

## **What Explains Divorced Women’s Poorer Health? The Mediating Role of Health Insurance and Access to Health Care in a Rural Iowan Sample\***

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**ABSTRACT** Economic restructuring in rural areas in recent decades has been accompanied by rising marital instability. To examine the implications of the increase in divorce for the health of rural women, we examine how marital status predicts adequacy of health insurance coverage and health care access, and whether these factors help to account for the documented association between divorce and later illness. Analyzing longitudinal data from a cohort of over 400 married and recently divorced rural Iowan women, we decompose the total effect of divorce on physical illness a decade later using structural equation modeling. Divorced women are less likely to report adequate health insurance in the years following divorce, inhibiting their access to medical care and threatening their physical health. Full-time employment acts as a buffer against insurance loss for divorced women. The growth of marital instability in rural areas has had significant ramifications for women’s health; the decline of adequate health insurance coverage following divorce explains a component of the association between divorced status and poorer long-term health outcomes.

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### Introduction

In recent decades, families in rural areas have endured sweeping changes in local economies. Along with the loss of the majority of family farms over the second half of the twentieth century (with particularly rapid losses in the farm crisis of the 1980s), rural communities experienced a simultaneous erosion of manufacturing jobs and rapid increases in poverty and unemployment (Lichter and McLaughlin 1995; MacTavish and Salamon 2004). Although some families fled rural areas as economic prospects deteriorated, many others remained, and coped. In the wake of these macroeconomic changes, rural families themselves underwent a destabilizing transformation (Tickamyer and Henderson 2004). In a departure from their historically more traditional family norms and structures, rural families have experienced a significant retreat from marriage and rise in marital instability, yielding similar family patterns in rural and urban areas by the end of the twentieth century (Albrecht and Albrecht 2004; Lichter and McLaughlin 1995; MacTavish and Salamon 2004; McLaughlin, Gardner, and Lichter 1999; McLaughlin, Lichter, and Johnston 1993; Snyder and McLaughlin 2004). Such changes are consistent with a body of literature showing that economic strain is associated with divorce (Amato 2010).

Because families exert a powerful influence on health, the rise in divorce in rural areas has potential health ramifications for rural women (Carr and Springer 2010; Koball et al. 2010). Family demographers have documented that divorced men and women have, on average, poorer physical health and higher mortality rates than their married, never-married, and widowed counterparts (Amato 2010; Carr and Springer 2010; Koball et al. 2010; Liu and Umberson 2008; Schoenborn 2004). Although healthy women are more likely to remain married than to divorce, evidence from longitudinal data suggests that some women also undergo a decline in physical health following divorce, in both national (Hughes and Waite 2009; Liu 2012) and rural samples (Lorenz et al. 2006). While many past studies document an association between divorce and women's poorer health outcomes, a major unresolved question concerns the mechanisms whereby divorce may cause poorer health (Carr and Springer 2010).

Two major theoretical perspectives have been proposed to elucidate this association. The crisis model suggests that the interpersonal conflict preceding divorce, the marital dissolution itself, and the ensuing life changes following divorce may cause psychological distress, in detriment to physical health (Amato 2000; Booth and Amato 1991; Williams and Umberson 2004). In contrast, the resource model argues that marriage

confers financial resources, as well as social and emotional support, to married individuals (Hahn 1993; Joung et al. 1997). These resources, which may reduce one's stress and associated illness or permit healthier lifestyles or access to medical care, are often diminished in the wake of divorce, especially for women (Holden and Smock 1991; Koball et al. 2010; Smock 1994).

While some studies find that the crisis model accounts for health differentials between married and divorced individuals (e.g., Williams and Umberson 2004), other studies suggest that women's decreased material well-being after divorce plays a more central role in determining their health outcomes (Hahn 1993; Joung et al. 1997). However, few of these studies have traced the impact of divorce on health outcomes through the mediating mechanisms proposed by the resource model. Additionally, only a handful of studies have examined disadvantage in female-headed families in rural areas (for exceptions, see Snyder and McLaughlin 2004, and Turner 2006), and none to our knowledge examine the physical health ramifications of divorce. Because rural divorced women have lower levels of economic well-being, greater poverty, less access to well-paying jobs, and less access to medical care than women in metro areas, examining divorce and health in this context may be particularly important (Brown and Lichter 2004; Jensen, McLaughlin, and Slack 2004).

This study advances our understanding of the linkage between divorce and poor health in rural areas by examining whether policy-relevant pathways associated with health insurance and access to health care can explain a proportion of the association. Using the resource perspective, this study follows a panel of married and recently divorced women in rural Iowa over 10 years to examine how change in marital status predicts adequacy of health insurance coverage and health care access, and whether these factors may account for a component of the association between divorce and later illness.

## **Literature Review**

### **Marital Status and Health Insurance**

Examining the connection between marital status and health insurance coverage is important in order to understand the effects of divorce on subsequent health outcomes. In rural areas, as in the nation as a whole, divorced and separated women are at a substantially higher risk of being uninsured; some studies suggest that the risk for single women is more than twice that of married women (Hummer et al. 2004; Jovanovic, Lin, and Chang 2003; Meyer and Pavalko 1996). A key mechanism linking

women's marital status and health insurance may be husbands' access to employer-based coverage. Roughly one in four women ages 18 to 64 is insured as a dependent on a family member's (typically a husband's) employer-based health insurance policy (Kaiser Family Foundation 2011b). Because of the lower proportion of jobs offering health benefits in rural areas (Larson and Hill 2005; National Advisory Committee on Rural Health and Human Services 2008; Ziller, Coburn, and Yousefian 2006), somewhat fewer rural women may receive health insurance through their husbands' employers, but many are nonetheless vulnerable to insurance loss upon divorce.

Because married women may have multiple avenues through which to acquire health insurance—through their husbands' jobs, in addition to their own jobs or through alternative avenues—some scholars have conceptualized marriage as an insurance “safety net” for women (e.g., Meyer and Pavalko 1996). This safety net may provide extra security during transitions into, within, and out of the workplace; it may allow women to have both primary and secondary insurers; or it may provide women with multiple insurance plan options from which to choose (Meyer and Pavalko 1996; Short 1998; Wood, Goesling, and Avellar 2007). Women who divorce lose this safety net, and as single women face a higher ongoing likelihood of being uninsured than they had as married women (Jovanovic et al. 2003; Meyer and Pavalko 1996).

Family transitions are often periods of increased vulnerability for family members. Just as job loss is frequently accompanied by changes in health insurance coverage (Gruber and Madrian 1997), marital dissolution also puts health insurance at risk (Lavelle and Smock forthcoming; Zimmer 2007). This risk is particularly threatening for women, who are as likely to lose their health insurance coverage after a change in marital status as they are after a job change in the family (Short 1998). Research also suggests that divorced women who retain their insurance coverage may face a higher likelihood of underinsurance, including benefit limits, gaps in coverage, and high deductibles or copayments that hinder access to medical care (Raiz 2006). Specifically, women, individuals in single-adult households, lower-income adults, and less healthy adults have been shown to have higher rates of underinsurance than their respective counterparts (Oswald et al. 2005; Schoen et al. 2008). Divorce compounds the risk of underinsurance for women in rural areas, as rural populations already face an elevated risk (Ziller et al. 2003).

### **Full-Time Employment and Health Insurance**

Conceptualizing marriage as a health insurance safety net for women experiencing a transition in employment status exposes an obvious vul-

nerability. Because of the increasing age at first marriage, the declining universality of marriage, and the frequency of divorce (Raley and Bumpass 2003; Schoen and Standish 2001; Teachman, Tedrow, and Crowder 2004), this safety net is becoming more and more tenuous. Reversing this conceptualization, we propose that full-time employment may serve as a safety net for women experiencing a transition in marital status. This is consistent with Lavelle and Smock (forthcoming), who find that women with stable long-term employment do not experience a significant decline in the probability of insurance coverage after divorce, in contrast to their peers. Indeed, employed women are more likely to hold health insurance than unemployed women (Meyer and Pavalko 1996) and full-time workers are more likely than part-time workers to be insured (Kaiser Family Foundation 2011a).

Unfortunately, recent decades of economic restructuring have left fewer and fewer jobs in rural areas that provide workers with health insurance. The erosion of the manufacturing industry and rise in service-sector jobs in rural areas has meant a loss of high-quality jobs and an increase in low-wage work with poor benefits (National Advisory Committee on Rural Health and Human Services 2008). Tickamyer and Henderson (2004:111) note the catch-22: “[R]ural women’s labor has increased . . . at the same time that their communities have suffered from economic contraction, deindustrialization, or restructuring, making their labor both more necessary and less rewarding.” Despite this, some jobs remain in rural areas that provide health insurance benefits, and these likely help preserve health insurance coverage for women after marital dissolution.

### **Health Insurance, Access to Health Care, and Health Outcomes**

The purpose of health insurance coverage is to ensure sufficient access to medical care, and to protect individuals and families from the financial burden associated with serious medical problems. Inadequate health insurance, whether uninsurance or underinsurance, thus undermines access to care (Ayanian et al. 2000; Berk, Schur, and Cantor 1995; Jovanovic et al. 2003). Schoen and colleagues (2008) found that 53 percent of the underinsured and 68 percent of the uninsured reported forgoing at least one needed medical service or treatment during 2007, roughly twice the proportion among the adequately insured (31 percent). The inadequately insured are also significantly more likely to delay preventive care and to skip doses or not fill a prescribed medication because of cost (Jovanovic et al. 2003; Kaiser Family Foundation 2011b; Schoen et al. 2008; Weissman et al. 1991). Some evidence addi-

tionally suggests that the inadequately insured may receive poorer-quality care than their insured counterparts (Schoen et al. 2008). Moreover, the uninsured and the underinsured face similarly high rates of financial stress relating to medical costs (Schoen et al. 2008).

In addition to improving access to high-quality health care and reducing financial stress (and in part as a result of this), health insurance is also strongly correlated with positive health outcomes in the general population, and has been shown to improve the health of vulnerable subpopulations (Levy and Meltzer 2008). Rural divorced women are vulnerable along multiple dimensions: both their marital status and their geography are associated with poorer average health status and greater economic disadvantage than the overall population. Some evidence further suggests that the disadvantage imposed by marital status and geography may be multiplicative, with the greater economic hardship single women face relative to married women being greater in rural areas (Brown and Lichter 2004). Being uninsured thus may lead to further health deterioration.

Being uninsured compounds the other difficulties in obtaining access to care in rural areas. Many rural areas in the United States suffer from inadequate and deteriorating health infrastructures, and a corresponding shortage of physicians, nurses, and other medical personnel (Morton 2004; National Advisory Committee on Rural Health and Human Services 2008; Ziller et al. 2003). As a result, rural residents in need of medical care often face problems with appointment scheduling, may be required to travel long distances to find appropriate specialists and medical services, and may lack public transportation options to reach those services (Glasgow, Morton, and Johnson 2004). In this context, uninsurance and inadequate insurance coverage pose yet another barrier to gaining access to health care for rural divorced women.

### **This Study**

This study traces the impact of divorce on health through the mediating pathways of inadequate health insurance and lack of access to health care. In doing so, it builds on previous analyses by Lorenz and colleagues (2006), which demonstrated that Iowan women who divorced between 1989 and 1990 had significantly more illnesses in 2001 than did a parallel sample of continuously married women. To extend their analyses, the model in Figure 1 presents hypotheses about the mediating pathways.

In Figure 1, the significant total effect of divorce on illness found by Lorenz et al. (2006) is expected to decline or become nonsignificant ( $\beta_{41} = 0$ ) when the mediating pathways are introduced. In the elaborated

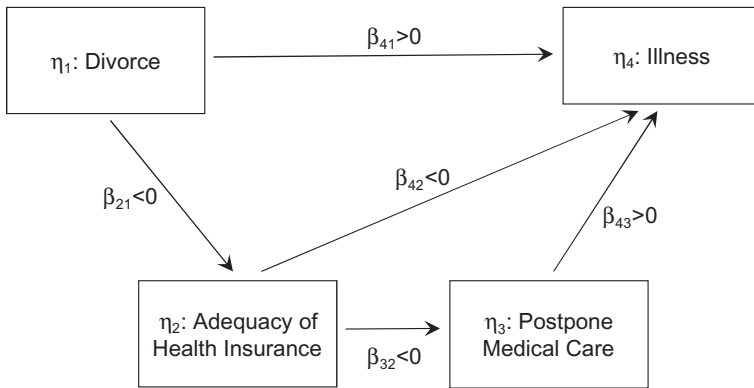


Figure 1. The Hypothesized Pathway from Divorce to Subsequent Illness as Mediated by Adequacy of Health Insurance and Postponement of Medical Care.

model, divorced women are expected to report having adequate health insurance less often than married women ( $\beta_{21} < 0$ ), which in turn we hypothesize will lead to more illnesses both directly ( $\beta_{42} < 0$ ) and indirectly through a higher likelihood of postponing medical care ( $\beta_{32} < 0$  and  $\beta_{43} > 0$ ). The hypothesized pathways are predicted net of women's age, education level, gross family income, initial self-rated health, and remarried status. Because full-time employment at the time of divorce may provide a safety net for some women in the event of marital dissolution, we further compare the model in Figure 1 by employment status to determine whether and to what extent full-time employment moderates the pathway from divorce to subsequent illness.

### Methods

#### Data

We obtained the data for this study from the Iowa Midlife Transitions Project (MTP), a longitudinal (1991–2001) study of 539 rural families from an eight-county region in north central Iowa that closely mirrors the economic diversity of the rural Midwest (Lorenz et al. 2006). Originally designed to examine the effects of the farm crisis of the 1980s on rural families, the data set contains information on family demographics, work experiences, financial well-being, and a wide variety of other variables.

MTP families originally participated in either the Iowa Youth and Families Project (IYFP; Conger and Elder 1994) or the Iowa Single Parent Project (ISPP; Simons 1996). The IYFP began in 1989 as a study of married-parent families with at least two children per family, one of

whom was a seventh grader in 1989, and another a sibling within four years of age. The ISPP joined the study two years later, adding recently divorced mothers with at least two children, one of whom was a ninth grader in 1991, and another a sibling within four years of age. Researchers worked with public and private schools in the eight-county region to identify families meeting selection criteria. Of eligible married couples, 78 percent agreed to participate, as did 99 percent of single mothers (Conger and Elder 1994; Simons 1996).

The sample for this study includes 448 women who participated at least once in 1991, 1992, or 1994 and again in 2001, the final wave of the MTP (83 percent retention). Women who were originally from the IYFP sample (86 percent retention) were marginally more likely to stay in the study than the ISPP mothers (79 percent). As part of an attrition analysis, we estimate that those who dropped out of the panel were slightly younger (38.9 vs. 39.9 years of age;  $t = 2.03$ ), less well educated (12.7 vs. 13.5 years of school;  $t = 4.20$ ), and had significantly lower gross family income (\$26,631 vs. \$36,134;  $t = 2.76$ ) in 1991. We observed no other significant differences, including baseline self-reported health. If women who dropped out of our sample are slightly more disadvantaged than the population, on average (as in most studies), then our results will likely underestimate real disparities, and our analyses less likely to detect significant findings.

## Measures

Table 1 provides descriptive statistics for the variables used to measure constructs outlined in the conceptual model above, and examines differences in means by marital status in the first wave of the survey. Roughly one fifth of the women in the study had divorced between the beginning of 1989 and the end of 1990, and the other women were married. In multivariate analyses, "divorced (1991)" is coded to contrast women divorced at baseline (1) with married women (-1). To acknowledge that some of the divorced women remarried over the 10-year study period, the variable "remarried (1991–2001)" contrasts the divorced women who remarried (1) with divorced women who stayed single (-1) while coding the continuously married women with a zero (0). Of women who were divorced at baseline, 43 percent remarried over the 10-year study period.

We constructed the outcome variable, "physical illness (2001)," by summing respondent reports of symptoms and diseases. Respondents indicated (yes = 1, no = 0) whether during the past two years they had experienced one or more of 70 symptoms and physical illnesses, ranging



**Table 1. Descriptive Statistics for Married and Divorced Women.**

| Variable                  | Wave | Total<br>(N = 448 <sup>a</sup> ) |       | Married<br>(N = 361) |       | Divorced<br>(N = 87) |       | t      |
|---------------------------|------|----------------------------------|-------|----------------------|-------|----------------------|-------|--------|
|                           |      | Mean                             | SD    | Mean                 | SD    | Mean                 | SD    |        |
| Physical illness          | 2001 | 5.2                              | 4.0   | 4.9                  | 3.8   | 6.4                  | 4.8   | -3.0** |
| Adequate health insurance | 1992 | 69.6%                            | 46.0% | 73.3%                | 44.3% | 55.2%                | 50.0% | 3.3**  |
|                           | 1994 | 73.7%                            | 44.1% | 77.5%                | 41.8% | 57.7%                | 49.7% | 3.8*** |
| Postpone medical care     | 1991 | 37.2%                            | 48.4% | 34.2%                | 47.5% | 49.4%                | 50.3% | -2.6** |
|                           | 1992 | 40.0%                            | 49.0% | 37.3%                | 48.4% | 50.6%                | 50.3% | -2.3*  |
|                           | 1994 | 35.9%                            | 48.0% | 32.6%                | 46.9% | 50.6%                | 50.3% | -3.1** |
| Age                       | 1991 | 39.9                             | 4.0   | 40.1                 | 4.1   | 39.0                 | 3.7   | 2.3*   |
| Education                 | 1991 | 13.5                             | 1.7   | 13.6                 | 1.7   | 13.4                 | 1.7   | 0.9    |
| Family income (\$1,000s)  | 1991 | 36.1                             | 30.2  | 40.0                 | 31.0  | 20.1                 | 19.4  | 5.7*** |
| Self-rated health         | 1991 | 3.8                              | 0.9   | 3.8                  | 0.8   | 3.7                  | 0.9   | 1.2    |
| Full-time job             | 1991 | 56.7%                            | 49.6% | 53.2%                | 50.0% | 70.9%                | 45.7% | -3.0** |

<sup>a</sup> Missing data and pairwise deletion result in sample sizes ranging from 430 to 448.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

from relatively minor conditions such as the common cold and sore throats to more severe diseases such as heart conditions, diabetes, and cancer. Although we considered weighing illnesses according to severity, we finally decided to use simple counts because it is the conventional practice in the literature (e.g., Ferraro and Farmer 1996; Kubzansky, Martin, and Buka 2009; Liang et al. 1991; Lin and Ensel 1989) and is consistent with previous research using the data on which this study builds (Lorenz et al. 2006; Wickrama et al. 2006). Analyses not shown demonstrate that higher counts of illness correspond to the presence of more serious illnesses.

We chose counts of physical illness as an outcome instead of more global measures because it may be more objective than other survey measures of physical health status. Because respondents were asked to report on the presence or absence of each condition or illness on a list, in isolation from one another, the physical illness outcome may be less sensitive to variations in respondent psychological well-being than more subjective global measures such as self-rated health (Ferraro and Farmer 1996). Our relatively more objective measure of physical health, with its emphasis on identifiable illnesses, is also congruent with the goals of this study because it investigates whether divorce predicts poorer long-term health in part by imposing structural barriers on women's ability to address specific health issues when they arise. Women in the sample reported an average of 5.2 illnesses in the two-year period prior to the 2001 interview. The average number of illnesses divorced women reported (6.4) was significantly higher than that of married women (4.9).

The first of the two mediating variables, “adequate health insurance (1992;1994),” indicates whether a woman held health insurance she considered adequate to meet her medical needs in 1992 and 1994. (Health insurance information was not collected in the 1991 survey.) Because “the experiences of adults with inadequate coverage mirror those of their uninsured peers” both in barriers to obtaining health care and financial burdens (Schoen et al. 2005:289), the zero category includes both uninsured and underinsured women, where underinsurance is self-assessed (Blewett, Ward, and Beebe 2006). The inadequately insured group was split roughly equally between women without health insurance and women with coverage they deemed inadequate. Almost three quarters of the women in the sample (73.7 percent in 1994) reported having adequate health insurance coverage. However, as expected, the proportion of divorced women with adequate coverage was much lower, just over half of the sample in both 1992 and 1994.

The a priori decision to combine uninsured and underinsured was further supported by other characteristics of our sample. Analyses not included in tabular form indicate that the uninsured and underinsured were roughly equal in their rate of postponing health care in 1992 (68 percent and 62 percent, respectively; see below for definition) compared with those who were adequately insured (29 percent). Similar results were obtained for 1994 (73 percent and 65 percent compared with 24 percent). Examining the longitudinal consequences of inadequate health insurance, women who were uninsured and underinsured in 1994 reported similar numbers of illnesses in 2001 (6.0 and 6.6, respectively), significantly higher than their adequately insured counterparts (4.8).

“Postpone Medical Care (1991;1992;1994)” indicates whether women reported postponing medical and dental care for financial reasons in 1991, 1992, and 1994. In each wave of data collection, we presented women with a list of possible financial cutbacks and asked, “During the past twelve months, has your family made any of the following adjustments because of financial need?” We coded women who selected “postponed medical/dental care” as one (1) and others as zero (0). In each wave of data collection, between 35 and 40 percent of all women reported postponing medical or dental care for financial reasons, reflecting, perhaps, the economic difficulties faced by this rural sample following the farm crisis. Divorced women reported postponing care even more frequently, with about half indicating they had made this financial cutback in each wave.

The analyses control for four key covariates, each measured in the first wave of data collection. “Age (1991)” gives a woman’s age in years; “education (1991)” indicates years of school completed; “family

income (1991)" is gross family income, measured in \$1,000s; and "self-rated health (1991)" is a five-item global scale indicating self-perceived health (1 = poor; 2 = fair; 3 = good; 4 = very good; 5 = excellent). Self-rated health serves as the baseline health control for several reasons. First, the full checklist of illnesses was not administered in 1991. Second, consistent with our purpose, it has been proposed that "Self-rated health captures the full array of illnesses a person has and possibly even symptoms of disease as yet undiagnosed but present in preclinical or prodromal stages" (Idler and Benyamini 1997:27). Additionally, self-rated health is correlated with counts of illness both in our data (2001:  $-0.469$ ;  $p < .001$ ) and national data (Ferraro and Farmer 1999) and predicts medical care usage (Angel and Gronfein 1988; Gold, Franks, and Erickson 1996) and a range of subsequent health outcomes including physician assessments of health and mortality (Ferraro and Farmer 1999; Idler and Benyamini 1997).

In 1991, women averaged 39.9 years of age. Divorced women were, on average, slightly younger than married women. Sample respondents averaged 13.5 years of school; there was no significant difference by marital status. The average gross family income in 1991 was \$36,100. The average family income among the divorced women (\$20,100) was only about half the amount reported by married women, even though they were estimated to have incomes very similar to the married women before their divorce (Simons 1996). The initial self-rated health of married (3.8) and divorced (3.7) women did not differ significantly.

The proposed moderator of the conceptual model in Figure 1 is full-time employment in the first wave of data collection. "Full-time job (1991)" indicates whether women reported working in any one job for greater than or equal to 35 hours per week in 1991. We used the maximum number of hours in a single job rather than sum total weekly hours worked across multiple jobs because receipt of benefits often depends on full-time employment status. In 1991, just over half of the women in the sample were employed full time. This proportion was significantly greater among divorced women, of whom almost three quarters held full-time jobs.

### **Analytic Strategy**

The analyses that follow examine two potential mediators and a moderator of the relationship between divorce and later illness. First, we compare a sequence of structural equation models (SEMs) testing the conceptual model in Figure 1 (see Table 2). Then, we examine whether

**Table 2. Standardized Path Coefficients for Structural Equation Models Tracing a Pathway from Divorce to Physical Illness.**

|  | Model 1:<br>Baseline | Model 2:<br>Divorce -><br>Illness | Model 3:<br>+ Health<br>Insurance | Model 4:<br>+ Postpone<br>Medical Care |
|--|----------------------|-----------------------------------|-----------------------------------|--|
| <i>Measurement model</i>                   |                      |                                   |                                   |  |
| Adequate health insurance                  |                      |                                   |                                   |  |
| →Adequate health insurance (1992)          | 0.66—                | 0.66—                             | 0.67—                             | 0.70—                                  |
| →Adequate health insurance (1994)          | 0.76**               | 0.76**                            | 0.76***                           | 0.72***                                |
| Postpone medical care                      |                      |                                   |                                   |  |
| →Postpone medical care (1991)              | 0.71—                | 0.71—                             | 0.71—                             | 0.69—                                  |
| →Postpone medical care (1992)              | 0.77***              | 0.77***                           | 0.77***                           | 0.74***                                |
| →Postpone medical care (1994)              | 0.70***              | 0.70***                           | 0.70***                           | 0.74***                                |
| <i>Structural model</i>                    |                      |                                   |                                   |  |
| →Physical illness (2001)                   |                      |                                   |                                   |  |
| Postpone medical care                      |                      |                                   |                                   | 0.21*                                  |
| Adequate health insurance                  |                      |                                   | -0.17**                           | -0.04                                  |
| Divorced (1991)                            |                      | 0.12*                             | 0.09                              | 0.09                                   |
| Remarried (1991–2001)                      |                      | 0.01                              | 0.04                              | 0.02                                   |
| Age (1991)                                 | 0.03                 | 0.04                              | 0.03                              | 0.05                                   |
| Education (1991)                           | 0.08                 | 0.07                              | 0.09                              | 0.10*                                  |
| Family income (1991)                       | -0.08                | -0.05                             | -0.02                             | -0.01                                  |
| Self-rated health (1991)                   | -0.39***             | -0.39***                          | -0.36***                          | -0.36***                               |
| →Adequate health insurance                 |                      |                                   |                                   |  |
| Divorced (1991)                            |                      |                                   | -0.15*                            | -0.16**                                |
| Remarried (1991–2001)                      |                      |                                   | 0.15*                             | 0.12*                                  |
| Age (1991)                                 | -0.02                | -0.02                             | -0.02                             | -0.02                                  |
| Education (1991)                           | 0.11                 | 0.11                              | 0.10                              | 0.09                                   |
| Family income (1991)                       | 0.24**               | 0.24**                            | 0.20**                            | 0.20**                                 |
| Self-rated health (1991)                   | 0.15*                | 0.15*                             | 0.14*                             | 0.14*                                  |
| →Postpone medical care                     |                      |                                   |                                   |  |
| Adequate health insurance                  |                      |                                   |                                   | -0.61***                               |
| Age (1991)                                 | -0.06                | -0.06                             | -0.06                             | -0.06                                  |
| Education (1991)                           | -0.08                | -0.08                             | -0.08                             | -0.02                                  |
| Family income (1991)                       | -0.20**              | -0.20**                           | -0.20**                           | -0.06                                  |
| Self-rated health (1991)                   | -0.13*               | -0.13*                            | -0.13*                            | -0.04                                  |
| <i>N</i>                                   | 448                  | 448                               | 448                               | 448                                    |
| <i>R</i> <sup>2</sup> <sub>illness</sub>   | 0.17                 | 0.18                              | 0.20                              | 0.23                                   |
| <i>R</i> <sup>2</sup> <sub>insurance</sub> | 0.11                 | 0.11                              | 0.16                              | 0.15                                   |
| <i>R</i> <sup>2</sup> <sub>postpone</sub>  | 0.09                 | 0.09                              | 0.09                              | 0.41                                   |
| $\chi^2$                                   | 155.86               | 149.27                            | 123.97                            | 28.79                                  |
| df   | 34                   | 32                                | 29                                | 27                                     |
| CFT <sup>a</sup>                           | 0.84                 | 0.83                              | 0.87                              | 1.00                                   |
| RMSEA <sup>b</sup>                         | 0.09                 | 0.09                              | 0.09                              | 0.01                                   |

<sup>a</sup> Comparative fit index.

<sup>b</sup> Root mean square error of approximation.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

employment status moderates the pathways identified for the full group of women (Table 3).

Each of the models in Table 2 consists of both a measurement model and a structural model. The measurement portion (top of Table 2) uses

**Table 3. Proportion of Women with Adequate Health Insurance Across Time by Marital and Work Status at Baseline (1991).**

|          | Adequate Health Insurance (1992) |                    | Adequate Health Insurance (1994) |                    |
|----------|----------------------------------|--------------------|----------------------------------|--------------------|
|          | Not Employed Full-Time           | Employed Full-Time | Not Employed Full-Time           | Employed Full-Time |
| Divorced | 36.0%                            | 63.9% <sup>a</sup> | 32.0%                            | 69.5% <sup>a</sup> |
| Married  | 72.6% <sup>ab</sup>              | 75.1% <sup>b</sup> | 75.8% <sup>ab</sup>              | 80.2% <sup>b</sup> |

Superscripts identify statistically indistinguishable proportions ( $p < .10$ ).

multiple indicators of each latent variable to separate the variance common across the separate indicators from the variance unique to each separate indicator (thereby controlling for measurement error and yielding stronger overall measures), while the structural portion (bottom of Table 2) estimates the strength of relationships between the latent variables and all other variables in the model after controlling for measurement error (Bollen 1989).

In our models in Table 2, there are two latent variables, “adequate health insurance” and “postpone medical care.” The former has two observed indicators, measured in 1992 and 1994, while the latter has three observed indicators, measured in 1991, 1992, and 1994. The standardized path coefficients linking each observed indicator to its underlying latent variable are referred to as standardized factor loadings, similar to factor loadings in traditional factor analysis. As a rough guide, factor loadings greater than 0.50 are considered adequate and all our loadings are greater than 0.65. We tested measurement models using both categorical and continuous specifications of the adequate health insurance and postpone medical care indicator variables, and found that this specification did not substantively affect results. Accordingly, the fitted models reflect the continuous specification of the measurement model.

We estimated the models using maximum likelihood with bootstrap estimates of standard errors for direct and indirect effects (1,000 iterations) as recommended by Bollen and Stine (1990). Because 8 percent of the 448 sample members had missing data on some items, we obtained estimates using full-information maximum likelihood, which has been shown to have good performance in structural equation models (Enders and Bandalos 2001). All the models correlate the six exogenous variables—“divorced (1991),” “remarried (1991–2001),” “age (1991),” “education (1991),” “family income (1991),” “self-rated health (1991)” —and assume the residuals among endogenous variables—“adequate health insurance,” “postpone medical care,” “physical illness (2001)” —are uncorrelated.

## Results

### SEM and the Total Effect of Divorce on Subsequent Illness

Table 2 presents standardized path coefficients for the sequence of four structural equation models tracing the proposed pathway from divorce to number of illnesses a decade later. The table is arrayed so that the four models are presented in the four columns across the top. The factor loadings for the measurement portion of each model are reported in the first rows under measurement model. These factor loadings are from 0.66 to 0.77, all within the acceptable range of values (Bollen 1989). The structural model portion of Table 2 presents coefficients linking the three endogenous variables—"physical illness (2001)," "adequate health insurance," and "postpone medical care"—with predictor variables. The table first presents pathways to "physical illness (2001)," the key outcome variable. The table then presents in turn the first and second proposed mediators, "adequate health insurance" and "postpone medical care." The bottom of Table 2 reports the summary statistics for each model, including the estimated chi-square, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA).

Model 1 identifies three important associations between exogenous covariates and endogenous variables. First, women with higher incomes are more likely to have adequate health insurance (0.24) and less likely to postpone medical care for financial reasons (−0.20). Consistent with previous research, these findings indicate that individuals with lower incomes are more likely to be uninsured or underinsured than those with higher incomes, and are more likely to delay needed medical care (Schoen et al. 2008; Weissman et al. 1991). Second, women with better self-rated health in the initial survey wave are more likely to have adequate health insurance (0.15) and less likely to postpone medical care (−0.13) in intermediate waves. The causality of this association may work in both directions: women who tend to have better health insurance coverage and better access to medical care may come to have improved health, or women with poorer health may be denied adequate health insurance by not meeting eligibility requirements. This finding is consistent with previous research, which suggests that a higher proportion of individuals with health problems are uninsured or underinsured than healthier individuals (Schoen et al. 2008; Ziller et al. 2006). Third, better self-rated health in the initial survey wave (1991) is strongly predictive of lower numbers of illness ten years later (−0.39), thus providing evidence of continuity in health across the decade.

Adding to the baseline model, Model 2 estimates the total effect of divorce on counts of illness a decade later. Consistent with the

descriptive analyses in Table 1, the path coefficient of 0.12 indicates that divorced women have significantly higher levels of illness than married women 10 years after divorce occurs, even after controlling for remarriage, baseline health status, and other covariates.

### **Effect of Divorce on Illness via Adequacy of Health Insurance and Access to Care**

Model 3 adds two key pathways to Model 2: one from divorce to adequacy of health insurance ( $-0.15$ ) and another from adequacy of health insurance to counts of illness ( $-0.17$ ). Estimates suggest that women who divorced between 1989 and 1990 were significantly less likely to hold adequate health insurance in the years following the divorce (1992;1994), and that women holding inadequate health insurance report more illnesses in 2001.

Adding this indirect effect to the model reduces the magnitude of the effect from divorce to illness from a significant 0.12 to a nonsignificant 0.09, suggesting that adequacy of health insurance partially mediates the relationship between divorce and later illness. Note that Model 3 also adds a third pathway, showing that remarriage is also significantly predictive of adequate health insurance (0.15). This perhaps suggests that those who remarried may have entered divorce with more resources, one of which may have been health insurance. Alternatively, some women who remarried may have recovered health insurance by gaining access to the fringe benefits of their new spouses.

Model 4 represents the model in Figure 1 and further elaborates the relationship between adequacy of health insurance and subsequent health by estimating the mediating effects of postponing medical care. Women who report having inadequate health insurance are much more likely to postpone medical care for financial reasons ( $-0.61$ ), and those who postpone medical care report more illnesses in 2001 (0.21). Adding this indirect effect to the model reduces the direct effect of adequacy of health insurance on counts of illness from  $-0.17$  to  $-0.04$ , indicating that postponement of medical care mediates the relationship between adequacy of health insurance and illness. The key mechanism linking adequacy of health insurance and later illness may thus be access to needed health care. Model 4 also contains one unintuitive result: women with higher levels of education report higher counts of illnesses in 2001, even after controlling for other factors. Although this could be a methodological artifact of multiple regression, we also speculate that better educated individuals may be more familiar with a wider range of illnesses, and more vigilant in observing and reporting illnesses in the self-report checklist.

Because the four models in Table 2 are nested, differences in the chi-square goodness-of-fit tests can be used to compare the improvement in fit of one model over the next. Accordingly, Model 3 fits significantly better than Model 2 ( $\Delta\chi^2 = 25.30$ ;  $\Delta df = 3$ ;  $p < .001$ ), but our hypothesized Model 4 is the strongest model, fitting clearly better than Model 3 ( $\Delta\chi^2 = 95.18$ ;  $\Delta df = 2$ ;  $p < .001$ ).

### **Employment as a Buffer against Insurance Loss after Divorce**

Do divorced women in rural areas working full time experience the same pathway to higher rates of illness as their unemployed and part-time-working counterparts? To answer this question, we first examine descriptive statistics on how employment status relates to health insurance coverage. Table 3 presents proportions of women in 1992 and 1994 who report adequate health insurance coverage, by their marital status and employment status in 1991. The women most likely to report being uninsured or underinsured are divorced women who were not working full time at or shortly after their divorce. Only about one third of this group reported adequate insurance coverage. Among women employed full time, divorced women were again less likely to hold adequate insurance coverage compared to married women, but by a much smaller margin, suggesting a partial protective effect of full-time employment on health insurance coverage. Women both married and employed full time reported the highest rates of adequate insurance coverage (about three quarters were insured), although these rates were not statistically higher than those reported by other married women.

We confirmed the protective effect of full-time employment status on divorced women's health insurance coverage by conducting a multiple group analysis of Model 4 that compared women employed full time at baseline with those who were not (see Bollen 1989). Although the analyses are based on unstandardized data, we report the standardized coefficients for ease of interpretation. Focusing specifically on the pathway from divorce to adequacy of health insurance, the path coefficient is a significant  $-0.27$  for women not employed full time in 1991, whereas the corresponding coefficient for women employed full time in 1991 is not statistically significant and estimated at  $-0.13$ . When we constrain the two paths to be equal, the increase in chi-square is significant ( $\Delta\chi^2 = 4.1$ ,  $\Delta df = 1$ ,  $p < .05$ ). This comparison suggests that full-time employment has a protective effect on divorced women's health insurance status. As a consequence, divorced women employed full time at or soon after divorce may be less likely to postpone necessary medical care and, on average, report better physical health outcomes than other divorced



women. This is consistent with descriptive statistics (not shown in tabular form) that show that divorced women working full time in 1991 report an average of 5.9 illnesses in 2001, compared with the 7.5 illnesses reported by divorced women not working full time.

### **Discussion**

Previous studies suggest that material resources, broadly speaking, are associated with health differentials between married and divorced women. Extending this line of research, this article specifically identifies health insurance coverage as an important policy-relevant resource connecting divorce with poorer long-term health outcomes in a sample of rural women. Expanding on research from multiple disciplines, this study is the first to link the pathways from divorce to illness via lower rates of health insurance coverage—in any sample—and to examine the causal model as a whole within an SEM framework using a longitudinal data set. Although SEM analyses cannot prove a causal relationship, associations observed in the data are consistent with a causal explanation of divorce's effect on health insurance and increased illness. We trace the effects of divorced women's poorer health insurance coverage longitudinally, seeing that the absence or inadequacy of this important financial resource inhibits access to medical care, in turn eroding physical health. Our analyses indicate that divorced women are less likely to have adequate health insurance, decreasing their likelihood of making needed medical and dental visits. Divorced women's lack of adequate health insurance proves to have a detrimental association with long-term health.

The findings lend support to the resource model in explaining health differentials between married and divorced individuals. Health insurance coverage, often jeopardized in the event of divorce, is important as both a financial and a health resource. The importance of health insurance in the resource model is also consistent with recent research showing that the gap in physical health between married and previously married individuals has been increasing over the past 30 years (Liu and Umberson 2008).

Neither the resource model nor its close competitor, the crisis model, however, adequately explains the growing health differential nationally or in rural areas. From the crisis perspective, divorce rates have increased dramatically over this period, causing this life-course transition to become "more normative and less stigmatized" (Liu and Umberson 2008:240). Thus the accompanying stress and associated health problems would be expected to decline over time rather than increase.

However, the material resources model is not wholly adequate either. Because women's labor force participation has dramatically increased over this period, it is unlikely the material hardship of divorced individuals has grown over recent decades. Rather, Smock (1993) shows that the costs of material disruption appear to be stable over time.

Findings from our study shed light on a possible explanation for the declining health of divorced individuals relative to that of married individuals over the past 30 years. During this time, there has been a rapid increase in health care costs relative to most other categories of household expenditures, which suggests that risks posed by being uninsured or underinsured may have increased, disproportionately affecting divorced individuals (Altman and Levitt 2002). Future research should probe this possibility.

This study also provides support for the notion that full-time employment may act as a health insurance safety net in times of marital instability. Full-time employment appears to protect health insurance coverage after divorce. Divorced women who do not work full time are least likely to be adequately insured, while divorced women working full time hold adequate health insurance at a much higher rate. This finding aligns with previous research that indicates that the decline in women's broader economic well-being following marital dissolution is much less acute for women employed full time (Bianchi, Subaiya, and Kahn 1999).

### **Geography, Generalizability, and Future Replications**

A recent review of linkages between families and health noted that the strongest emerging work in this area moves beyond the question, "Does family structure affect health?" and addresses instead, "Under what conditions, for which outcomes, for whom, and through which pathways does family structure, context and process affect health?" (Carr and Springer 2010:743). This study begins to meet this challenge, and advances the literature to examine the mechanisms through which divorce affects health in a rural Iowan sample.

A fruitful direction for future research will be to assess heterogeneity in the marital disruption–health relationship and in potential intermediary mechanisms. The relatively small and geographically homogenous sample limited our capacity to do so in this study, beyond considering women's employment status as a potential buffer against insurance loss. Recent studies have looked at how changes in health after marital disruption differ by women's age and birth cohort (Liu 2012) and by marital quality (Hawkins and Booth 2005; Williams and Umberson 2004), but none to our knowledge examine differences by social context.

Certainly, the health advantages of marriage have been documented across a variety of populations and contexts, including samples in North America, Europe, and Asia (Hughes and Waite 2009; Manzoli et al. 2007) and for whites, African Americans, and Hispanics in the United States (Schoenborn 2004). Nevertheless, differences in the marital disruption–health relationship by social context seem likely in light of the large and growing body of evidence that the characteristics of places in which people live and work are important determinants of health status (Diez Roux and Mair 2010; Taylor, Repetti, and Seeman 1997). For example, women who live in places and times with a large stock of high-quality affordable housing, a tight labor market, strong community social ties, outdoor spaces for recreation, and an adequate supply of mental and physical health care services might experience minimal health declines after divorce compared to their counterparts in less healthy environments. Learning more about such specific contextual modifiers would further our understanding of the intermediary mechanisms that link marital disruption and health.

Also worth considering is how the more aggregate geographic context—rural and urban residence—affects the marital disruption–health relationship. Future studies should replicate the model in Figure 1 using urban or nationally representative data sets to determine whether the mechanisms identified in this study are operational in other geographic contexts. One hypothesis is that marital disruption might have a larger impact on rural women's health and use of health care because rural populations have lower rates of health insurance coverage, poorer access to medical care, and poorer overall health than urban populations (Ziller et al. 2003). Additionally, divorced women in rural areas are perhaps even more disadvantaged than their urban counterparts, as evidenced by their poorer job prospects and higher rates of poverty (Brown and Lichter 2004). On the other hand, because family patterns of marriage and divorce in rural areas have largely converged with urban family patterns, the mechanisms identified in this study may reflect those in the U.S. population as a whole (Lichter and Brown 2011; MacTavish and Salamon 2004). This hypothesis also seems plausible when we consider that the disparity in rates of insurance coverage by marital status is even more pronounced in urban areas, where the risk of being uninsured is twice as high for single individuals as for married ones (Hummer et al. 2004).

Replications should try, where possible, to refine measures of insurance coverage and to distinguish gradients of uninsurance and underinsurance. One advantage of the MTP data is that they allow us to consider the adequacy of a woman's insurance coverage, rather than to

look strictly at the presence or absence of insurance coverage. Still, there is room for improvement. Lower-quality health insurance plans often have high deductibles, high copays, and low payout limits.<sup>1</sup> In 2007, nearly two thirds of personal bankruptcies in the United States resulted from the high cost of medical problems; surprisingly, *three quarters* of those medical debtors had health insurance at the onset of their illness or condition (Himmelstein et al. 2007). This striking figure demonstrates the lack of protection afforded by poor-quality insurance coverage. Studies that examine the effects of “any insurance coverage” will likely underestimate the detrimental effects of divorce on illness as mediated by health insurance coverage. Divorced women able to avoid insurance loss by switching to a new plan (e.g., through their own employer, the private market, or a public insurance program) may experience a decline in quality of health insurance coverage, a decline that would be missed entirely if only uninsurance status were tabulated.

Replications should also examine the robustness of study results in alternative measures of health outcomes. This study focuses on counts of physical illness because it tests a model of structural detriments to post-divorce health (lack of adequate health insurance, limited access to medical care). We speculate that relatively more subjective health outcomes such as global measures of self-rated health may prove to have weaker ties with structural detriments of health following divorce (but perhaps stronger ties with social-psychological detriments), and thus replications using these measures may fail to detect any contribution of health insurance and access to health care to divorced women’s poorer health. Future research may also examine whether the structural pathways found here are replicated using measures of mortality, functional limitations, and comprehensive indices of health that combine multiple dimensions (see, e.g., Boardman 2004). Advancing our understanding of the pathways linking marital disruption and each of these health outcomes is an important next step in this literature, which has laid the groundwork by documenting the basic marital health advantage across a wide range of health outcomes (Hahn 1993; Hughes and Waite 2009; Johnson et al. 2000; Liu 2012; Liu and Umberson 2008; Lorenz et al. 2006; Manzoli et al. 2007; Schoenborn 2004).

### **Policy Implications**

Considering the high instability of U.S. family structures, this study exposes the consequences of a major fault in the current health

<sup>1</sup> Lifetime and annual payout limits are outlawed under the Affordable Care Act, with full implementation in 2014.

insurance system. The U.S. health care system currently offers little protection against insurance loss for individuals who divorce. One federal law—the Consolidated Omnibus Budget Reconciliation Act of 1985, commonly referred to as COBRA—grants most newly divorced individuals the right to retain dependent coverage through their ex-spouses' employers for up to 36 months after divorce (U.S. Department of Labor 2012). Electing COBRA continuation coverage, however, is often prohibitively expensive, limiting its effectiveness. In 2011, standard COBRA premiums averaged nearly \$500 per month for individual coverage (Claxton et al. 2011).

However, there is one uplifting aspect of this troubling story. Unlike many other factors contributing to the poorer health of divorced women—the stress of marital conflict and the divorce process and the loss of social support and shared economic resources—the decline in access to quality health insurance is one that is more directly policy amenable. Given the far greater instability in both family life and employment than in decades past, one might question the wisdom of continuing to tie health insurance coverage to marital and employment roles (Montez, Angel, and Angel 2009).

Certainly, the best way in which to provision health insurance coverage has been a point of significant debate in national politics in recent years. The Affordable Care Act passed in March 2010 under the Obama administration has the potential to mitigate the risk of insurance loss following divorce, thereby helping to protect the health of divorced women in rural communities and elsewhere. The law has provisions expected to expand the availability of insurance to women through their own jobs, to make insurance more affordable for women on the private market, and to expand eligibility for Medicaid and other need-based public insurance programs. However, the major provisions of this new law are not scheduled to go into effect until 2014, so for several years data will remain unavailable to examine empirically how the health insurance reforms contained therein will change the health insurance and health prospects of marital separators.

Regardless of how health insurance and health care reforms unfold over the coming years (and even decades), policymakers should be aware that a system that induces a de facto linkage between marital status and insurance coverage may have unintentional and deleterious consequences.

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