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Family Instability and Early Childhood Health in the Developing World

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Abstract*: Research on improving children's health in lower-income countries has focused on financial resources, women's education, and public health interventions, largely overlooking the ways in which family structure may shape children's health. We use Demographic and Health Survey data to explore the relationship between family instability—measured by divorce or dissolution of a cohabiting partnership, widowhood, or forming a new partnership—and children's health in a wide variety of societies. We find family instability is associated with higher levels of diarrhea (N=244,792), poor growth (N=182,416), and child mortality (N=7,984,813 person-months) in Central/South America and the Caribbean, Africa, and Asia, but not in higher income countries in and around the Middle East. Our work also shows that unlike in Europe and North America, single mothers in lower-income countries are more likely to be socioeconomically advantaged than disadvantaged.*

Keywords:

Development or outcomes < Childhood/Children

Early childhood < Childhood/Children

Education < Economics & Stratification

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Single-parent families < Family Structure

Stepfamilies < Family Structure

Improving children's health in lower-income countries around the globe is one of the paramount goals of the international community—as articulated, for instance, in the United Nations' Millennium Development Goals. In pursuit of this goal, researchers have focused on the important roles that financial resources, women's education, public health interventions, and environmental conditions play in children's health (e.g., Gakidou, Cowling, Lozano, & Murray, 2010). But scholars have shown less interest in the role that family life plays vis-à-vis children's health. In particular, comparatively little attention has been paid to the ways in which family structure may shape the care that children in lower-income countries receive and their health.

We examine the relationship between family structure and children's health in a wide variety of societies using a measure that is known to have a negative effect on children's well-being in the United States and Europe: union instability (Bzostek & Beck, 2011; Fomby, 2013; Liu & Heiland, 2009). Whether children in non-Western societies whose mothers have experienced union instability—measured here by divorce or dissolution of a cohabiting partnership, widowhood, or repartnership—fare worse than those in stable unions is an open empirical question with little evidence to date. A recent study that started to fill this gap with evidence from sub-Saharan Africa showed that children of remarried mothers in a number of African countries were more likely to have died than children born to their mother's first and still-enduring union, even after accounting for socioeconomic factors (Clark & Hamplová, 2013). Likewise, a new study of child anemia (clinical iron deficiency) in Mexico indicates that children in Mexico are less likely to suffer from anemia if they grow up in a stable, two-parent married home, even after controlling for household economic resources (Schmeer, 2013). This new

research suggests that stable, two-parent families may foster health for children in lower-income countries around the globe.

Accordingly, we explore the association between family stability and children's health across three important outcomes: diarrhea, stunted growth, and death. Diarrhea represents an acute health crisis; it is not only a leading cause of death among children under 5, killing nearly 1 million children each year across the world, plus heavy incidence of childhood diarrhea is also associated with poor cognitive development and school performance (Lorntz et al., 2006). Stunted growth is a longer-term measure; it results from chronic nutritional deprivation or repeated episodes of poor food intake, disease, or both. Like diarrhea, childhood stunting is linked to poorer productivity later in life (Dercon & Sánchez, 2013; Hoddinott, Maluccio, Behrman, Flores, & Martorell 2008). Therefore, both of these health outcomes reflect childhood disadvantage, burdens for caretakers, and obstacles to adult success that in turn place a drag on national-level socioeconomic development. This analysis also addresses childhood death, which is associated with many of the same risk factors, and tests whether union instability is associated with childhood death in regions other than sub-Saharan Africa.

The findings detailed below suggest that union instability is associated with worse health outcomes in non-Western societies. The findings are stronger for diarrhea and death than for stunted growth. Union instability matters in Africa, Asia, and Central/South America and the Caribbean, but not the Middle East. Children of single mothers who have never experienced a union transition have fewer disadvantages than children of mothers with union instability, but there is still some evidence of disadvantage for them.

CAREGIVING & CHILDREN'S HEALTH

Environmental conditions, poor living conditions, and fewer parental resources in lower-income countries are fundamental determinants of children's health, but the research shows that so too is the direct parental care that children receive from their parents. Children who receive high levels of attention and affection are more likely to enjoy good health, net of the external factors in their environment (Mackintosh, Marsh, & Schroeder, 2002; Walker, Sterling, Hoke, & Dearden 2007). Moreover, the impact of health hazards or health resources found in the larger environment is often mediated by parental caregiving, as the UNICEF extended care model notes (Jonsson, 1995). For example, households with poor resources such as those that lack piped water may nonetheless have healthy children if caregivers take time to boil drinking water. Conversely, richer households that can afford nutrient-dense foods to help children transition away from breastmilk or infant formula may still have children who suffer if parents do not take the time to feed toddlers frequently throughout the day because the children's small stomach capacity precludes getting enough to eat from only 2-3 meals. Of course, the worst-off families who have neither piped water nor the means to compensate by routinely boiling water do not have much latitude to foster good health in their children, but in much of the lower-income world there are considerable opportunities for caregiving to matter at a wide variety of income levels (e.g., Gage 1997).

Caregiving also matters in another way: stress. Children who receive adequate food, affection, attention, and consistent discipline are less likely to be stressed (Bzostek & Beck, 2011). In turn, they are less likely to be affected by the physical ailments associated with stress (Gerson & Rappaport, 2013; Umberson, Crosnoe, & Reczek, 2010). So, when it comes to

children's health, parental caregiving matters both in shaping the kinds of resources available to children, and in protecting them from the stresses that can be debilitating to their health.

CAREGIVING AND FAMILY STRUCTURE

Caregivers' own education, health status, mental health, control over resources, available time, and social support all help determine how well they fare and in turn how effective they are in giving care (Engle, Menon, & Haddad, 1997). These factors are often related to union instability. Cherlin (2009) discusses the challenges that family instability poses to parents. More specifically, we hypothesize that union instability may:

1) be time- and attention-consuming;
2) be stressful;
3) disrupt networks of social support; and
4) reduce the socioeconomic resources available to parents.

These consequences of union instability, in turn, may make it more difficult for parents to give children the kind of consistent care they need to thrive—from the attention and affection associated with health to the medical care needed to treat an acute condition. For instance, use of health care seems to be conditioned by family structure in some countries (Gorman & Braverman, 2008; Gage, Sommerfelt, & Piani, 1997). Further, evidence from sub-Saharan Africa and the United States suggests that when parental unions are disrupted, children receive daily care from more caregivers and spend more hours away from their biological parents; both of these changes appear to be associated with poorer health outcomes (Crosnoe, Prickett, Smith, & Cavanagh, 2014; Grant & Yeatman, 2014). Mothers in non-intact families also appear to be less likely to breastfeed their infants and thus confer both short-term and long-term health benefits

(Bar-Yam & Darby, 1997; Clark & Hamplová 2013). Finally, any negative associations between union instability and children's health may be mediated by the economic dislocation that often follows in the wake of a union breakdown (McKeever & Wolfinger 2001).

CHALLENGES OF CROSS-NATIONAL COMPARISONS

Cross-national comparisons become tricky, however, because *how* care factors relate to union instability may vary between societies. That is, the socioeconomic resources or social support available in different countries may or may not buffer against the effects of union instability. For instance, in the United States, single mothers have significantly less education than do married mothers whereas in Latin America, they have significantly more (Wang, Parker, & Taylor, 2013; calculations from the current study described below). And although any path to single motherhood—non-marital childbearing, divorce or union dissolution, widowhood—usually involves a great deal of stress, social support for widows may be greater than for divorcées, especially in countries with strong marriage cultures like those in Korea or Japan (Park, 2007).

Whereas investigating all of the pathways through which family structure could influence children's health across a wide variety of societies is not possible, it is possible to determine the net association of union instability on children's health across societies around much of the globe. This is the focus of the work that follows. Nonetheless, because socioeconomic status predicts union instability differently in poorer countries than richer countries, we also pay careful attention to the ways in which controls for parental socioeconomic resources affect the links between union instability and children's health.

In particular, whereas in many rich industrialized countries today, union instability and single parent families are more common among the disadvantaged, in many lower-income countries, the pattern between privilege and family structure is quite different: it is often the most privileged women who live as single mothers. That is because, as noted in the pioneering work of William Goode, family change often happens first among elites, who have the economic resources and the educational background to experiment with nontraditional family life or to leave an unsatisfying or abusive marriage (Goode, 1963). Later, when union instability and single parenthood have become more common, they tend to be concentrated among those with less income and education, as is the case in much of the industrialized world (McLanahan 2004; Thomson, Lappegård, Carlson, Evans, & Gray, 2014).

Put differently, in some poor regions of the world, it is difficult for young women with limited education and few economic resources to raise children on their own, either before marriage or in the wake of a divorce. So women with access to comparatively little education and income tend to enjoy more stable marriages in many lower-income countries. To pick an example from Latin America, the Lenca in Honduras are one of the least educated ethnic groups in the country; they also do not participate much in the modern economy and have few economic resources. It is very difficult to imagine a Lenca woman divorcing and raising a child independently given her few employment options, and Lenca marriages are relatively stable (Kendell, 1983; Rowlands, 1997; Zell, 2013). By contrast, highly educated women in Honduras are more likely to have children on their own or divorce (calculations described below). Similarly in sub-Saharan Africa, the poorest tend to drop out of school before puberty and marry shortly after, concentrating the risk of nonmarital childbearing among the better-off who stay in school and marry later (Lloyd & Mensch, 2008). These examples illustrate why in poorer

countries never-married and divorced mothers are typically of higher status than their counterparts who have remained married, or have repartnered, or are widowed, as seen in Figure 1.

As a result, in low-income countries single motherhood and family instability are *not* systematically associated with lower socioeconomic status. This is noteworthy because differential health outcomes associated with family instability, then, may not be a consequence of material or social deprivation on the part of mothers. That is, because single mothers tend to have more education than their married peers in lower-income countries, their children may not suffer as many material and social disadvantages as they would if their mothers were less educated.

DATA

We use data from the Demographic and Health Surveys (DHS) and include countries of Central/South America and the Caribbean, Africa, the Middle East and surrounding area, and Asia. Specifically, the data for Central/South American & Caribbean come from Bolivia (2008), Colombia (2010), Dominican Republic (2007), Haiti (2012), Honduras (2011-12), and Peru (2012); the data for Africa are from Cameroon (2011), Chad (2004), Congo Democratic Republic (2007), Ethiopia (2011), Ghana (2008), Kenya (2008-09), Nigeria (2008), Tanzania (2010), and Uganda (2011); the data for the Middle East and surrounding area come from Azerbaijan (2006), Egypt (2008), Jordan (2009), Morocco (2003-04), Turkey (2003), Uzbekistan, and the data for Asia come from Bangladesh (2011), India (2005-06), Indonesia (2012), Pakistan (2006-07), the Philippines (2008), Vietnam (2002).

The DHS survey team administered the individual woman's questionnaire to a nationally representative sample of reproductive-aged women in each country; the questionnaire included a complete birth history (including children who had died) as well as current health measures. We utilize the children's health data in the individual women's interviews because it is more extensive than that collected by the DHS household roster, plus it also permits us to utilize union data collected only if the mother was interviewed. We verified that the sub-sample of children with interviewed mothers was representative of all children living with their biological mother with respect to childhood growth. Our analyses include all children born in the 5 years before the survey.

METHOD

Key independent variable

Although the data are cross-sectional, they can nonetheless be used to assess the relationship between union instability and children's health outcomes under some reasonable assumptions. First, it is possible to identify children whose mothers have experienced no union transitions in their lifetimes, namely those whose mother have been continuously in their first union from before their birth until the survey (determined using the date of the child's birth, the date of the mother's first union, and the number of unions the mother has been in) and those whose mother has never been in a union (either married or cohabiting). Children born during their mother's first and still-enduring union likely have biological parents who are still together, even though some do not live with both biological parents (for example, their father may be a migrant laborer). In contrast, children born to mothers who have never been in a union are much less likely to have their biological fathers involved in their lives, but their mothers also have not

experienced union instability (even the breakup of a cohabiting union). Women who have never been in a union were not included in most of the DHS in the Middle East (which interviewed ever-married women rather than reproductive-aged women as in the other regions' DHS), and therefore there is no "never in union" category for these countries. Note also that nonmarital childbearing in the Middle East is virtually nonexistent (Mahler & Rosoff, 1998 concluded that what little data is available from the Middle East supports the claim that abstinence before marriage is commonly practiced). See Table 1 for the distribution of mothers across the union categories in world regions.

Children whose mothers have experienced union instability may be either single or repartnered at the time of the DHS interview. The currently single with a history of union instability include those who have been divorced, have experienced the dissolution of a cohabiting partnership, or have been widowed (we analyze the widowed separately). Mothers who are separated from their partners are counted as divorced, whereas those who simply do not live with their partners but the union is ongoing are either continuously in first union or repartnered.

Our union categories are continuously in first union (reference), never in union, divorced, widowed, and repartnered/newly partnered (more than one union or child born before the only union). Union instability could have preceded the child's birth (e.g., the child was born after the mother divorced), so it is much more accurate to think of these categories as representing the mother's union instability rather than union instability during the life of the child. In fact, some of the children of repartnered women may live with their biological fathers as the DHS data do not provide union dates other than for first union, and therefore it is not possible to determine whether children of repartnered women were born during the current union.

Dependent variables

We use three health outcomes: recent diarrhea (an indicator of acute illness), stunted growth (an indicator of long-term health, measured as being more than 2 standard deviations below the median of a healthy reference population), and death (the most extreme health outcome, regardless of cause). This diverse set of measures allows us to determine whether union instability is associated with different domains of child health. Additionally, although children's health conditions can contribute to union instability (Kaaresen, Rønning, Ulvund, & Dahl, 2006), there is little concern that an episode of diarrhea in the 2 weeks before an interview has caused previous union transitions—in contrast to a child's death that might destabilize a marriage.

Analytic approach

We use logistic regression models to analyze the likelihood of recent diarrhea and childhood stunting. Our control variables include those known to influence health through biological channels but for which the distribution may vary according to union status: birth order (first births are the reference, compared to mid-order (1-5) and high order (6+)), short preceding birth interval (less than 24 months), whether the child has dead siblings, maternal age (teens (reference), twenties, thirties, forty and older). Similarly, we control for variables related to socioeconomic conditions because again their distribution may vary with union status: urban residence, maternal education level, and a household asset index (see details in Giroux 2008; we chose an absolute wealth index over the DHS-provided relative wealth index because we wanted it to have the same meaning across countries when we pooled data). We include the child's gender because of both biological effects and differences in caregiving practices that may vary with the child's gender regardless of union status. We also include dummy variables for each region of each country to represent health conditions that would affect all children. Additional

household structure variables that could impact caregiving are: the presence of women other than the mother, presence of men other than the mother's partner, the number of children under age 5, and the number of children aged 5-15 (with slight adjustments for Pakistan that did not have a detailed household roster).

There were 261,703 living children under age 5 across all countries. Stunting data were not available for Indonesia, Pakistan, the Philippines, and Vietnam, bringing the potential sample size for that analysis down to 229,127. Many children were not measured by the DHS survey team, 46,273 or 20.2% of the potential sample. Of the 182,854 with valid stunting data, an additional 438 (0.24%) were dropped for missing values on other variables. Sample size is larger for the diarrhea analysis because it is based on a question asked of the mother about whether the child had diarrhea in the past 2 weeks; it did not require that the child be present at interview. The question was not asked in Jordan and Turkey, yielding 248,303 potential cases. 2895 (1.17%) were missing diarrhea data and an additional 616 (.25%) were dropped for missing values on other variables.

The childhood death model is quite similar except that the outcome is whether the child lives or dies in every month from their birth to either their death or the interview (it is a discrete-time event history model that follows Clark & Hamplová's (2013) work on single motherhood and childhood death in Africa very closely, including a statistical correction for correlated observations between siblings). Child's age is included as an additional control, grouped to capture variation in the risk of childhood death (the first month of life is the reference category, then 1-11 months, 1 year, 2 years, and 3-4 years). The number of children under age 5 in the household must be omitted in the death analysis because that count is influenced directly by death (there are fewer children under 5 living in the household if a child has died in the past 5

years). It is retained for diarrhea and stunting because young children may compete for resources and spread disease among themselves.

Unlike for the stunting and diarrhea analyses, the sample for the childhood death analysis is not limited to children living with their biological mother at the time of the interview as retrospective information was gathered on all live births from interviewed women. Out of 8,008,438 potential person-months, 23,615 (.30%) were dropped for missing data.

RESULTS

Education and Union Instability

The findings indicate that in poor countries single motherhood is not systematically associated with material disadvantage; indeed, our results suggest that mothers with more resources may feel freer to remain single. The Middle East and surrounding area resembles rich countries in that mothers in their first union have the most education; union instability is more characteristic of less educated segments of the population (Figure 1). The pattern in the other three regions is quite different: mothers who have never been in a union and those who have divorced or dissolved a union (and are currently single) have the most education. Repartnered and widowed mothers do have less education than mothers whose child was born in their first union. The difference in years of education between mothers continuously in their first union and all other categories is statistically significant in every region except that widowed mothers do not have significantly less education in Africa. This is likely because HIV death is not as concentrated among the poor as other causes of death are. The key finding from Figure 1 is that in Central/South America and the Caribbean, Africa, and Asia, single mothers besides widows are of higher education than mothers living with partners. We tried substituting the asset index

for maternal education and the pattern of the results was almost exactly the same (not shown). Therefore, single mothers besides widows are of generally higher socioeconomic status than mothers living with partners.

Patterns in Child Health Outcomes

Although our focus here is on the effects of union instability on children's health, our other results are in keeping with established findings regarding children's health. First, health outcomes vary widely within world regions. Some of this variation is between countries, but health outcomes also varied significantly between regions *within* countries. The region variables pick up much of the geographic variation typically associated with urban residence. Second, socioeconomic status clearly matters: children in wealthier households and those with more educated mothers both had better health outcomes. Mother's education was insignificant for diarrhea in Asia and the Middle East and also for death in the Middle East; it was significant for all other outcomes in all regions. The household asset index was always statistically significant. Third, boys were at higher risk of death everywhere, and more likely to have had recent diarrhea everywhere but the Middle East and surrounding area. Boys were also more likely to be stunted in Central/South America and the Caribbean, Africa, and the Middle East and surrounding area, but less likely to be stunted in Asia.

Just as previous research has established, children everywhere were most likely to die in the first month of life, and also, if they were their mother's first child. In Asia and Central/South America, children after the first born were more likely to have stunted growth. Both death and stunting were more likely among children born less than 2 years after the most recent sibling, or if any of a child's siblings had died. Children of mothers over 20 had better health outcomes

across all three measures than those of teen mothers, except children of mothers in their forties were not less likely to die than children of teen mothers.

Although the effects of others in the household (adult women, adult men, other children) besides parents are not completely consistent, they seem to suggest that living with extended family helps protect children from having stunted growth.

Union Instability and Diarrhea

The most consistent result from the acute illness analysis is that children with repartnered mothers are more likely to have had recent diarrhea than those born to continuously married mothers (far right bars, Figure 2). Only in the Middle East and surrounding area was the relationship between mother's repartnering and acute illness insignificant. In the other three regions, children of repartnered mothers were significantly more likely to have had recent diarrhea. In Central/South America and the Caribbean the disadvantage associated with having a repartnered mother was relatively small: it increased the chance of recent diarrhea by about 7 percent. In Africa and Asia, the effects were larger with recent diarrhea being 16 percent and 35 percent more common among children of repartnered mothers than among children born to mothers continuously in their first union.

In contrast, children of widows are not at a disadvantage anywhere. Moreover, children of widows in Africa are less likely to have diarrhea, compared to children in families where the mother was never in a union. Children of divorced mothers are about 17 percent more likely to have had recent diarrhea in both Africa and Central/South America and the Caribbean.

Children of mothers who have never been in a union comprise 0.2 percent of children in Asia and an unknown percentage in the Middle East, where all but one of the surveys was of ever-married women rather than reproductive-aged women (Table 1). Thus the association

between having a never-partnered mother and poorer health is meaningful only for Africa and Central/South America (with almost 3 percent of children and over 6 percent of children, respectively). In both these regions, children of never-partnered mothers have significantly more recent diarrhea (20 percent more and 14 percent more, respectively).

Union Instability and Stunting

Turning next to childhood growth, children of never-partnered mothers in Central/South America and the Caribbean are more likely to have stunted growth than children born to mothers continuously in their first union; this is not the case in Africa (Figure 3). Again, children are very rarely raised by mothers who have never been in a union in the other 2 regions. Children of divorced mothers or those whose unions have dissolved are more likely to be stunted in Central/South America and the Caribbean (12 percent more likely), Africa (18 percent more likely), and Asia (52 percent more likely). Widowhood is associated with more childhood stunting only in Central/South America and the Caribbean. In contrast to the results for recent diarrhea, repartnering is not associated with childhood stunting anywhere.

Union Instability and Death

Finally, we turn to child survival, an unequivocally important measure of child well-being. Mothers who have experienced union instability in some regions are more likely to have had a child die, regardless of whether they have divorced or dissolved a partnership, are widowed, or are in a union at the time of the interview (Figure 4). In all regions except the Middle East, children of mothers who have divorced or dissolved a partnership are about 30 percent more likely to have died, and children of widows were in Africa 20 percent more likely and in Asia 43 percent more likely to die. Children of repartnered mothers face a 20-34 percent elevated death risk in regions besides the Middle East. The results for deaths of children born to

never-partnered mothers follow the exact same pattern as for stunting: children of never-partnered mothers in Africa and Asia are no more likely to have died, but in Central/South America and the Caribbean, they are 30 percent more likely to have died.

These elevated death risks of course matter more in absolute terms where childhood death is most frequent. In Africa, where 9.1 percent of children born in the 5 years before the interview had died, a death rate 30 percent higher than the regional average means about 12 percent of children will die. By contrast, in Asia, 30 percent higher is the difference between 5.1 percent and 6.6 percent of children dying, and in Central/South America between 3.1 percent and 4.1 percent.

DISCUSSION

In our analysis, mothers' union instability seems to matter less for children's health in and around the Middle East than in other regions. It is possible that there were no significant effects simply because health is generally better there and most mothers are in their first marriage: rare events occurring to small portions of the population limit statistical power. The fact that the estimated effects of divorce or partnership dissolution, for instance, are quite similar in all regions but fail to achieve statistical significance in the Middle East supports this interpretation. (The estimated effects of remarriage are similar for diarrhea and stunting, but not death.)

In the other three regions, union instability matters. It seems to matter the most in Central/South America and the Caribbean where, compared to children born during their mother's first and continuing union, children of divorced mothers were significantly worse off across all three health outcomes, and children of widowed or repartnered mothers were worse off

in two of the three outcomes. It is also in Central/South America and the Caribbean that children whose mothers have never been in a marital or cohabiting union have poor health outcomes: more diarrhea, more stunting, and more death. In Africa, children whose mothers have never been in a union have only more diarrhea; in Asia, they are not disadvantaged for any of the health outcomes, though there are so few children in this category in Asia that accurate comparisons may not be possible.

It also appears that having a mother who divorced or dissolved a union is associated with the worst outcomes, but if we discount stunting—the outcome where union status overall had the weakest impact—the results for children of mothers who have divorced or dissolved unions and repartnered are remarkably similar. The fact that some children of repartnered mothers are children of second unions who live with both biological parents makes the disadvantage associated with repartnering all the more striking: both the economic advantages associated with two-parent homes and the other advantages to living with both biological parents would make it unlikely that we would find a significant disadvantage for children of repartnered mothers, and yet we find it for both recent diarrhea and child death in Africa, Asia, and Central/South America and the Caribbean. Remarriage does seem to protect children from having stunted growth, however.

With an outcome like child death, it is very easy to imagine the outcome destabilizing the mother's union rather than a union transition leading to the child's death. However, studies with data that can establish the order of events indicate that marital instability precedes child death (Alam, Saha, Razzaque, & van Ginneken, 2001, Bhuiya & Chowdhury 1997, Sear, Steele, McGregor, & Mace, 2002). The results here also indicate that marital instability often likely comes first: diarrhea within 2 weeks of the interview is unlikely to have caused union transitions,

and children of mothers who have divorced /dissolved their unions or repartnered often have more recent diarrhea, just as they are more likely to have died.

Note also that Figures 2 through 4 indicate that children with never-partnered single mothers do about as poorly in Central/South America and the Caribbean as do children in families marked by union instability. This finding suggests that in some cases it is not instability alone that matters for children's health, but also having access to two (stably partnered) parents.

Taking differences in socioeconomic status into account did little to alter the association between a mother's union status and any of her children's health outcomes. In richer countries, part of the disadvantage associated with single parenthood and union instability can be explained by socioeconomic status (e.g., Bramlett & Blumberg, 2007), but in these data differences by union status are instead marginally (not significantly) *enhanced* when controlling for socioeconomic status.

Finally, the association between union instability—specifically, divorce or union dissolution and repartnering—and children's health is greater than that of an additional level of maternal education when it comes to diarrhea and death. For instance, African children whose mother has completed primary school are about 10 percent more likely to have had recent diarrhea or to have died than those whose mothers have completed secondary school, whereas children of mothers who have divorced or dissolved unions or repartnered women are about 16 percent more likely to have had recent diarrhea and about 26 percent more likely to have died. In Central/South America and the Caribbean, incidence of recent diarrhea is about the same between children of stably married primary-educated women and those of secondary education women who have divorced or dissolved unions or repartnered, but children in the latter group face a greater risk of death is greater, even with the mothers' educational advantage. In Asia, the

health benefit associated with an additional level of education is smaller than the deficit associated with union instability.

Overall, the analyses find the best health outcomes for children whose mothers have been in their first union for the children's entire lives. In some ways this simply extends findings from wealthier countries that show advantages in multiple domains for children who live with both biological parents and who have not experienced the stress associated with union transitions. The data also indicate there may be health disadvantages associated with having a mother who has undergone union transitions, even if they were not during the child's lifetime. Because the children in our sample are under 5 years old, many of them are products of the mother's current union. Further analyses could test whether a mother's previous union instability reduces the health benefits associated with marriage in wealthy and poor countries alike.

CONCLUSION

Policymakers, NGOs, and scholars have devoted substantial attention to understanding and addressing the environmental, economic, and educational challenges affecting children's health in lower-income countries around the globe. Our work suggests that the family contexts of caregiving also deserve attention in ongoing efforts to improve children's health around the world. In Asia, Central/South America and the Caribbean, and sub-Saharan Africa, children raised by mothers who have experienced union instability are more likely to have health problems, especially diarrhea, and to die than children raised by a mother who has remained in her first union since before their birth. The results found in this study suggest that family instability may compromise parents' ability to provide the kind of consistent and attentive care that is most likely to foster good health in children. Accordingly, international efforts to improve

children's health should also explore ways to stabilize the contexts of family care—assuming parents do not have high-conflict relationships—and to help children whose care is compromised by family instability.

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Table 1: Distribution of Children Under 5 by Mother's Partnership Status

Region	Mother continuously in first union	Mother never in union	Mother repartnered/newly partnered	Mother divorced	Mother widowed
Africa	75.9%	2.9%	15.4%	4.3%	1.5%
Asia	94.0%	0.2%	3.9%	1.2%	0.8%
Middle East & surrounding countries	95.4%	n/a	2.8%	1.1%	0.7%
Central/South America & the Caribbean	60.3%	6.2%	20.8%	11.9%	0.8%

Table 2: Logistic Coefficients for Health Outcomes

		Africa			Asia	
	diarrhea	stunting	death	diarrhea	stunting	death
Union categories (ref=continuously in first union)						
Never in union	0.18**	-0.01	-0.02	0.38	0.25	-0.01
Divorced	0.17***	0.16**	0.23***	0.16	0.42***	0.26*
Widowed	0.20*	0.10	0.181*	-0.12	-0.05	0.36*
Repartnered/newly partnered	0.15***	0.02	0.24***	0.30***	0.08	0.29***
Child's age (ref=<1 month)						
1-11 months			-2.40***			-3.04***
1 year			-2.87***			-4.30***
2 years			-3.15***			-4.68***
3-4 years			-3.70***			-4.95***
Residence (ref=rural)						
Urban	0.05	0.23***	-0.08*	0.06	-0.01	-0.03
Child’s Gender (ref=female)						
Male	0.09***	0.16***	0.15*	0.17***	-0.05**	0.10**
Birth order (ref=first)						
Second-Fifth	0.07*	-0.01	-0.38***	0.04	0.11***	-0.54***
Sixth and higher	0.17***	0.00	-0.38***	0.19***	0.21***	-0.69***
Preceding birth interval (ref >=24 months)						
<24 months	0.01	0.31***	0.50***	-0.03	.29***	.54***
Sibling mortality (ref=none)						
One or more dead siblings	0.14***	0.05*	0.63***	-0.03	0.04	0.79***
Maternal age (ref=teens)						
20s	0.08*	-0.11***	-0.28***	-0.15***	-0.35***	-0.26***
30s	-0.25***	-0.20***	-0.25***	-0.33***	-0.48***	-0.18**
40s	0.24***	-0.29***	-0.12	-0.46***	-0.26*	-0.23
Maternal education	0.06***	-0.14***	-0.06***	0.00	-0.18***	-0.14***
Asset index	0.05***	-0.09***	-0.04***	-0.03***	-0.09***	-0.04***
Other women in household (ref=none)						
One or more	0.10***	0.02	0.07*	0.06	-0.14***	-0.02
Other men in household (ref=none)						
One or more	0.08**	-0.08**	0.04		-0.08**	
Number of children <5	-0.04**	-0.05***		-0.04*	0.02	
Number of children 5-15	0.02*	0.03***	-0.01		0.06	
Constant	1.72***	-0.21	-3.37***	-2.17***	0.00	-3.97***

n	79,894	56,737	2,478,764	84,806	45,629	2,638,566
	Central/South America & the Caribbean			Middle East and surrounding countries		
	diarrhea	stunting	death	diarrhea	stunting	death
Union categories (ref=continuously in first union)						
Never in union	0.13**	0.14*	0.26*			
Divorced	0.17***	0.11*	0.30***	0.19	0.09	0.27
Widowed	-0.18	0.35*	0.32	-0.56	0.26	0.19
Repartnered/newly partnered	0.07*	0.02	0.18**	0.25	-0.06	0.00
Child's age (ref=<1 month)						
1-11 months			-2.90***			-2.97***
1 year			-4.08***			-4.46***
2 years			-4.84***			-5.52***
3-4 years			-5.00***			-5.13***
Residence (ref=rural)						
Urban	-0.03	-0.09**	0.07	0.20	-0.03	-0.03
Child’s Gender (ref=female)						
Male	0.10***	0.09***	0.14**	0.04	0.14***	0.30***
Birth order (ref=first)						
Second-Fifth	0.03	0.11**	-0.14*	0.07	-0.04	-0.26**
Sixth and higher	0.09	0.33***	-0.16	0.13	-0.04	-0.48**
Preceding birth interval (ref >=24 months)						
<24 months	-0.07	0.24***	0.45***	-0.07	0.31***	0.34***
Sibling mortality (ref=none)						
One or more dead siblings	0.07	0.16***	0.69***	-0.01	0.14*	1.30***
Maternal age (ref=teens)						
20s	-0.12***	-0.14***	-0.16*	-0.20*	-0.11	-0.22*
30s	-0.36***	-0.33***	-0.19*	-0.28*	-0.19*	-0.29*

40s	-0.51***	-0.32***	0.04	-0.32	-0.29*	-0.03
Maternal education	-0.05***	-0.25***	-0.08***	0.03	-0.07***	-0.04
Asset index	-0.03***	-0.14***	-0.03***	-0.04	-0.09***	-0.05**
Other women in household (ref=none)						
One or more	0.03	-0.11**	-0.06	0.06	-0.09*	0.10
Other men in household (ref=none)						
One or more	0.05	-0.12***	0.01	-0.02	0.13	0.15
Number of children <5	0.00	0.20***		-0.11**	0.02	
Number of children 5-15	0.00	0.09***	-0.01	-0.03	0.09***	0.01
Constant	-1.43***	-1.01***	-3.44***	-2.05***	-0.37	-2.97***
n	61,056	54,865	1,899,758	19,036	25,185	967,725

* p≤0.05. ** p≤0.01. *** p≤0.001. All models include dummy variables for each region of each country

FIGURE 1 Education and Union Stability

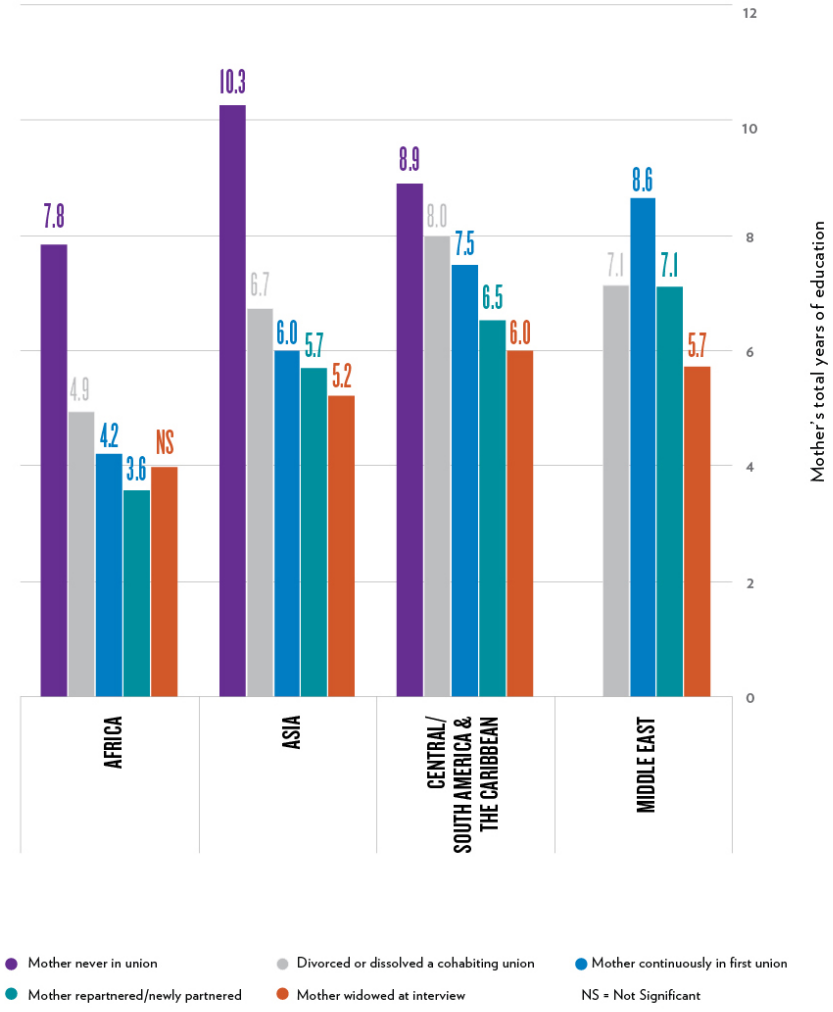

FIGURE 2 Children of Repartnered Mothers Have More Diarrhea in Three Out of Four Regions, Accounting for Background Factors

Children of mothers who were never in a union, divorced, or dissolved a cohabiting union also at a disadvantage in Central/South America and the Caribbean and Africa

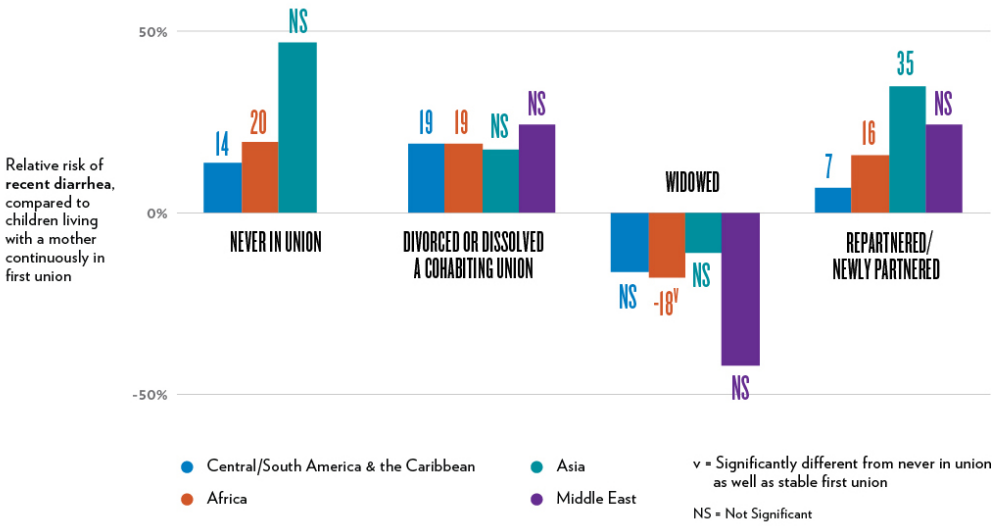

FIGURE 3 Children of Mothers Who Divorced or Whose Union Dissolved More Likely to Have Stunted Growth in Three Out of Four Regions, Accounting for Background Factors

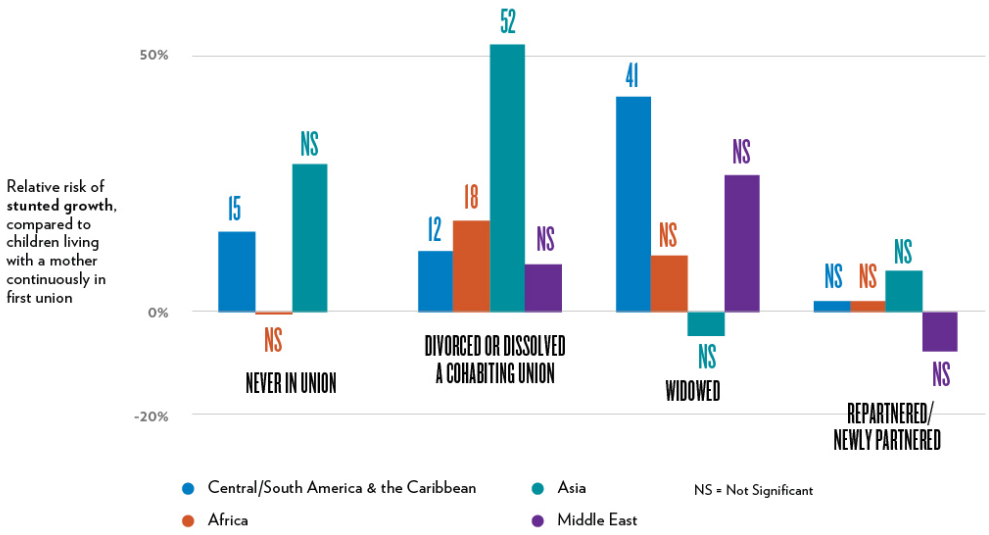

FIGURE 4 Children of Mothers Who Divorced, Dissolved a Cohabiting Union, and/or Repartnered More Likely to Have Died inThree Out of Four Regions, Accounting for Background Factors