterns of family formation, these dramatic shifts have occurred in all race, ethnic, socioeconomic, geographic and age subgroups (Murray 2012). In concert with these changes, trends in cohabitation resulted in a rising proportion of non-marital births occurring to cohabiting couples, increasing the complexity of family formation pathways in the U.S. Indeed, contemporary family life is defined by a wide diversity of family structures (Seltzer 2000), pathways of family formation (Smock and Greenland 2010), and consequences for parents and children (Amato and Kane 2011).

While substantial research has examined the socioeconomic precursors and consequences of family formation events, few studies have examined the role of health in family formation pathways, a critical factor in social stratification processes (Seeman and Wolf 2012). There is substantial literature examining health as both a determinant and a consequence of marriage, but very few articles examine the role of health in relation to childbearing. Our paper examines the health consequences of family formation pathways for a recent cohort of young women using the nationally representative study Add Health. We focus on how pre-union and pre-conception health in early adolescence sets up pathways of family formation, which in turn have consequences for later health in adulthood. We focus in particular on how the context of non-marital childbearing is related to subsequent health by tracing the diverse pathways by which women form cohabiting and marital unions and bear children within or outside these unions, while adjusting for health and socioeconomic status prior to family formation transitions. Our research contributes to understanding the consequences of family diversity in the contemporary era in which cohabitation is increasingly considered a normative step in the progression of stable, permanent relationships and more than two out of five births occur outside marriage. Our findings suggest health is an important marker of social stratification early in life such that poor health sets a life-long developmental trajectory of cumulative disadvantage that carries through social and behavioral processes across the life course.

The figure below presents our general conceptual model which guides our analysis. Family formation influences later life health, but is itself, in part, the result of earlier life health.

Early life health has both direct and indirect, mediated through family formation, effects on latter life health.
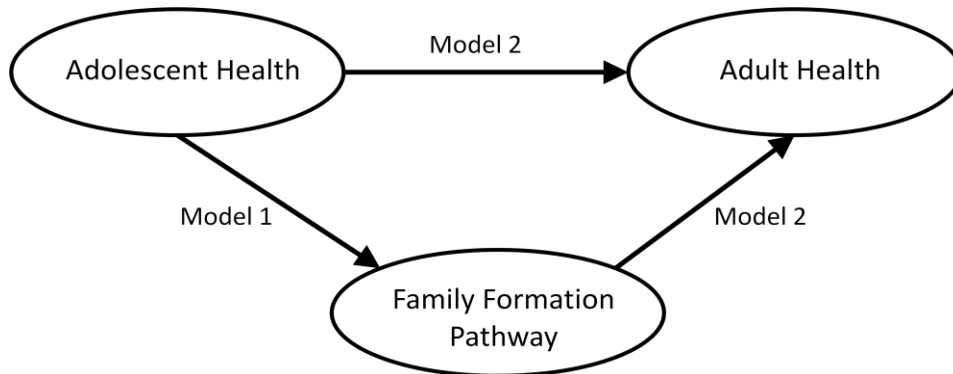
Data and Methods

For this study we use data from waves I and IV of Add Health (the National Longitudinal Study of Adolescent Health). Add Health is a nationally representative sample of more than 20,000 adolescents in grades 7–12 in 1994–1995 in the United States (Harris et al. 2009). The respondents were followed in three additional in-home interviews in 1996 (Wave II), 2001-02 (Wave III), and 2008-09 (Wave IV), when 15,701 of the original respondents were most recently interviewed. Data from the first wave are used to establish respondent's early life health histories, as well as parental socioeconomic status and baseline controls. Data from the fourth wave are used to construct family formation trajectories using retrospective listing of birth and relationship transitions, as well as providing current assessment of respondent health. To address potential concerns with fertility reporting, we limit our sample to women.

Add Health is an ideal data source for this topic. First, the longitudinal nature of data collection mitigates concerns over delayed retrospective recall and bias for measures of adolescent health and parental household status (birth histories are reported at each wave and can therefore validate the Wave IV retrospective reports). Second, this age range (from 12-34 years old) covers the most active life period with regard to relationship behaviors in the U.S.: the average age of women's first cohabitation (21.8), marriage (26.9), and childbirth (25.6). Third, with this rich dataset we can include a wide variety of important controls and potential confounders of the relationship between health and family formation

Our models include controls for respondent age, nativity, highest achieved level of education, self-reported race, cognitive ability (Peabody Vocabulary Score), family structure of the respondent's family of origin, and individual predisposition to marriage (perceived likelihood of being married by age 25). Health status was measured by respondent self-report of overall health, at both Wave I (adolescent) or Wave IV (adult). While individuals reported on a 5 point scale, ranging from "Excellent" to "Poor," very few respondents selected the worst health category so we combined the lowest two categories into a "Fair or Poor Health" category.

Finally, we constructed a categorical variable that describes a woman's family formation pathway using the relative timing of events surrounding her first live birth. Women were categorized by determining the order in which cohabitation, marriage, or birth occurred with the father of her first child. Nulliparous women were classified using their order or engagement in other relationship behaviors. We collapsed the variety of potential pathways into five meaningful categories: 1) no relationship behavior; 2) the traditionally normative marital

pathway (no cohabitation and marriage is the first relationship activity); 3) current cohabitation or premarital cohabitation (the increasingly common relationship pathway in which respondents are either currently cohabiting or cohabited prior to marriage); and two pathways that involve non-marital births (4) cohabiting births and 5) non-residential births). A novel contribution of this paper is our differentiation of non-marital birth contexts into cohabiting births and non-residential births to better understand whether previously identified health consequences of non-marital births are due to the absence of a marriage or the absence of a residential co-parent.

We use relative sequencing of events, rather than calculating timing exposure, to better match existing literature which has to date focused on the state of the relationship at the time of childbirth. Our measure of family formation is also remarkably robust to concerns about transitions out of these relationships before subsequent events, as few divorces occur or cohabitations end prior to the next family formation milestone. In sensitivity analysis, we defined these pathways according to the relationship status at the time of pregnancy, rather than the birth, to address concerns over relationship transition in response to a pregnancy. As these models found similar results to those presented here, we present the models using birth events to define family formation pathways.

Our first model, labeled model 1 in the preceding figure, explores how health influences a woman's subsequent family formation pathway. We modeled this question using a multinomial logistic regression predicting family formation behavior. Though there may be concern in modeling these different pathways as independent choices, we have grouped these behaviors in such a way as to clearly delineate separate and distinct behavioral pathways and post-estimation tests of the IIA, independence of irrelevant alternatives, assumption provide support for our use of this model form.

Our second model, model 2 in the diagram above, follows how family formation pathways influence a woman's later life health. While this outcome is ordinal, the Brant test suggests that the proportional odds assumption is invalid. Therefore, we use the Generalized Ordered Logistic Model, which allows the coefficients of the independent variables in the model to vary by the level of the dependent variable. In this model, we control for health selection by including previous health status on the right-hand-side of the equation. We control for respondent educational attainment in addition to all previous controls. Both models, mlogit and gologit2, are estimated using Stata 13. We use the svy command to account for the weighted and clustered nature of the Add Health sample.

Preliminary Results

In this sample of women, 12.4% of women reported no family formation activities, 21.4% followed the "traditional" marital pathway, 34.3% followed a cohabitation or premarital cohabitation pathway, 16.8% had a cohabiting birth, and 15.1% had a non-residential birth. Among women's first births, 42% of births occurred inside a marriage, 30.6% of births were to cohabiting partners, and 27.4% of first children were born outside of a residential relationship. This description is an important, and novel, description of fertility contexts and behaviors in a recent, nationally representative cohort of young adults that updates previous estimates of the context in which non-marital births occur. A weighted diagram of the pathways of relationship behavior of the sample is shown below. Each woman experiences events (color coded by type) from left to right, with the number of women in a given pathway represented as the height of the bar. For example, among women whose first family event was marriage (red), about half subsequently had a child (yellow) and half reported no further relationship activity (blue).

Relative Sequencing of Family Formation Behavior in Add Health Women, Wave IV (N=7,749)
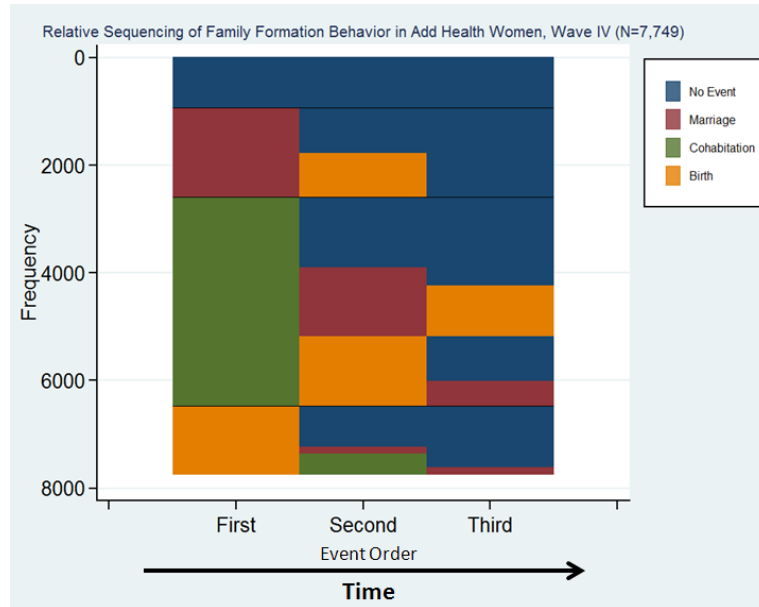
In the multinomial logistic model predicting family formation behavior, we use the most common category (cohabitation or premarital cohabitation) as the reference category. Individuals in only good, rather than excellent, health are significantly less likely to be in the traditional marital pathway than the reference pathway. Poorer health is associated with an increased likelihood of having a non-marital birth. Women who reported being in only good or fair/poor health during adolescence are, relative to their counterparts who reported being in excellent health, more likely to have had a cohabiting or a non-residential birth than to be in the reference category. A visualization of these findings, depicting average marginal effects of early life health status on family formation pathway, is shown in Figure 3.


Figure 3: Average Marginal Effects of Health Status on Likelihood of Family Formation Pathway, (ref=Excellent Health)
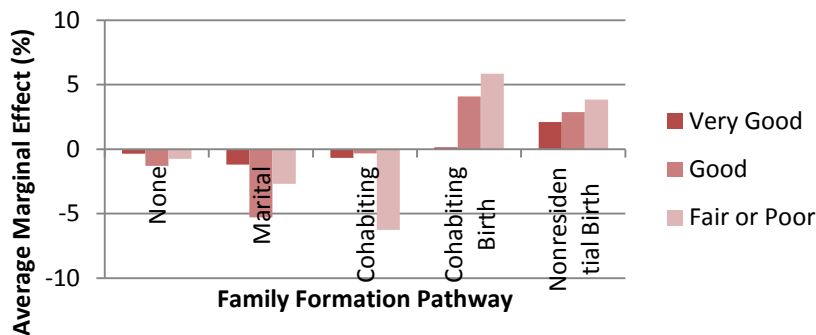
In predicting later life health, we again use cohabitation or premarital cohabitation as our reference category. Even after controlling for prior health status, we find that individuals who subsequently followed the marital pathway were significantly more likely to report being in better health in adulthood at Wave IV. Conversely, individuals who had a non-residential birth were significantly less likely to report being in excellent health in adulthood. Having a cohabiting birth is only associated with reduced likelihood of better health when differentiating the best from all worse health outcomes; having a cohabiting birth, relative to cohabitation or premarital cohabitation, is marginally significantly associated with a reduced likelihood of being in excellent rather than lower health status. Relative to cohabitation, there appears to be a

marital benefit and a non-marital birth detriment with regard to later life health. A simplified version of these findings is depicted in Figure 4.

Figure 4: Average Marginal Effects of Family Formation Pathway on Health Status, (ref=Cohabitation)
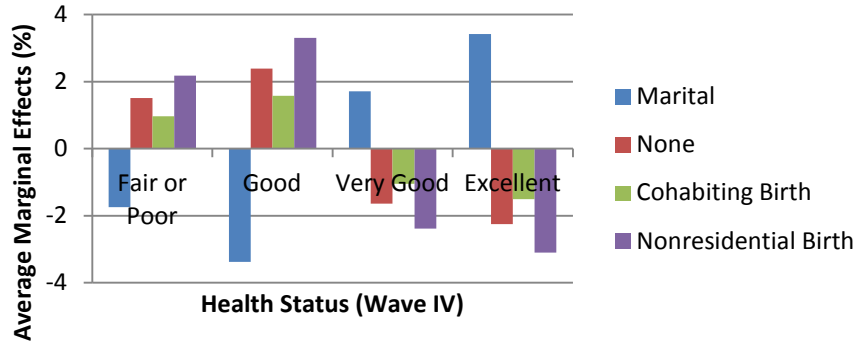
Conclusion

Taken together, we find that health is a resource on which selectivity into relationships may operate and that these relationships influence later life health. Our findings demonstrate cumulative advantage for individuals through health and relationships; women in better health are more likely to have relationship pathways that perpetuate and increase their health advantage. We find evidence for an alternative means by which social stratification may occur, through non-economic means, as differences in health result in differences in family formation, which can perpetuate existing social differences.

While the main models for the study are already completed, by PAA we will have analyzed additional sensitivity checks. In particular, we will have finished our modeling of pathway influence using pregnancy constructed measures to insure that the results are not caused by "shotgun" relationship intensification, run similar models using only women with birth histories to check possible childbearing selectivity, and have validated our birth and union formation timings using data from previous waves of Add Health.