The Effects of Marriage on Health: A Synthesis of Recent Research Evidence

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CHAPTER I

INTRODUCTION

Marriage has become an increasingly important topic in academic and policy research. A burgeoning literature suggests that marriage has a wide range of benefits, including improvements in individuals' economic well-being and mental and physical health, as well as the well-being of their children (Lerman 2002; Ross et al. 1990; Waite and Gallagher 2000; Wilson and Oswald 2005). Inspired, in part, by these potential benefits of marriage, several large-scale federal initiatives have been launched in recent years that aim to encourage and support marriage.

This synthesis focuses on recent research evidence concerning one of these potential benefits of marriage—the effects of marriage on health. In general, married people are healthier than those who are not married across a wide array of health outcomes (Schoenborn 2004). The existence of an association between marriage and health does not necessarily imply that marriage causes better outcomes, however. In particular, people who marry may already be healthier than those who do not, and this may be the reason for the better health of married adults. An examination of the relevance of these patterns for public policy must include careful consideration of whether the association between marital status and various health measures indicates that getting and staying married actually improves health.

To provide a broad understanding of the current research on the link between marriage and health, we have synthesized recent literature across several fields, including public health, the social sciences, and medical science. We focus on research published in peer-reviewed journals and on studies using the most rigorous methods for determining whether the link between marriage and health is a causal one. A review of all the research that examines marriage and health is beyond the scope of this project. Therefore, we have narrowed our review to examine the research of most relevance to the U.S. policy community. In particular, we focus on research conducted with U.S. populations and completed since 1990. In addition, we focus on research that uses the most sophisticated statistical methods for determining whether marriage does indeed improve health outcomes. By focusing on the most compelling research evidence concerning the effects of marriage on health, we aim to provide an accurate portrayal of the current state of research—documenting what we do and do not know about the linkages between marriage and health.

In the rest of this chapter, we lay out the theoretical and practical structure of this review. First, we discuss how marriage may both affect, and be affected by, health outcomes and describe how we focus this synthesis on studies that carefully address this complex relationship. Next, we explain the parameters for our review, including the particular health outcomes we consider and the types of studies we review. Finally, we preview the findings summarized in the following chapters, which discuss the most recent evidence of the effect of marriage on health outcomes.

UNDERSTANDING THE MARRIAGE-HEALTH CONNECTION

Although the association between marriage and health is well established, the fact that married people generally have better health does not necessarily imply that marriage causes these better health outcomes. Instead, healthier people may be more likely than those who are less healthy to get and stay married, because they may be considered more desirable marriage partners in terms of their various attributes (such as physical attractiveness, earnings potential, mental well-being, degree of self-sufficiency, and likely longevity). Social scientists describe this pattern of married people being more likely to marry as the "selection" of healthy people into marriage. If the only reason for the correlation between marriage and health is the selection of healthier people into marriage, then marriage is not causing better health. Instead, the observed health differences between married and unmarried people are the result of healthier people being more likely to marry.

Alternatively, marriage may have real health benefits, and the association between marriage and health outcomes may represent a true causal link. This view is sometimes known as "protection theory," because marriage is seen as protecting people against poor health outcomes. Marriage could improve health outcomes in a variety of ways. Marriage potentially offers both economic and social advantages. In particular, marriage may result in two incomes, as well as economies of scale, improving the economic well-being of those who marry (Lerman 2002). This increased economic well-being could, in turn, improve health outcomes by increasing access to health care or lowering stress. In addition, a spouse may play an important role in monitoring and encouraging healthy behaviors (such as good eating habits and regular exercise), as well as in discouraging unhealthy ones (such as smoking or heavy drinking) (Umberson 1987). Marriage also may provide an emotionally fulfilling, intimate relationship, satisfying the need for social connection, which could have implications for both physical and mental health (House et al. 1988). Finally, some speculate that society stigmatizes single people (DePaulo and Morris 2005). If this is true, entry into marriage represents adhering to cultural norms and, thus, yields mental health benefits through social acceptance. Most researchers conclude that the association between marriage and health represents a combination of selection and protection (Lillard and Panis 1996; Murray 2000; Waite 1995). In other words, marital status both affects, and is affected by, health outcomes.

Because marriage is likely to be both a cause and a consequence of these health outcomes, a central challenge of studying the relationship between marriage and health is disentangling the influences of selection and protection and isolating the true causal influence of marriage on health. Addressing these issues requires careful analysis and

advanced statistical methods that are not always used in studies examining the link between marriage and health. In reviewing the literature in this area, we have paid particular attention to the care with which studies have addressed selection. Our review highlights the research that has most thoroughly addressed the role of selection in the association between marriage and health and, thus, focuses on studies that provide the most compelling evidence on whether marriage has a true causal influence on health outcomes.

SCOPE OF THE SYNTHESIS

A large body of literature addresses the link between marriage and health, and a review of all this research is beyond the scope of this synthesis. Therefore, to focus our review and make it both manageable and as relevant as possible, we have developed parameters to guide our identification of the research to review. In particular, we have selected health measures from a broad range of outcome areas that are important indicators of well-being and have been the subject of numerous studies. In addition, we have focused on the most up-to-date, rigorous studies, to provide a summary of the current state of knowledge. In this section, we describe the health outcomes we examine and the kinds of studies we review.

Health Outcomes

Health is a multidimensional concept that encompasses a large array of measures, including behavioral, physical, and emotional outcomes. We have selected health outcomes from five broad topic areas and focused our review on those outcomes likely to be of most interest to the health policy community. In particular, we focus our synthesis on the following outcomes:

- ***Health Behaviors.*** One important way that marriage may affect overall health is by increasing the likelihood that people will engage in healthy behaviors (such as exercise and eating a balanced diet), while also reducing various risk-taking behaviors (such as smoking or drinking heavily). For this review, we focus on health behaviors that have well-documented connections with physical health outcomes. In particular, we examine the evidence on the effect of marriage on alcohol and drug use, smoking, body weight, and exercise.

- ***Health Care Access and Use.*** Marriage may also affect health by influencing health care access and patterns of health care use. For example, marriage might improve access to care by increasing the material resources available to purchase care or by affording access to a spouse's health insurance policy. To the extent that marriage improves access to care or influences patterns of health care use, it might also have consequences for health care costs. To summarize research in this area, we focus on the links between marriage and three main health care outcomes: (1) health insurance status; (2) health care use (for example, use of cancer screenings and hospital care); and (3) total health care costs.

- ***Mental Health.*** Marriage may also affect physical health through its influence on mental health. A vast literature links mental health to marital status and marital quality. To remain within the resource constraints for this review, we focus on one specific measure of mental health: the presence of depressive symptoms. Depression is one of the most common forms of psychological distress and can be highly debilitating. It is also highly correlated with physical health. For these reasons, it is a logical outcome to examine as part of our research synthesis.

- ***Physical Health and Longevity.*** The ultimate concern of this review is whether marriage affects physical health and longevity. Rigorous research on the effects of marriage on particular physical health outcomes is limited. In our synthesis, we describe the evidence from several of the strongest recent studies in this area. Most commonly these studies examine self-rated measures of general health status. However, we also summarize one study of the effects of marriage on cardiovascular disease. Studies of marriage and longevity typically examine the effect of marital status on mortality risk over a specific time period. Unlike the effects of specific physical health outcomes, the effect of marriage on longevity has been studied extensively.

- ***Intergenerational Health Effects.*** A couple's marital status might also have long-term consequences for the health of their children. For this review, we focus on a growing body of research linking parental marital status in childhood with health outcomes experienced much later in adulthood. Studies in this area also link parental marital status with adult longevity. These studies represent an emerging area of interest on the lingering effects of early childhood experiences.

Search Parameters and Methods

A voluminous research literature discusses the link between marriage and these health outcomes. A full review of all the relevant research concerning the possible effects of marriage on these outcomes is beyond the scope of our current effort. Therefore, to further target the review, we have used the following additional parameters:

- ***Studies Published Since 1990.*** To ensure that we focus on the most relevant and up-to-date research, we concentrate on studies published since 1990. Because the institution of marriage itself has evolved, its health consequences may have also changed. A policy-relevant research synthesis requires a focus on the most recent research evidence.

- ***Studies Published in Peer-Reviewed Journals.*** To ensure that the review focuses on the highest-quality research, we focus the synthesis on studies published in peer-reviewed journals.

- ***Studies of U.S. Populations.*** Marriage and its health consequences may vary across different countries and cultures. Therefore, we focus on studies that have been conducted with U.S. populations, because they are of most relevance to the U.S. policy community.

- ***Studies That Carefully Address Selection and Causality.*** Many studies examine the correlation between marriage and health but do not carefully consider whether this correlation represents a true causal link. In this synthesis, we highlight studies that have considered this issue carefully and addressed it through detailed controls for background characteristics and the use of other statistical techniques.

- ***Studies That Focus on the Link Between Marriage and Health Outcomes.*** Many studies of health outcomes use marital status as one of many covariates and do not focus particularly on the link between marriage and health. We selected studies that had a particular focus on the marriage-health connection, because these studies are more likely to have addressed issues of selection and causation more carefully. [1]

To identify relevant articles, we used several research-oriented search engines. First, we used EBSCOhost, which indexes more than 3,600 peer-reviewed publications, including research in such fields as economics and sociology. To supplement EBSCOhost, we also searched for articles using MEDLINE® and PsycInfo®. MEDLINE uses the National Library of Medicine's online database, and contains information on medical and health sciences. PsycInfo is a database of more than 2,000 peer-reviewed journals that covers the behavioral sciences and mental health. Through these three databases, we were able to search for literature in many disciplines, such as medicine and epidemiology, as well as psychology and other social sciences.

The search terms we used corresponded to the parameters described above. Specifically, we restricted the search to literature published in 1990 or later and only included peer-reviewed sources. To identify relevant articles, we used particular search terms, such as "marital," "marriage," and "family structure" and paired these with each of the health outcomes of interest, such as "mortality" or "depression."

[1] This review does not examine the effect of cohabitation on health or the differing health effects of marriage and cohabitation. In the large majority of studies we examined, cohabitation was treated as equivalent to being single. Therefore, in most cases, when these studies compare the health outcomes of those who are married to the health outcomes of those who are not, cohabiters are included in the "not married" group. In a few studies, cohabitation was treated as a separate status, distinct both from being married and being single. None of the studies included in our review treated cohabitation as equivalent to marriage.

OVERVIEW OF THE SYNTHESIS

In the rest of this report, we discuss the recent research on marriage and selected health outcomes. In each chapter, we discuss what is currently known about the potential effects of marriage on each set of health outcomes, highlighting the research with the strongest methodologies. We note any relevant gender or racial differences, discuss possible discrepant findings, and, when appropriate, offer explanations for why the discrepancies may have occurred.

We begin with a review of the research evidence concerning the effects of marriage on health-related behaviors. In Chapter II, we focus on the effects of marriage on four sets of health behavior outcomes: (1) drinking and marijuana use, (2) smoking, (3) bodyweight, and (4) exercise. We focus our review on studies that use longitudinal data and relate changes in marital status to changes in various health behaviors, because these analyses provide more compelling evidence of a causal link between marriage and these behaviors. We find that there is substantial research evidence suggesting that, for young adults, marriage reduces heavy alcohol consumption for both men and women, as well as substantial evidence for young men of a reduction in marijuana use associated with marriage. There is also strong evidence suggesting that both men and women experience modest weight gain during marriage. The evidence on marriage's effect on physical activity is more limited, but it suggests that marriage leads to reductions in exercise, particularly for men. There is no consistent evidence of an effect of marriage on smoking.

In Chapter III, we examine the links between marriage and health care access and use. We consider three main health care outcomes: (1) health insurance status, (2) health care use, and (3) health care costs. The best studies in this area relate transitions in marital status to subsequent changes in either access to care or patterns of health care use. Studies show that transitions out of marriage often lead to loss of health insurance coverage—particularly for women—as people lose access to a spouse's health insurance plan. Studies of the effect of marriage on health care use and cost suggest that marriage may reduce health care costs through its effects on the number of doctor visits, the length of hospital stays, and the likelihood of nursing home admissions. Researchers conclude that married people—particularly married men—may spend less time in the hospital and in nursing homes because their spouses can provide informal care for them at home.

In Chapter IV, we examine the effect of marriage on mental health, focusing on depressive symptoms. The link between depressive symptoms and marital status is especially well studied, with research covering many decades. Recent work consistently indicates that—for both men and women—marital entry decreases depressive symptoms while marital dissolution increases them. Similarly, those who are stably married report fewer depressive symptoms than do similar adults who are stably unmarried—even after controlling for baseline health—which also suggests that marriage reduces the prevalence of depressive symptoms.

In Chapter V, we examine the effect of marriage on physical health and longevity. In general, however, this research has used estimation techniques that do not fully address the

potential selection of healthier people into marriage. Therefore, the current research offers limited evidence on the effects of marriage on general physical health or specific physical health outcomes. Limited evidence suggests that transitions into and out of marriage are related to changes in men's self-rated health and that divorce has a significant negative effect on women's physical health; however, these findings are based on a limited range of physical health indicators and do not adequately assess the possible long-term effects of marriage on general physical health status. We also examine the effects of marriage on longevity. The pattern that married people live longer has been found for more than 100 years and across many countries. Isolating and controlling for the effect of selection is a challenge, however, and many studies are unable to address it adequately. Unlike the other health outcomes we examine in our review, the strongest evidence of an effect of marriage on longevity comes more from the robustness of the relationship across a wide range of studies than from the particular results of any single study.

In Chapter VI, we switch our focus from the health effects of marriage on those who are married to examine the possible intergenerational health effects of marriage. In particular, we review the evidence on the possible long-term consequences of marriage for the physical health outcomes of a couple's children. Due, in part, to the relatively limited availability of data linking parental marital status in childhood with adult physical health outcomes, the research in this area is generally more speculative and based on less rigorous statistical methods than most of the other evidence featured in this review. The studies that are available, however, suggest that growing up with two parents does improve long-term physical health outcomes, particularly for men.

In Chapter VII, the concluding chapter, we summarize the findings presented in Chapters II through VI to provide a cogent description of the current state of research. We also discuss the gaps and limitations in the research literature, as well as logical next steps for future research. By laying out the strengths and weaknesses of existing work, we aim to provide a document that accurately and clearly portrays the current state of knowledge on the linkages between marriage and health.

CHAPTER II

THE EFFECTS OF MARRIAGE ON HEALTH BEHAVIORS

One important way in which marriage may influence a person's health is through its effect on health-related behaviors, such as alcohol consumption, drug use, cigarette smoking, diet, and exercise. Marriage may affect these kinds of behaviors in a variety of ways, and the expected direction of these effects is not always clear. For example, new responsibilities and social norms associated with marriage may encourage people to give up certain behaviors considered incompatible with married life, such as heavy drinking or drug use. In addition, marriage may have a substantial influence on how adults spend their time—reducing the amount of time spent socializing with friends, for example. These changes may lead to a reduction in alcohol consumption, if marriage causes people to be less likely to go out to social events that involve drinking. If the responsibilities of family life reduce the time available for exercise, these changes may also lead to a reduction in the amount of physical activity. Having a spouse to monitor one's behavior may encourage healthier living habits—such as a better diet, less heavy drinking, and more physical activity. On the other hand, married adults may be less concerned than single adults with physical attractiveness, making them less worried about their weight and the amount of exercise they get.

In this chapter, we review the recent research evidence concerning the effect of marriage on these health behaviors. The best studies in this area use longitudinal data and examine how transitions into and out of marriage affect these behaviors. Studies of this type provide the most compelling evidence of a causal relationship between marriage and health behaviors because sample members in effect serve as their own control group (since these behaviors are observed both before and after marriage). By focusing on how changes in marital status relate to changes in health behaviors, these studies adjust for background differences that do not change. The strongest studies of this type examine whether the changes in health behaviors occur near the time of the marital transition, because this provides more compelling evidence of a causal link between the change in marital status and the changes in these behaviors. For this reason, we focus our review on studies that use longitudinal data and can link the timing of marital transitions closely to the timing of changes in behavior. Studies relying on this methodology require large sample sizes so that they will have enough sample members who change marital status during the follow-up

period to estimate these effects precisely. Therefore, we restrict our review to studies using large data sets with substantial numbers of sample members who experience marital transitions. In addition, we restrict our review to studies completed since 1990 and that involve U.S. populations.

We begin by reviewing the research evidence concerning the link between marriage and alcohol consumption and drug use. We then review the research evidence concerning the potential effect of marriage on smoking. Next, we discuss the research concerning marriage and body weight. We end the chapter with a review of the evidence on marriage's effect on physical activity.

EFFECTS OF MARRIAGE ON ALCOHOL AND DRUG USE

Much of the recent research concerning the connection between marriage and health behaviors has examined the effect of marriage on alcohol use. These studies have examined the effects of transitions both into and out of marriage on alcohol consumption, and the effects of marriage on both the likelihood of heavy drinking and on the overall level of alcohol consumption. Most research in this area has focused on younger adults and the effect of entry into first marriage on their alcohol use. Less research has been done on the effects of marriage on the alcohol consumption of older Americans, and studies that have been completed on older populations are based on nonrepresentative samples. A few recent studies have also examined the effects of marriage on marijuana use. These studies have focused exclusively on these effects among younger adults, in part because drug use is more common among younger adults.

Effects Among Younger Americans

One of the most rigorous recent studies of the effects of marriage on the substance use of younger Americans was conducted by Duncan et al. (2006) and uses data from a large, nationally representative sample drawn from the National Longitudinal Survey of Youth (NLSY). This study examines the effect of transitions into first marriage on marijuana use and binge drinking (defined by these researchers as having had six or more drinks in one day) during the past month. Data for this study were collected from 1979 through 2000, when most sample members were in their 20s or 30s. Their statistical models examine the change in the likelihood of binge drinking and marijuana use during the 24-month period from one year before first marriage to one year after it. Their models are estimated separately for men and women and control for age, race, education, calendar year, and the presence of children under age 10 in the household.

Duncan and his colleagues find that, for both men and women, the frequency of binge drinking declines substantially during this 24-month window just before and just after first marriage. For men, their estimates suggest a drop in the likelihood of engaging in binge drinking around the time of marriage from 50 to 45 percent. For women, their results suggest a drop from 27 to 22 percent. This lower rate of binge drinking relative to what would have been expected if these young adults had not married persists for both men and women beyond the first year of marriage. However, the likelihood of binge drinking does

not continue to decline with more years of marriage. Duncan and his colleagues find that these declines in binge drinking around the time of first marriage are similar for African Americans and whites, as well as for those with higher and lower levels of education.

The Duncan et al. study also finds significant reductions in marijuana use associated with entry into first marriage for men. These researchers estimate that, among men, entry into first marriage is associated with a drop in the likelihood of having used marijuana in the past month from 19 to 12 percent. However, the study finds no significant effect of marriage on the marijuana use of young women (who, in general, have substantially lower rates of marijuana use than do young men). As with the effects on binge drinking, the Duncan et al. study finds that these patterns are similar for African Americans and whites.

Several earlier studies also used NLSY data to examine the connection between marriage and alcohol consumption and found results similar to those from the Duncan et al. study. For example, Curran and his colleagues (1998) use these data to examine how the transition into first marriage affects the average weekly consumption of alcoholic beverages, which they define as the number of beers, glasses of wine, or drinks of liquor consumed in the seven days prior to the survey. The Curran et al. study restricts the sample to those who were at least 21 years old in 1982, roughly the oldest half of the NLSY cohort. They use data from the 1982 to 1985 waves of the NLSY, when this cohort was in their mid-20s.

As in the Duncan et al. study, Curran and his colleagues use a statistical methodology that allows them to closely link the timing of declines in alcohol consumption with the timing of marital transitions, permitting them to test the causal nature of the relationship between marriage and alcohol consumption more carefully. Using a latent growth curve analysis, these researchers find that total alcohol consumption declines more rapidly around the time of first marriage than it does for similar individuals who do not marry and that this effect is similar for men and women. In an earlier study using NLSY data from the mid-1980s, Miller-Tutzauer and her colleagues (1991) use similar analytic methods and also find that the transition into first marriage is associated with a significant decline in alcohol consumption for both men and women.

As in the Duncan et al. study, Curran and his colleagues test whether the effect of entry into first marriage on alcohol consumption is different for African Americans and whites. However, unlike the Duncan et al. study, which finds similar marriage effects for African Americans and whites, Curran and his colleagues find that, although the entry into a first marriage is associated with a significant decline in alcohol consumption for both African Americans and whites, this decline is significantly smaller for African Americans.

There are several possible reasons for the difference in these results across the two studies. First, the two studies use different measures of alcohol consumption. The Curran et al. study examines average weekly consumption, whereas the Duncan et al. study examines frequency of binge drinking. Marriage may have a similar effect for African Americans and whites on the likelihood of binge drinking but different effects on their average level of alcohol consumption. Second, the Duncan et al. study uses a longer follow-up period than does the Curran et al. study, allowing these researchers to examine the effects of first

marriage on alcohol consumption for people who marry for the first time as late as their mid-30s, while the Curran et al. study examines only those who married by their mid-20s. Including a wider age range for first marriage may make the results for African Americans and whites more similar. In spite of these differing results concerning whether the marriage effect on alcohol consumption is the same for African Americans and whites, both studies consistently find that entry into first marriage is associated with a reduction in alcohol consumption for both African Americans and whites, as well as for both men and women.

Bachman and his colleagues (1997) use a different nationally representative data set to examine the link between marriage and substance use among young adults and reach similar conclusions. These researchers analyze data from the Monitoring the Future (MTF) project, which tracks a nationally representative sample of successive cohorts of high school seniors beginning with the class of 1976. The Bachman et al. study uses data for the graduating classes of 1976 to 1994.

As with studies analyzing NLSY data, the Bachman et al. study finds that the frequency of heavy alcohol use among young adults declines around the time of entry into first marriage and that this result is similar for men and women. These researchers also find that being engaged reduces heavy alcohol use for both men and women, with the effect of being engaged somewhat smaller than the effect of being married. Moreover, this study finds that heavy alcohol use increases at the time of divorce for both men and women and that the magnitude of this increase in heavy drinking is similar to the decline in heavy drinking associated with marriage.

These researchers also find substantial declines in marijuana use around the time of first marriage for both men and women. However, the declines in marijuana use associated with marriage are substantially larger for men. Similar to their results for heavy drinking, these researchers find that being engaged also reduces marijuana use; however, it has a smaller effect than being married. The Bachman et al. study also finds increases in marijuana use associated with divorce for both men and women.

Additional analyses by these authors indicate that much of the negative effect of marriage on marijuana and heavy alcohol use is due to the negative effect marriage has on the frequency of going out at night for social events (Bachman et al. 2002). The effect of marriage on general attitudes toward drinking and the kinds of friends people have also appear to play a role in marriage's negative effect on substance use.

Effects Among Older Americans

The effect of marital transitions on the substance use of older Americans has been studied much less extensively than it has for younger adults. No nationally representative rigorous evidence (in other words, evidence based on a large, longitudinal sample that can closely align the timing of changes in substance use with marital transitions) on the link between marriage and substance use among older Americans is currently available. However, two recent rigorous studies of the effects of marriage on the health behaviors of health professionals—one of men and the other of women—by researchers at the Harvard

School of Public Health provide evidence on the effect of marriage on the alcohol consumption of older Americans—albeit on a nonrepresentative sample. Health professionals in particular may respond differently from other adults to marriage in terms of changing their health behaviors, so these results may not be consistent with what would be observed in a study of the general population. Even so, these studies represent the best evidence currently available on the effect of marriage on the health behaviors of older Americans. These studies examine the effects of marital transitions on alcohol consumption, but they do not examine the effects of marriage on drug use.

The Harvard study of male health professionals examines a large sample of dentists, veterinarians, pharmacists, optometrists, and other health specialists who were ages 40 to 75 in 1986 (Eng et al. 2005). The study examines their marital transitions (remarriage, divorce, and widowhood) over a four-year period and relates those transitions to changes in their alcohol consumption over the same time period. These researchers find that becoming widowed is associated with an increase in alcohol consumption of an additional half serving per week—a six percent increase in the amount of alcohol consumed. In contrast, remarriage and divorce do not have statistically significant effects on alcohol consumption.

The Harvard study of female health professionals uses a similar methodology and examines a large sample of nurses who were ages 46 to 71 in 1992 (Lee et al. 2005). The results of this study show no clear patterns of the effect of marriage on alcohol consumption. In addition, because the researchers conducted their analysis separately for initial abstainers and initial drinkers, the results are somewhat difficult to interpret. Among those who did not drink at all at baseline, widowhood is associated with a significant increase in the likelihood of beginning to drink. However, remarriage also is associated with an increased likelihood of drinking among initial abstainers, while divorce has no effect. Among those who did drink initially, widowhood and divorce are associated with decreases in alcohol consumption (with the effect of divorce just missing statistical significance), while remarriage has no effect.

Summary of the Evidence on Marriage and Substance Use

The link between marriage and substance use has been studied most extensively among younger adults. Recent research in this area consistently finds that entry into first marriage is associated with a significant decline in heavy drinking and overall alcohol consumption among young adults and that the effect of marriage on alcohol use is similar for men and women. For drug use, recent studies suggest a significant negative effect of entry into marriage on the marijuana use of young men and a smaller (and possibly insignificant) effect of marriage entry on the marijuana use of young women. In addition, entry into first marriage is associated with a decline in alcohol consumption and marijuana use for both African Americans and whites. However, some research suggests this effect is smaller for African Americans, while other research indicates that the effects of marriage on substance use are similar for these two racial groups. Less research has been done examining the effects of marriage exits on the substance use of young adults. However, the research that has been done suggests that exiting marriage increases alcohol consumption and marijuana

use for both men and women and that the magnitude of the increase is similar to the magnitude of the decrease associated with marriage entry for young adults.

The evidence on the effect of marriage on the substance use of older Americans is more limited, and it is based on nonrepresentative samples. For older men, the evidence suggests that widowhood is associated with increased drinking, while other marital transitions have no effect on alcohol consumption. For older women, the evidence on the effects of marriage on alcohol consumption is mixed, with no clear patterns emerging. These results are based on nonrepresentative samples of health professionals and may not generalize to the full population of Americans. Therefore, understanding more fully the effects of marital transitions on the substance use of older Americans would be a useful goal of future research.

EFFECTS OF MARRIAGE ON SMOKING

Relatively little rigorous research has been done in recent years on the link between marriage and smoking in U.S. populations. In addition, the research that has been done has yielded limited evidence that marriage reduces cigarette smoking. For example, the Duncan et al. study (2006) (discussed in the previous section), which examines NLSY data, finds no evidence that entry into first marriage reduces the likelihood of smoking or the number of cigarettes smoked for young men. Moreover, this study finds that entry into first marriage is associated with a significant *increase* in the likelihood of smoking for women.

The Bachman et al. (1997) study (also discussed in the previous section), which analyzes MTF data, also examines the relationship between smoking and marital transitions among young adults. These researchers also find little or no evidence of an effect of entry into first marriage on smoking. In contrast, they find that, for both young men and women, divorce leads to a fairly substantial increase in the likelihood of smoking, while remarriage after divorce leads to a similarly large decline in the likelihood of smoking.

The two studies of health professionals described in the previous section also examine the effects of marriage on smoking. The Eng et al. study (2005), which examines the effects of marriage on the health behaviors of older male health professionals, finds no significant effects on cigarette smoking of divorce, widowhood, or remarriage. In contrast, the Lee et al. study (2005), which examines the effects of marriage on the health behaviors of a cohort of older female nurses, finds that marriage is associated with a reduced likelihood of smoking. In particular, among those women who smoked initially, widowhood reduced the likelihood of quitting, while remarriage increased this likelihood. Similarly, among those who did not smoke initially, both divorce and widowhood increased the likelihood of starting to smoke.

The few recent rigorous studies that have examined the effects of marriage on smoking find limited evidence of a reduction in smoking associated with marriage. These studies find some evidence that marriage may reduce smoking among older women, as well as among younger adults who divorce. Among other groups, the available evidence suggests either that marriage has no effect on smoking or, in one case, that marriage may increase smoking.

The fairly limited and conflicting evidence on the effects of marriage on smoking makes this an important topic for future research to examine further.

EFFECTS OF MARRIAGE ON BODY WEIGHT

Several recent rigorous studies of U.S. populations have examined the effects of marriage on body weight. The strongest studies in this area (in other words, those based on longitudinal data and large samples) consistently indicate that marriage is associated with a small weight increase for both men and women. In this section, we summarize the evidence from the most rigorous recent studies on this topic based on U.S. samples.

Studies of Nationally Representative Samples

Some of the strongest evidence concerning an effect of marriage on body weight comes from several studies that have analyzed data from the National Health and Nutrition Examination Survey I (NHANES-I). This nationally representative survey was originally conducted from 1971 to 1975; a follow-up survey with this sample was conducted approximately 10 years later. These data are particularly well suited for examining issues concerning body weight because weight was measured directly at both baseline and followup and is not based on self-reports.

Kahn and his colleagues conducted two studies using NHANES-I data—one of men and the other of women—that examined the effect of marriage on body weight (Kahn and Williamson 1990; Kahn et al. 1991). These researchers restrict their samples to those who were 25 to 44 years old at baseline. These studies find that—for both men and women—transitions into marriage were associated with statistically significant weight gain over the 10-year follow-up period relative to what would have been expected if they had remained unmarried. Similarly, for both men and women, transitions out of marriage were associated with statistically significant weight loss, relative to what would have been expected if they had remained stably married. However, for both men and women, the weight changes associated with these marital transitions are small. In their analyses of both men and women, these researchers' estimates suggest a change in body weight associated with a change in marital status of less than five pounds over a 10-year period.

Sobal and his colleagues (2003) reanalyzed the NHANES-I data examining a broader age range of adults than was included in the studies by Kahn and his colleagues. Sobal et al. studied people who were ages 17 to 74 at baseline and found results similar to those of these earlier studies. As in the earlier studies, they find a connection between marriage and body weight for both men and women. In addition, as with the earlier analyses of NHANES-I, they find that changes in marital status are associated with changes in body weight of less than five pounds.

Studies of Nonrepresentative Samples

Additional evidence of the effect of marriage on body weight is available from studies of nonrepresentative samples. For example, Jeffery and Rick (2002) examine data from the

Healthy Worker Project, which surveyed a sample of employed adults in the Minneapolis-St. Paul metropolitan area from 1987 to 1991 and again two years later. As in NHANES-I, these data include direct (rather than self-reported) measures of weight and height at baseline and followup. These researchers find that—relative to those who experienced no change in marital status—transitions into marriage were associated with increases in body weight over a two-year follow-up period for both men and women (although this effect is only statistically significant for women), while transitions into marriage were associated with statistically significant weight increases for both men and women. These results suggest a somewhat stronger effect of marriage on body weight for women than on men and somewhat stronger effects than those found in studies using the nationally representative NHANES-I data. Even so, their estimates suggest a relatively small effect of marriage on weight. For a woman of average weight and height, their results suggest that getting married is associated with a weight increase of about six pounds over the study's two-year follow-up period. Their estimated effects on body weight of transitions out of marriage for women, as well as both transitions into and out of marriage for men, are somewhat smaller (about two to four pounds).

The two studies of health professionals described earlier in this chapter also examine the effects of marriage on body weight (Eng et al. 2005; Lee et al. 2005). Consistent with other studies examining this issue, these studies find that marriage is associated with weight gain for both men and women and that the magnitude of this effect is small. In particular, these studies find that, among older health professionals, transitions out of marriage are associated with a statistically significant decline in weight over the four-year follow-up period (relative to those who remained married), while transitions into marriage are associated with a statistically significant weight increase (relative to those who remained unmarried). As in the Jeffery and Rick study, these researchers find that these effects are somewhat larger for women. As in the earlier studies, their results suggest that—for both men and women—the change in weight associated with a change in marital status is small—less than five pounds over a four-year period.

Both these studies of health professionals also examine the effects of marital transitions on diet. For both men and women, they find some evidence that those who are married eat better—in particular, that they eat more vegetables. However, these studies also find that those who are married eat more starches (such as refined grains and potatoes), which may explain, in part, the weight gain associated with marriage.

Summary of the Evidence on Marriage and Weight

Evidence from several recent rigorous studies suggests that marriage is associated with modest weight gain for both men and women. In addition, there is some evidence that the effect of marriage on body weight may be larger for women. For both men and women, the estimates from these studies suggest relatively modest weight gain associated with marriage—in most cases, an increase of less than five pounds. Therefore, although substantial increases in body weight are associated with many adverse health outcomes, these modest weight increases may be too small to have substantial effects on a person's overall health.

EFFECTS OF MARRIAGE ON PHYSICAL ACTIVITY

Relatively little research using longitudinal samples has been done in recent years on the link between marriage and physical activity. The only recent studies of this type conducted on U.S. populations are the two studies of health professionals described earlier, which examine the effects of transitions into and out of marriage on the level of physical activity among older adults (Eng et al. 2005; Lee et al. 2005). These studies measured physical activity by asking respondents to report the typical amount of time they spent in various aerobic activities during the past year. This information was then converted to metabolic equivalents (METs), a standard unit measuring the amount of energy expended through these activities.

Both studies find some evidence that marriage is associated with lower levels of physical activity. For example, the study of male health professionals finds that remarriage leads to a significant decline in the level of physical activity relative to those who are otherwise similar but remain unmarried, while divorce and widowhood have no effect. The study of female health professionals also provides some evidence that marriage reduces the level of physical activity; however, it finds a somewhat different pattern of results. In particular, these researchers find that, among older women, divorce is associated with an increase in physical activity, while remarriage and widowhood have no effect.

A recent study by Nomaguchi and Bianchi (2004) uses cross-sectional data to examine the relationship between marriage and physical activity. In particular, they analyze detailed time use data collected in 2000 as part of the National Health Interview Survey, a large, nationally representative sample. Because this study is not based on longitudinal analysis—relating changes in marital status to changes in levels of physical activity—it is not able to control as carefully for differences between those who are married and those who are not. These researchers adjust their estimates for the presence of young children, hours of work, age, ethnicity, education, and income. However, they cannot adjust for unobserved differences between married and unmarried people that do not vary over time, as longitudinal studies can. Therefore, their results should be interpreted more cautiously than those of the other studies discussed in this chapter.

Nomaguchi and Bianchi find that married men spend substantially less time exercising than their unmarried counterparts. Their estimates suggest that married men exercise about an hour and 15 minutes less each week (or 30 percent less) than do similar unmarried men. Marriage is also associated with less time spent exercising for women; however, the difference for women between those who are married and those who are not is much smaller than it is for men. Nomaguchi and Bianchi find that married women exercise about 20 minutes less each week (or 15 percent less) than do similar unmarried women.

Part of these substantial differences in time spent exercising between those who are married and those who are not may arise because those who particularly enjoy spending time in individual activities such as exercise may be less likely to marry. However, Nomaguchi and Bianchi also find that married men exercise substantially less than similar widowed men,

a difference that seems unlikely to be due to unobserved differences between these two groups. Therefore, their results suggest that the lower rate of exercise among those who are married—particularly married men—relative to those who are not represents, at least in part, a causal relationship between marriage and exercise.

SUMMARY OF RESULTS

Recent research suggests that marriage has significant effects on the health behaviors of both men and women. However, the pattern of these effects is mixed—with marriage associated with healthier behaviors in some cases and less healthy behaviors in others. In particular, recent studies consistently indicate that for young adults marriage reduces alcohol use for both men and women. Although the research is less extensive, marriage is also associated with reduced marijuana use for young men; however, it appears to have smaller effects on the drug use of young women. In contrast, studies of marriage and smoking reveal no consistent pattern of results and suggest that marriage may have little or no influence on this health behavior.

Unlike the studies of alcohol and drug use, studies of the effect of marriage on weight and physical activity suggest that marriage may have negative effects on healthy behaviors. In particular, evidence from rigorous research studies consistently indicates that marriage leads to modest weight increases for both men and women. The research on the effects of marriage on physical activity is less extensive and conclusive. However, the available evidence suggests that marriage leads to reductions in physical activity—particularly for men.

CHAPTER III

THE EFFECTS OF MARRIAGE ON HEALTHCARE ACCESS, USE, AND COSTS

The effects of marriage on health care access and use may also contribute to the overall effects of marriage on health. For example, just as spouses may influence health-related behaviors such as diet and alcohol use, they might also encourage the use of preventive health services such as cancer screenings or regular physical exams. Marriage might improve access to care by increasing the material resources available to purchase care or by providing access to a spouse's health insurance policy. To the extent that marriage affects patterns of health care access and use, it might also have consequences for an individual's health care costs.

In this chapter, we review evidence on the effects of marriage on three main health care outcomes: (1) health insurance status, (2) health care use, and (3) health care costs. We focus on these outcomes because they capture an individual's main interactions with the formal health care system at different points in adulthood and at varying levels of health and illness, from the point of acquiring health insurance and seeking preventive health services to the more intensive care and high health care costs associated with health decline and old age.

As in the previous chapter on health behaviors, we focus on evidence from longitudinal studies. The studies we review examine how transitions into and out of marriage lead to subsequent changes in patterns of health care access and use. Studies of marital transitions provide the most rigorous evidence on the links between marriage and health care outcomes because they help separate the effect of marriage from the effects of unchanging personal characteristics. Studies of marital transitions also help distinguish the causal effect of marriage from the effect of people selecting into marriage on the basis of health care behaviors or access to care.

HEALTH INSURANCE STATUS

Marriage may improve access to health care by increasing access to health insurance. For unmarried people without a regular source of insurance, marriage often affords the opportunity to become insured as a dependent on a spouse's health insurance policy. The

option of dependent coverage also provides some protection against becoming uninsured in the event of a job loss, a career change, or the decision to stop working to return to school or raise children. Even when both members of a couple have their own source of insurance, marriage improves access to care by providing some freedom to combine health plans or to choose the best option among several plans.

Much of the research on marriage and health insurance coverage consists of basic descriptive analyses comparing differences in insurance rates among married and unmarried people. These studies show that, among working-age adults, married men and women are more likely than those who are unmarried to have health insurance (Jovanovic et al. 2003; Meyer and Pavalko 1986). These studies also find that married adults are more likely to have employer-sponsored insurance than unmarried adults are and are less likely to have government-sponsored insurance through programs like Medicaid. However, such basic descriptive comparisons do not control for background differences between those who are married and those who are not and, therefore, do not adequately assess the effect of marriage on insurance coverage. Most research in this area focuses on patterns of insurance coverage among working-age adults, because marriage becomes a relatively less important determinant of insurance coverage after age 65, when both married and unmarried people become eligible for public health insurance through the Medicare program. Studies also tend to focus more on women's insurance coverage than on men's, because women depend relatively more on dependent spousal coverage as a source of health insurance, as we discuss below.

Some of the most compelling evidence on the links between marriage and health insurance coverage comes from a longitudinal study by Short (1998). This study uses survey data for a large national sample of men and women in the 1990-1992 panel of the Survey of Income and Program Participation (SIPP) to examine how transitions out of marriage affect the chances of becoming uninsured in the following eight months. Like most studies in this area, Short's study focuses on patterns of insurance coverage among working-age adults (ages 19 to 64), excluding any young adults who qualify as dependents on a parent's insurance policy. The study examines trends separately for men and women.

The study finds that, for both men and women, transitions out of marriage frequently lead to the loss of private health insurance. The chances of becoming uninsured in the eight months after the loss of a spouse are 23 percent for married women and 14 percent for married men. These figures include spousal losses due to widowhood, separation, or divorce. The study does not report the chances of becoming uninsured over a similar eight-month period for people who remained in stable marriages. However, focusing on changes in insurance coverage over a longer two-year period, the study finds that the chances of becoming uninsured are about 10 percent for married men and 8 percent for married women, suggesting that martial disruption increases the risk of insurance loss and that the effect appears particularly large for women. The larger effect of marital disruption for women suggests that wives depend relatively more on their husbands for health insurance than husbands depend on their wives. In gauging the relative importance of marriage in relation to other determinants of insurance coverage, the study finds that married women

have about the same chances of becoming uninsured after a marital dissolution as after a job change in the family.

However, the study also finds that the chances of becoming uninsured after a family member's job change also vary by marital status. For example, results show that married women have about a 16 percent chance of becoming uninsured after they or their husbands lose their jobs, but that single women have about a 34 percent chance of becoming uninsured after a job loss. Single women are at greater risk of becoming uninsured after a job loss in part because they cannot fall back on dependent coverage through a spouse's policy. The study did not examine whether marriage has a similar protective effect among men who lose their jobs.

HEALTH CARE USE

Other research shows that, in addition to improving access to health care (as measured by access to health insurance), marriage shapes patterns of health care use. Spouses can influence health care use by monitoring a partner's behaviors, helping a partner navigate the formal health care system to find appropriate and high-quality care, and providing basic social support services (such as transportation to doctors' appointments) and informal postoperative care after surgeries or other medical procedures. To the extent that married people view keeping in good health as part of their overall commitment to marriage, they might also have more motivation to seek necessary health care services.

The strongest evidence on marriage and health care use focuses on two main types of services: (1) preventive health services, and (2) hospital care. Research on the effects of marriage on preventive health services is fairly limited and focuses mostly on the connection between marriage and the use of cancer screenings. Research on hospital care focuses on a wider range of outcomes, including frequency of hospital stays, length of hospital stays, and quality of hospital care. Most of this research focuses on patterns of health care use among older adults, most likely because health care use increases as people age.

Preventive Health Services

There is no rigorous evidence in nationally representative data that links transitions in marital status to changes in the use of preventive health services. Instead, the best evidence in this area comes from the Harvard study of female health professionals described in Chapter II (Lee et al. 2005). In addition to providing evidence on the health behaviors discussed in the previous chapter, the study provides evidence on the links between marriage and women's use of breast cancer screenings.

The study uses longitudinal data for a large nationwide sample of nurses to relate changes in marital status over a four-year period to women's decisions to skip regular mammograms. The women ranged in age from 46 to 71 at the beginning of the study period. To account for possible differences among women in their willingness to seek care or other factors predictive of health care use, the study focuses only on women who reported having received a mammogram in the two years preceding the study period. The study's statistical

models also control for age, employment status, and preexisting chronic health conditions and health risk behaviors.

The study finds that transitions out of marriage due to either widowhood or divorce increase women's odds of skipping regular breast cancer screenings. Widowhood increases the odds by roughly 24 percent, divorce by roughly 27 percent. For women previously widowed or divorced, the study finds no evidence that remarriage reduces the odds of skipping regular breast cancer screenings relative to remaining unmarried. The finding of an effect on the likelihood of cancer screening for marital dissolution but not for marital reentry suggests that these patterns may not reflect only the increased likelihood of cancer screenings for those who are married. Instead, the trauma associated with the loss of a spouse may play an important role in the likelihood of skipping these screenings.

Limited evidence from other studies in this area suggests that similar results hold for other types of cancer screenings, for broader and more representative samples of the U.S. population, and for both men's and women's health care use (see, for example, Goodwin et al. 1987; Osborne et al. 2005). However, this evidence consists largely of basic descriptive comparisons that do not adequately account for the effects on health care use of other personal characteristics. Thus, an important area for future research is to extend the analysis of marriage and preventive health services to broader samples of the population and a wider range of health services.

Hospital Care

Other studies show that marriage also affects the use of more intensive health services like hospital care. Some of the most compelling evidence on marriage and hospital care comes from a recent study by Iwashyna and Christakis (2003), which uses administrative records for more than 600,000 newly diagnosed, seriously ill Medicare beneficiaries to examine the effects of marriage on hospital choice, length of hospital stay, and quality of hospital care as measured by early readmission. Members of the study sample are all over age 65, with an average age of just over 79.

Unlike the other studies we review in this section, the Iwashyna and Christakis study uses cross-sectional, rather than longitudinal, data. Even so, we feature this study because it uses other rigorous statistical methods to help separate the effect of marriage on hospital care from the effects of other related personal characteristics. For example, to account for the possibility that married people are more likely to live in areas with higher quality hospitals or that the effect of marriage on hospital care varies depending on the number and type of hospitals available in a local area, the study uses multilevel regression models that adjust for a patient's local county of residence.[1] The study uses a similar method to assess the effect of marriage on length of hospital stay and quality of hospital care controlling for

[1] In effect, these models estimate the relationship between marriage and hospital care separately for each local county represented in the data, and then average these county-specific relationships to yield the overall relationship for the entire study sample.

hospital choice. Differences in health insurance are not a major concern in this study, because the patients in the study sample all received the same source of public insurance through the Medicare program. The study adjusts for differences in health between married and unmarried people by comparing patterns of hospital use only among people with similar health problems. The study also adjusts for basic demographic characteristics such as age and race; however, it cannot adjust for individual income, education, or other socioeconomic characteristics, because this information is not included in the Medicare data. The study also examines possible gender differences in the effect of marriage on hospital care.

The study finds that, compared with widows, married people receive care in higher-quality hospitals. This relationship holds for several measures of hospital quality, including the hospital's placement on national rankings of hospital performance, the presence of a residency program in the hospital, and the hospital's score on a broad index of medical technology. The study also finds that married people have shorter average hospital stays but do not receive significantly higher-quality hospital care (as measured by early readmission), controlling for hospital choice.

The findings for hospital choice may reflect the help married men and women receive from their spouses in navigating the formal health care system and choosing a high-quality health care provider. Married people may also have more economic resources to afford care in high-quality hospitals. The effect of marriage on length of hospital stay likely reflects the ability of spouses to reduce the need for long hospital stays by providing informal care at home. However, even with shorter average hospitals stays, married people receive hospital care that is similar in quality to the care received by those with longer hospital stays and are not at higher risk for early readmission.

The study finds no major gender differences in the effect of marriage on either hospital choice or quality of hospital care (controlling for hospital choice). However, there are significant gender differences in the effect of marriage on length of hospital stay, such that the relationship is strongest for men. For men, the effect of marriage on length of hospital stay is similar in size to the effect of being seven years younger. In other words, married men have the same average length of hospital stay as widowed men who are seven years younger. For women, the effect of marriage on length of hospital stay is similar to the effect of being three years younger. The fact that the effect is stronger for men suggests that wives are more likely than husbands to provide the types of informal home care necessary to shorten the length of hospital stays.

However, little evidence exists that marriage affects the frequency of hospital stays. For example, Wolinsky and Johnson (1992) use data from the 1984 and 1986 waves of the national Longitudinal Study of Aging (LSOA) to examine the effect of widowhood on a range of measures of health services use, including hospital stays. The study sample consists of more than 4,000 men and women ages 70 and older. The study compares the frequency of hospitals stays among married and recently widowed adults at the end of the two-year study period, adjusting for differences in hospital use at the beginning of the period. The study also adjusts for differences in health status, insurance coverage, and basic social and demographic factors like gender, race, and education level.

The study finds no significant effect of widowhood on the frequency of hospital stays. Rather, it finds that older adults are equally likely to need occasional hospital care, regardless of marital status. These findings do not run counter to the evidence presented in the Iwashyna and Christakis study. Rather, they help specify how spouses influence the use of hospital care. In particular, the results of these studies suggest that spouses affect hospital care less by reducing the occasional need for such care than by influencing the type and length of care received when the need arises. Other national studies similarly show little relation between marriage and frequency of hospital stays (see, for example, Prigerson et al. 2000, described below).

HEALTH CARE COSTS

Given evidence that marriage affects health care access and use, it follows that marriage may also affect a person's total health care costs. There is currently little direct research evidence showing a causal effect of marriage on health care costs among the U.S. population. However, it is possible to draw some conclusions about the links between marriage and health care costs through indirect evidence from studies of the effect of marriage on the use nursing home care and other high-cost health services.

Some of the best evidence on the effects of marriage on health care costs comes from a study by Prigerson et al. (2000). This study uses nationally representative data from the longitudinal Americans' Changing Lives study to examine the effect of marriage and widowhood on health care costs over a three-year period from 1986 to 1989. The study examines how changes in health care costs over the three-year study period relate to transitions out of marriage. The study focuses on adults at least 50 years old and combines data for men and women to increase the sample size. The study finds that, relative to men and women who became widowed during the study period, those who remained married had significantly lower annual health care costs in the last year of the study, controlling for the level of annual costs observed at the beginning of the study. The study estimates the total gap in annual health care costs in the last year of the study as roughly $443 in 1989 dollars.

Study participants were not asked directly about the amount they spent on health care costs. Rather, researchers inferred costs by estimating the average cost of four common types of health services that study participants used and reported: (1) physician visits, (2) psychiatrist visits, (3) nursing home stays, and (4) hospital stays. The study finds that married men and women reported significantly fewer physician visits than did widowers and had lower rates of nursing home stays, and that these differences in turn largely explain the gap in total health care costs. The study finds no significant differences between those who are widowed and those who are married in the frequency of psychiatrist visits or hospital stays; however, the study does not examine the effect of marital status on the length of hospital stay, as the Iwashyna and Christakis (2003) study described earlier does. Marriage might also lower health care costs by shortening the average length of hospital stays—thus creating another potential source of cost savings not captured by the Prigerson et al. study.

Other studies provide indirect evidence on the effect of marriage on health care costs by showing that married people often replace expensive end-of-life care with more informal care at home. For example, Freedman (1996) finds that marriage reduces the risk of nursing home admission among older men and women by roughly 50 percent. This study tracks the nursing home use of a sample of 2,606 older men and women in New Haven, Connecticut, from 1982 to 1989. The statistical analyses use event history regression models that estimate the effect of marriage on the risk of nursing home admission after adjusting for differences in gender, ethnicity, income, and the presence of adult siblings or children in the household. Additional analyses test for gender differences in the effect of marriage on nursing home use.

Results of the study show that, for both men and women, the risk of nursing home admission increases with age, but it is significantly lower at all ages among married men and women than among singles. The effect of marriage on nursing home use is slightly greater for men than women. Although these specific results apply only to a particular local sample of older men and women, other studies show similar effects of marriage on nursing home use in nationally representative data (see, for example, Wolinsky and Johnson 1992, described earlier in this chapter). Given the high costs of nursing home care, it follows that marriage should also reduce health care costs for end-of-life care. However, there is no currently rigorous evidence available testing this hypothesis with nationally representative data.

SUMMARY OF RESULTS

The evidence to date suggests that marriage does indeed affect patterns of health care access and use. In particular, research shows that married people have better access to private health insurance, have shorter average hospital stays, receive care in higher-quality hospitals, are less likely to receive end-of-life care in nursing homes or other institutional settings, and may incur lower health care costs. Limited evidence from non-representative samples of health care professionals also suggests that married people may be more likely to use preventive health services like cancer screenings.

Studies find similar effects of marriage on health care outcomes for both men and women. However, the strength of these effects varies by gender. For outcomes related to the provision of informal care and basic social support services—namely, length of hospital stay and risk of nursing home admission—the effect of marriage is stronger for men than for women. However, for outcomes related to health insurance coverage, the effect of marriage is stronger for women.

CHAPTER IV

THE EFFECTS OF MARRIAGE ON MENTAL HEALTH

Marriage may have important influences on mental health. A happy marriage may provide substantial emotional benefits. For many people, marriage creates an important sense of identity and self-worth (Gove et al. 1990). Moreover, a spouse may provide emotional intimacy and support, fulfilling an essential human need for connection (House et al. 1988). Consequently, married people may be happier, more satisfied, and less depressed than those who are unmarried. These emotional benefits may, in turn, improve their physical health, by reducing the toll stress, depression, and other mental health problems can take on physical well-being.

In this chapter, we focus on one particular dimension of mental health—depressive symptoms. This focus is appropriate, for several reasons. First, depression is one of the most common psychiatric disorders and can be highly debilitating (Kessler et al. 1994; Menaghan and Lieberman 1986; Turner and Lloyd 1999). Second, depression is highly correlated with physical health outcomes (Ross et al. 1990), as well as other psychiatric disorders (Kessler et al. 1994), making it of particular interest for our review. Finally, because of their malleability, depressive symptoms may be particularly sensitive and responsive to marriage and changes in marital status, increasing the likelihood of finding significant effects of marriage on this health outcome.

We begin this chapter by discussing how marriage can be both a cause and an effect of mental health status and the challenges that poses for estimating the effect of marriage on mental health outcomes. We then summarize four recent studies of the effect of marriage on depressive symptoms, all four of which use the same large, longitudinal, and nationally representative research sample. Next, we summarize the findings of several other recent studies that examine the effect of marriage and marital transitions on depressive symptoms. We end the chapter by summarizing results across all these studies.

THE LINK BETWEEN MARRIAGE AND MENTAL HEALTH

Marital status may both affect mental health and be affected by it. In particular, marriage may reduce depressive symptoms through its effects on social support and intimate

connection. It is also possible, however, that those with fewer depressive symptoms may be more likely to get and stay married, because they may be viewed as more attractive marriage partners. Moreover, this selection of less depressed people into marriage may explain all or part of the correlation between marital status and depression. Therefore, only studies that carefully address and control for selection can provide persuasive evidence of a causal effect of marriage on depressive symptoms.

In general, studies relying on cross-sectional data cannot isolate the effect of marriage on depressive symptoms, because these studies cannot adequately control for the differences in background characteristics between those who marry and those who do not. Studies that use longitudinal data are better able to control for possible selection of those with better mental health into marriage in one of two ways: (1) by controlling for measures of baseline mental health, or (2) by focusing on changes in depressive symptoms associated with transitions into or out of marriage.

Even studies based on longitudinal data can have limitations, however. For example, in some studies of this type, controls for "baseline" mental health may involve measures from an arbitrary point (often the first year of data collection) that may have occurred before marriage for some sample members and many years after marriage for others. Controlling for baseline health in this way may cause some of the positive impacts of marriage on alleviating depressive symptoms to be obscured. In particular, if the positive effect of marriage on mental health is cumulative, using a baseline measure of mental health collected after some sample members have married will generate estimates of the effect of marriage on depressive symptoms that omit the potential benefits of marriage from these earlier years.

Focusing on the effects of marital transitions eliminates this potential problem but may introduce others. Moreover, these potential problems may bias estimates of the effect of marriage in both positive and negative directions. For example, depressive symptoms may rise before a marital breakup as the quality of the marriage declines. Therefore, the change in depressive symptoms from a period shortly before the divorce to a period shortly after may underestimate the effect of the change in marital status on this outcome, because the effect of the divorce on these symptoms began before the divorce occurred. Similarly, improvements in mental health may occur in the period leading up to a marriage, because the person may have already entered into a committed and happy relationship and thus be experiencing mental health benefits. In this case, the change in depressive symptoms around the time of marital entry may underestimate the effect of marriage on depressive symptoms.

Focusing on marital transitions may also lead to an overestimation of the effect of marriage on depressive symptoms. The mental health benefits of marriage may be most pronounced in the early years of marriage and may diminish over time. Similarly, divorce and widowhood could cause a spike in depressive symptoms (which later moderate), as people must contend with upheaval and loss. Focusing on the periods immediately after these marital status changes may overstate the long-term impact of these transitions on depressive symptoms.

Some researchers have compared the mental health of those who are stably married (for example, over a five-year period) to those who remain unmarried for a number of years to estimate the "steady-state" effect of marriage on depressive symptoms. Unless adequate controls for baseline mental health are used, however, this methodology suffers from the same limitations as cross-sectional analysis, because those with better mental health may be more likely than others to get and stay married.

In this review, we focus on studies that estimate the effects of marriage on depressive symptoms by either (1) examining the link between marital transitions and depression, or (2) using controls for baseline mental health and comparing the depressive symptoms of those in stable marital states. Although these techniques are imperfect, the results are highly suggestive of the effects of marriage. In particular, these studies consistently find that transitions into marriage are associated with reductions in depressive symptoms, while transitions out of marriage are associated with increases in them.

RESULTS FROM THE NATIONAL SURVEY OF FAMILIES AND HOUSEHOLDS

Few data sets offer longitudinal data on marital status and depressive symptoms. The National Survey of Families and Households (NSFH), a nationally representative sample with two waves of data collection (1988-1989 and 1992-1994), is a rare exception. For this reason, many researchers have used it to examine the potential effects of marriage on depressive symptoms. Among the many studies that have used NSFH data to examine the link between marriage and depression, we have selected four recent ones that use strong methodologies that focus on the effects of marital transitions. These studies also compare the depressive symptoms of the stably married to those of the stably unmarried to provide additional evidence of whether marriage affects the prevalence of depressive symptoms. To highlight that these studies all use the same data set—and therefore do not offer wholly independent verification of a link between marriage and depression—we discuss the findings of these four studies together. Table IV.1 summarizes these studies and their results.

To measure the prevalence of depressive symptoms, these studies all use the Center for Epidemiological Studies-Depression (CES-D) index, a count of various depressive symptoms from the past week.[1] In addition, they all use both waves of the NSFH and control for baseline CES-D scores. Other covariates differ somewhat across the studies, though all include control variables associated with depressive symptoms. As Table IV.1 illustrates, the studies also vary somewhat in how they define their samples and which groups they compare to each other when determining the influence of marriage on depressive symptoms.

[1] The CES-D is a commonly used scale that discriminates between clinical and general depression, is sensitive to levels of severity, and has adequate test-retest reliability (Radloff 1977).

Table VI.I. Selected Studies Using The National Survey of Families and Households to Examine the Effects of Marriage On Depressive Symptoms

Study	Analytic Sample	Comparisons	Reference Group	Conclusions
Kim and McKenry 2002	Those with one marital or cohabitation transition (excluding widowhood), those 75 years old or younger	Eight marital status and cohabiting groups (for example, never married cohabitors who marry)	Continuously married	Remaining divorced and transitioning to divorce increases CES-D; entry into first marriage decreases CES-D. Baseline CES-D not associated with divorce.
Lamb et al. 2003	Never married or cohabiting by wave 1 and ages 18 to 35. Only one transition between waves 1 and 2	Those who entered cohabiting or marital relationship by Wave II	Continuously unpartnered	Entry into marriage decreases CES-D, more so for those who do not cohabit before marriage.
Marks and Lambert 1998	At wave 1, 19 to 34 or 40 to 60 years old	10 marital status categories, including those with more than one transition	Continuously unmarried	Being continuously unmarried leads to greater increase in CES-D. Transitioning to divorce increases CES-D. Effects may be stronger for younger people. Entering first marriage decreases CES-D.
Simon 2002	No restrictions	Marital loss, marital gain	Continuously married (for marital loss effect); continuously unmarried (for marital gain effect)	Marital loss increases CES-D, more for women. Marital gain decreases CES-D, though not for widowed. CES-D associated with later divorce.

These studies consistently indicate that marriage is associated with reductions in depressive symptoms. The fact that these studies reach similar conclusions suggests that this result is robust to variations in the choice of covariates, the particular estimation technique used, and the specific sample included in the analysis. We summarize the findings of these studies here:

- ***Marital entry decreases depressive symptoms.*** This result holds whether the comparison group is the continuously married (Kim and McKenry 2002; Marks and Lambert 1998) or the continuously unmarried (Lamb et al. 2003; Simon

2002). There is some evidence, however, that remarriage is less beneficial than first marriage (Kim and McKenry 2002) and that marriage preceded by cohabitation also is less beneficial (Kim and McKenry 2002; Lamb et al. 2003).

- ***Marital dissolution increases depressive symptoms, particularly for women.*** Marital loss increases depressive symptoms, relative to the increases experienced among those who remain married (Kim and McKenry 2002; Marks and Lambert 1998; Simon 2002). Furthermore, two of the studies suggest that the impact is greater for women than men (Marks and Lambert 1998; Simon 2002). However, another finds no gender difference (Kim and McKenry 2002).

- ***Those who are stably unmarried experience larger increases in depressive symptoms than do those who are stably married.*** Those who remained unmarried over the five-year follow-up period experienced larger increases in depressive symptoms than did similar people who were stably married over this period (Kim and McKenry 2002; Marks and Lambert 1998; Simon 2002).

- ***Depressive symptoms do not affect the likelihood of marriage.*** These studies consistently find that the initial prevalence of depressive symptoms does not affect the likelihood of marrying over the five-year follow-up period (Kim and McKenry 2002; Lamb et al. 2003; Simon 2002). The results were mixed, however, concerning whether those with more depressive symptoms were more likely to divorce, with one study finding that depressive symptoms increased the odds of divorce (Simon 2002) and another finding no effect (Kim and McKenry 2002).

RESULTS FROM ADDITIONAL DATA SOURCES

Although the studies of NSFH discussed in the previous section consistently point to an effect of marriage on the prevalence of depressive symptoms, it is important to examine the link between marriage and depression in other data sets to test the robustness of this result. Therefore, in this section, we summarize results from three other recent studies that use different data sets to examine the effect of marriage on depressive symptoms. One of these studies uses a different national sample; the other two use regional samples. To adjust for the possible selection of those with better mental health into marriage, these studies all use longitudinal data and control for baseline mental health.

Horwitz and his colleagues (1996) examine a sample of New Jersey adolescents and young adults and compare the depressive symptoms of those who were continuously never married over a seven-year follow-up period to those who entered marriage during this period. Consistent with the NSFH studies, they find that, after controlling for prior symptoms, those who married and stayed married had significantly fewer depressive symptoms than similar people who did not marry. Unlike the NSFH studies however, the Horwitz et al. study finds that only men experience reductions in depressive symptoms associated with marriage; the study finds no significant effect of marital entry on the depressive symptoms of women.

Johnson and Wu (2002) analyze data from a national probability sample of married adults to examine the effects of divorce on psychological distress. The data set, which tracked sample members over a 12-year period through four rounds of data collection, is representative of all married adults ages 19 to 55 in 1980. Johnson and Wu find that levels of unhappiness and distress increased in the years before divorce and remained elevated after dissolution. These patterns are similar for men and women.

Aseltine and Kessler (1993) examine a sample of married adults in the Detroit area to look at the effects of divorce on depressive symptoms. They find that those who divorced experienced larger increases in symptoms of distress than did similar sample members who remained married. These researchers control for prior depressive symptoms. Therefore, they may underestimate the effect of marital dissolution on depressive symptoms, if these symptoms increase in anticipation of the divorce. Unlike the Johnson and Wu study, the Aseltine and Kessler study finds that the effect of divorce on depressive symptoms is greater for women.

Both these studies find that the effect of divorce on depressive symptoms is long-lasting and does not appear to be a temporary "spike" in symptoms. Aseltine and Kessler (1993) find that depressive symptoms remain higher than pre-breakup levels up to three years after marital dissolution. Similarly, Johnson and Wu (2002) conclude that the number of years following disruption does not significantly reduce distress levels. The authors argue that the chronic stressors and strains associated with divorce, such as loss of a partner's income or single parenting, lead to long-term distress. Accordingly, these authors find that distress levels decline only upon remarriage or the formation of a cohabiting relationship (Johnson and Wu 2002).

SUMMARY OF RESULTS

The current research suggests that marriage—particularly transitions into and out of marriage—affects depressive symptoms for both men and women. In particular, marital entry decreases depressive symptoms, while marital dissolution increases them. Studies suggest that increases in depressive symptoms after divorce are long-lasting and that the prevalence of these symptoms remains elevated years after the marital breakup. In addition, studies that compare the mental health of stably married adults to those who are stably unmarried find that those who remain stably married have fewer depressive symptoms (and smaller increases in these symptoms over time) than do similar adults who remain stably unmarried—even after controlling for baseline mental health. Moreover, studies based on national data find little evidence that those with fewer depressive symptoms are more likely to marry, suggesting that studies comparing the depressive symptoms of the stably married to the stably unmarried should produce reasonable estimates of the effect of marriage on depressive symptoms.

More research—based on additional longitudinal data sets that offer more detailed histories of mental health changes and changes in marital status—is needed to confirm these patterns. To the best of our knowledge, however, more detailed national data are not

currently available. Nonetheless, the research that is currently available tells a consistent story—that, for both men and women, being married reduces the prevalence of depressive symptoms.

CHAPTER V

THE EFFECTS OF MARRIAGE ON PHYSICAL HEALTH AND LONGEVITY

The research evidence discussed in earlier chapters suggests that marriage (1) reduces certain health risk behaviors (in particular, heavy drinking); (2) improves access to health insurance; and (3) improves mental health (in particular, reducing depressive symptoms). Therefore, it follows that marriage may also have benefits for physical health and longevity. Indeed, studies consistently show that married people live longer and enjoy better physical health than unmarried people. This relationship has been found for more than 100 years (Murray 2000), for both men and women (Kaplan and Kronick 2006), in different countries (Brockmann and Klein 2004; Gardner and Oswald 2004; Hu and Goldman 1990; Manzoli et al. 2007; Matthews and Gump 2002), and for a wide range of measures of health and illness (Gore et al. 2005; Gove 1973; Krongrad et al. 1996).

However, much of the research evidence in this area is based on simple descriptive analyses that do not adequately distinguish the causal effect of marriage from the possible effects of healthier people selecting into marriage. This is partly because many of the methods researchers have developed to separate these effects (for example, relating transitions in marital status to subsequent changes in health behaviors or outcomes) do not easily transfer to studies of physical health and longevity. For example, because a person's longevity is undetermined until the very end of life, it is impossible to assess how longevity changes in response to a transition in marital status. Likewise, whereas a change in marital status might have an immediate effect on a person's health risk behaviors, health insurance status, or mental health, the possible consequences for most physical health outcomes (for example, the chances of developing a certain disease or chronic health condition) likely unfold over a longer time frame and would not be apparent in the period immediately after a transition into or out of marriage.

In this chapter, we review recent research evidence on the effects of marriage on physical health and longevity. We begin by reviewing evidence on the links between marriage and physical health, focusing on the few rigorous studies that relate transitions into or out of marriage to changes in physical health. Because few studies meet this criterion, however, we also review selected descriptive evidence to broaden the range of physical health outcomes covered. We then review evidence on the links between marriage and longevity. Although

many studies document a relationship between marriage and increased longevity, most consist of basic descriptive comparisons of differences in mortality rates between married and unmarried people over study periods of 10 to 20 years. We provide a brief overview of the main findings from this research, then turn to the few studies that use more rigorous methods to distinguish the causal effect of marriage from possible selection effects. A main conclusion of this chapter is that the research evidence on the effects of marriage on physical health is more speculative than the evidence on the effects of marriage on health risk behaviors, health insurance status, and mental health.

MARRIAGE AND PHYSICAL HEALTH

Little rigorous research evidence exists on the effect of marriage on physical health. Many studies suggest that poor marital quality can have a significant negative impact on physical health (for a review, see Kiecolt-Glaser and Newton 2001); however, few assess the effect of marriage itself. As with other health outcomes discussed in earlier chapters, the best studies in this area relate transitions into or out of marriage to subsequent changes in physical health. However, by concentrating on changes in physical health in the period immediately after a transition in marital status, these studies focus more on the short-term effects of marriage than on possible long-term effects. Because physical health problems become more common with age, studies in this area also focus more on the effect of transitions out of marriage for older adults (often widowhood) than the effect of transitions into marriage for younger adults. In this section, we summarize a few of the best studies of the links between marriage and physical health. Most of the studies we review suggest at least some benefit of marriage for physical health, but possible gender differences in the relationship remain unclear.

Effects on General Physical Health Status

A recent study by Williams and Umberson (2004) provides some of the most rigorous evidence on the effect of marriage on physical health. This study uses longitudinal data from the nationally representative Americans' Changing Lives (ACL) study to examine the effects of transitions into and out of marriage on changes in physical health. The data for the study were collected over an eight-year period from 1986 to 1994, when the sample members ranged in age from 24 to over 90. Like many studies in this area, the Williams and Umberson study measures physical health with a simple survey question that asks sample members to rate their health on a five-point scale ranging from "poor" to "excellent." The study's statistical models estimate the effects of marital transitions separately by gender and age group and include additional baseline controls for race, education, income, and employment.

Results of the study suggest that, regardless of age, the effects of marital transitions on self-rated health are generally larger for men than women. For both older and younger men, the transition into first marriage is associated with a significant improvement in self-rated health. For example, estimates show that, for men, the chances of reporting "very good" or "excellent" health improve significantly with the transition into first marriage. This positive effect persists through at least the first five years of marriage and applies equally to men of

all ages. In contrast, the study shows that marital dissolution has a significant negative effect on men's self-rated health, but only for men over age 50. For older men, self-rated health declines in connection with divorce. For younger men, however, divorce is associated with a modest improvement in self-rated health. Additional estimates show that, for older men, widowhood also has a significant negative effect on self-rated health.

For women, the study finds little evidence that transitions either into or out of marriage are related to changes in self-rated health, regardless of age. The transition into first marriage is associated with a small, statistically insignificant improvement in women's self-rated health. The study finds no relationship between marital dissolution and women's self-rated health. It does find some limited evidence of a positive effect of remarriage on self-rated health. However, this remarriage effect is only statistically significant for women under age 40, who are much less likely than older women to be entering a second marriage.

It is possible that, by using changes in self-rated health as a proxy for changes in physical health, the Williams and Umberson study understates the true causal effect of marriage on physical health and, thus, that the link between marriage and physical health is stronger than these results suggest. Although self-rated health is highly correlated with more objective physical health indicators, such as blood pressure, disability, and longevity (Ferraro and Farmer 1999), changes in self-rated health may be a poor proxy for changes in physical health. This could happen if, for example, people tend to rate their health in the same category from year to year, even as their health declines with age. Consistent with this possibility, in the Williams and Umberson study, most of the sample members rate their health as either very good or excellent (the top two categories), and the percentage of sample members reporting very good or excellent health declines only slightly with age. This pattern suggests that trends in self-rated health may not reflect more subtle changes in respondents' underlying physical health status, and that a more refined health indicator might show a significant effect of marriage on women's physical health and a stronger effect of marriage on men's physical health.

Effects on Other Measures of Physical Health

Other recent studies address this limitation by focusing on alternative physical health indicators. For example, the study by Prigerson et al. (2000), described briefly in Chapter III, uses longitudinal data from the ACL study to relate transitions in marital status to changes in (1) chronic health conditions (for example, arthritis, hypertension, and heart disease); and (2) limitations in physical functioning (for example, difficulty walking or getting around the house). Unlike the study by Williams and Umberson, the study by Prigerson et al. focuses only on the transition out of marriage due to widowhood. Because widowhood is uncommon among younger adults, the study also limits its analysis to men and women at least 50 years old at the beginning of the study period. To increase the sample size, the study combines data for men and women. The study's statistical models include baseline adjustments for age, gender, socioeconomic status, and mental health.

Their results suggest that widowhood is associated with increased limitation in physical functioning and an increased number of chronic health conditions. For example, adjusting

for the initial prevalence of these conditions, these researchers find that men and women who become widowed suffer from an average of 2.2 chronic health conditions at the end of the follow-up period, compared with an average of 1.8 chronic conditions among similar sample members who remain married. These results are similar to the estimates Williams and Umberson report for the effect of widowhood on men's self-rated health. However, because the study by Prigerson et al. does not report estimates separately by gender, it is unclear whether their results are due mostly to the effect of widowhood on men's health or, instead, apply equally to both men and women.

A recent study by Lorenz et al. (2006) focuses more specifically on the links between marriage and women's physical health by examining the effect of divorce on 10-year trends in physical health among a local sample of roughly 400 rural women in the state of Iowa. The study does not include men. The data for the study were collected throughout the 1990s, when most of the women were in their 40s. The study compares trends in physical health for a group of women who were recently divorced at the beginning of the study period with trends for a similar group of women who were married throughout the study period. Physical health is measured with a basic count of specific illnesses (for example, common colds or sore throats) and health conditions (for example, asthma or diabetes) experienced in the one-year period immediately preceding each survey interview.

The study finds a significant effect of divorce on 10-year trends in women's physical health. Estimates show that physical health did not significantly differ between married and recently divorced women at the beginning of the study period, controlling for baseline differences in age, education, and income. By the end of the period, however, the divorced women reported significantly worse physical health than the women who had remained married.

Because the social and economic consequences of divorce likely differ for women living in rural Iowa than for women living in other parts of the country, these findings may not generalize to the broader national population of women. The effect of divorce on physical health might also be different for men. However, the homogeneity of the study sample has the advantage of reducing the need to adjust for a detailed list of baseline characteristics and helps distinguish the effect of divorce from the effects of other personal characteristics. The results of this study also have implications for the Williams and Umberson study described earlier. In particular, by showing that divorce has a significant effect on women's physical health as measured by reports of specific illnesses and conditions, the results of this study support the possibility that the measure of self-rated health featured in the Williams and Umberson study may not be specific enough to find a significant effect of marriage on women's physical health.

Finally, a recent study by Zhang and Hayward (2006) examines the effect of marriage on the risk of cardiovascular disease, a leading cause of death in the United States for both men and women. The study is based on longitudinal data from the nationally representative Health and Retirement Survey, which has tracked a large sample of men and women in their 50s and 60s since the early 1990s. The data were collected through interviews conducted every two years over an eight-year study period. The study examines the association between

marriage and the risk of developing cardiovascular disease, controlling for basic demographic characteristics like race and age. To calculate this association, the study relates concurrent measures of marital status and cardiovascular disease assessed at each wave of the survey. By assessing marital status at each wave, the study can account for any changes in marital status occurring during the study period. However, because marital status and cardiovascular disease are always measured concurrently, the study cannot distinguish the causal effect of marriage from possible selection effects. Even so, we include the study in our review because there is so little evidence on the effects of marriage on specific indicators of physical health.

For men, the study finds no evidence of a relationship between marriage and risk of cardiovascular disease. For women, however, the results indicate that marital status is significantly associated with risk of cardiovascular disease. In particular, the study finds that risk of cardiovascular disease is about 60 percent higher for divorced women than it is for women in their first marriage and about 30 percent higher for widows than for women in their first marriage. However, because the study's statistical models measure marital status and cardiovascular disease concurrently, it is unclear whether these differences represent a causal effect of marriage or whether they represent the effect of cardiovascular disease in causing marital stress and disruption. Moreover, because the study does not adjust for initial health status prior to the assessment of either marital status or cardiovascular disease, it is also possible that the results represent the effect of poor initial health status in causing both marital disruptions and increased risk of cardiovascular disease.

MARRIAGE AND LONGEVITY

There are many more studies of the links between marriage and longevity than of the links between marriage and physical health. For example, studies have documented a relationship between marriage and longevity for both men and women (Kaplan and Kronick 2006); in the United States, as well as in several European and Asian countries (Manzoli et al. 2007); using historical marriage and mortality records, as well as more recent survey data (Murray 2000); and for a range of specific causes of death, including homicides, suicides, accidents, cardiovascular disease, infectious diseases like AIDS, and certain types of cancers (Gore et al. 2005; Kaplan and Kronick 2006; Krongrad et al. 2006).

However, the research evidence in this area is generally less rigorous than the research reviewed in earlier chapters, in part because it is impossible to relate transitions into and out of marriage to changes in longevity. In addition, researchers have had little success in developing other statistical methods to adequately distinguish the causal effect of marriage on longevity from the possible effects of selection into marriage on the basis of physical health or other personal characteristics. In this section, we summarize some of the main descriptive results in this area, as well as more limited results from the few studies that attempt to separate the protective effect of marriage from the effects of selection into marriage.

A recent review article by Manzoli et al. (2007) summarizes much of the research evidence on the links between marriage and longevity published since the mid-1990s. Their review focuses mostly on analyses of older adults (at least 65 years old) but includes analyses

of both domestic and foreign study samples. The review is limited to studies meeting some minimum research standards, such as controlling for age and gender. Using these criteria, Manzoli et al. identify 53 independent estimates of the effect of marriage on longevity from a total of 40 different studies. Of the 53 estimates included in the review, 18 are based on data for U.S. study samples.

The studies included in the review all estimate the effect of marriage on longevity by comparing mortality rates between married and unmarried people over study periods ranging from 3 to 21 years. On average, the studies show that mortality rates are about 18 percent lower for married people than unmarried people over the different study periods. Not all of the studies estimate the effect of marriage separately by gender. However, of the studies that do examine gender differences, the results show no major differences between men and women in the average effect of marriage on longevity.

A recent study by Kaplan and Kronick (2006) provides more detailed evidence on the links between marriage and longevity for the U.S. population. This study uses data from the nationally representative National Health Interview Survey to examine the effect of marriage on longevity over an eight-year period beginning in 1989. The sample members include both men and women and range in age from 19 to over 85. The study's statistical procedures use marital status at baseline to predict the odds of mortality during the eight-year follow-up period, adjusting for baseline differences in age, gender, race, education, income, and self-rated health.

Results of the study show that the odds of mortality are 39 percent higher for widows than for married people, 27 percent higher for those divorced or separated, and 58 percent higher for the never married. These figures are similar to those reported in an early study by Sorlie et al. (1995). Additional analyses show that the difference between the married and never married is larger for younger men than younger women but similar for both genders at older ages. The study does not report gender differences in the results for those who are divorced or widowed. Controlling for baseline health status helps reduce the possible bias caused by the selection of healthier people into marriage; however, it may also control for some of the health benefits of marriage and, thus, suppress the total effect of marriage on longevity. By not adjusting for changes in marital status, the study also likely misclassifies marital status at the time of death for some members of the study sample.

A more rigorous study by Lillard and Panis (1996) reports similar results using data from the longitudinal Panel Study of Income Dynamics. This study estimates the effects of marriage on men's longevity from 1984 to 1990. Sample members ranged in age from under 40 to over 80 when the data were collected. The study's statistical models examine the effect of marriage on men's mortality over the six-year follow-up period, controlling for baseline differences in race, age, and education, as well as for changes in marital status. The study compares the effect of marriage before and after controlling for (1) baseline differences in self-rated health (as measured on a five-point scale ranging from "poor" to "excellent"); and (2) an adjustment for selection into marriage that uses other information in the data to predict the effect of health and other personal characteristics on individual transitions into and out of marriage.

The study finds that the risk of mortality over the six-year study period was significantly lower for married men than for divorced, widowed, and never-married men, controlling for baseline demographic characteristics and changes in marital status. After controlling for baseline differences in self-rated health and the adjustment for selection into marriage, the study finds no significant difference between married and divorced men, but the gap between married men and both widowed and never-married men remains statistically significant.

A later study by Murray (2000) provides more rigorous evidence on the effect of marriage on longevity, but only for a highly select study sample. This study uses historical data for a select group of male Amherst College graduates born in the mid-19th century. One of the main strengths of the study is that the data include height and weight measurements for the men before they were married, as well as follow-up information on marital histories and eventual longevity. By using the weight and height information as a proxy for physical health before entry into first marriage, the study can estimate the effect of marriage on subsequent longevity while controlling for possible selection into marriage on the basis of physical health. Results of the study show that marriage reduces the conditional risk of men's mortality at any given any age by about 15 percent, controlling for premarital health and weight. The unique characteristics of the study sample caution against generalizing these results to other populations. The relationship between marriage and longevity might also be different for women, as well as for more recent cohorts. Even so, the study is important because it provides some of the only rigorous evidence showing that the apparent effect of marriage on longevity does not primarily reflect selection of healthier people into marriage.

CONCLUSIONS AND LIMITATIONS

The research evidence on the links between marriage on physical health and longevity is more limited than the evidence discussed in earlier chapters concerning the effects of marriage on other health outcomes. Few studies have used nationally representative data to rigorously assess the effect of marriage on physical health outcomes, and studies of the effect of marriage on longevity often rely on descriptive methods that do not adequately control for the possible selection of healthier people into marriage. Examining the effects of marriage on these outcomes by examining the effects of marital transitions is one useful strategy for addressing selection. However, measures of physical health generally do not lend themselves well to this technique.

Limited evidence from studies of physical health show a significant effect of transitions into and out of marriage on 5-year trends in men's self-rated health and a significant effect of divorce on 10-year trends in women's physical health. One study also shows an effect of widowhood on men's and women's chronic health conditions and ability to perform basic physical activities. There is little evidence on the links between marriage and specific health conditions or diseases, with the exception of one study that suggests a possible link between marriage and the risk of cardiovascular disease for women; however, the study finds no such effect for men. Therefore, the existing research evidence in this area is limited to a narrow

range of health measures and has not fully assessed the possible long-term consequences of marriage for physical health.

The strongest evidence of a positive effect of marriage on men's and women's longevity comes more from the robustness of this relationship across many studies than from the particular results of any single study. Many studies have documented a relationship between marriage and longevity; however, few use methods to distinguish the protective effect of marriage from possible selection effects. Moreover, the robustness of the relationship between marriage and health cannot alone establish a causal connection, if only because most of the research in this area may suffer from the same type of bias. A more definitive test of the effect of marriage on physical health and longevity will require very long-term longitudinal data that afford the opportunity to control for differences in initial health status measured before sample members begin to marry. With data of this type, researchers can examine how differing marital histories affect physical health, controlling for any initial health differences that may exist between those who marry and remain married and those who do not.

CHAPTER VI

THE INTERGENERATIONAL HEALTH EFFECTS OF MARRIAGE

Most of our review has focused on how marriage affects the health and health-related behaviors of the people involved in a marriage. However, mounting evidence suggests that marriage also has important long-term health consequences for a couple's children. Several articles have reviewed the research evidence concerning the effects of parental marital status on children's mental health and emotional well-being (Amato 2001; Amato and Sobolewski 2001). This literature suggests that children raised in two-parent families enjoy better mental health and greater life satisfaction as adults than do children raised in divorced or single-parent families. Because the literature on parental marital status and children's mental health has been summarized elsewhere, in this chapter, we focus on the relationship between parental marital status and children's physical health.

We focus specifically on a growing body of research examining the possible long-term effect of parental marital status in childhood on physical health outcomes experienced much later in adulthood. For example, one recent study in this area (reviewed later in this chapter) relates childhood family structure to the chances of developing various chronic and acute health problems in midlife and early old age (Maier and Lachman 2000). Other studies examine the possible links between childhood family structure and adult longevity.

Research on such intergenerational health effects is necessarily more speculative than the research we feature in the earlier chapters of this review. For example, due in part to the relatively limited availability of data linking childhood family structure to adult health outcomes, studies in this area are largely unable to use the same rigorous statistical methods now common in other types of research on marriage and health. It is also generally more difficult to draw strong causal connections between events occurring decades apart and across generations than between changes in individual behavior occurring in the period immediately following a transition in marital status. To date, the most compelling studies of intergenerational health effects use either long-term longitudinal data or retrospective survey data to relate measures of adult health and longevity to basic measures of childhood family structure, adjusting for other related family characteristics.

PATHWAYS FOR INTERGENERATIONAL HEALTH EFFECTS

How might parental marital status in childhood affect adult health outcomes experienced decades later? One possibility is that marriage makes for healthier children, who in turn make for healthier adults. Research has found that physical health in childhood strongly affects adult health and longevity (see, for example, Blackwell et al. 2001, reviewed later in this chapter). A relationship between parental marital status and childhood health might arise if married parents have more economic resources to provide children with high-quality health care, nutritious foods, and safe and healthy living environments. Marriage might also positively affect parenting practices and the amount of time parents have to tend to sick children or seek information about parenting and children's health. If these patterns exist, we would expect the effects of parental marital status on childhood health to account for at least part of the relationship between parental marital status and adult physical health.

Another possible way in which parental marital status could have long-term effects on physical health is through children's social and emotional development. Research shows that children raised in two-parent families exhibit more positive outcomes in adolescence and adulthood, including increased educational attainment, better mental health and emotional well-being, and fewer health-risk behaviors like cigarette smoking, drug use, and heavy drinking (Amato 2001; McLanahan and Sandefur 1994). Children of married parents also enjoy the benefits of increased family economic resources and are more likely as adults to have their own marriages remain intact. All these outcomes, in turn, have important consequences for adult health and longevity, suggesting another possible long-term pathway by which childhood family structure might affect adult health. If this pathway is important, we would expect adjusting for differences in adult socioeconomic outcomes and health risk behaviors to account for much of an observed relationship between parental marital status and adult physical health.

As we describe below, the results of several recent studies support the hypothesis that the effect of marriage on children's social and emotional development also has important long-term consequences for adult physical health. To date, however, research in this area has focused more on establishing the existence of an effect of parental marital status on adult physical health than on establishing the particular reasons for such an effect.

THE TERMAN LIFE-CYCLE STUDY

Some of the best evidence on intergenerational health effects of marriage comes from the Terman Life-Cycle Study of Children with High Ability. The Terman study is a longitudinal survey that has tracked the lives of a highly select group of more than 1,200 men and women since they were school-age children in California in the early 1920s. Participants were originally chosen for the study after their schoolteachers identified them as very high-achieving students and after having scored at least 135 on a screening IQ test. The socioeconomic and racial/ethnic composition of the study sample is also very homogeneous, as most of the children were raised in middle-class, white families. The unique characteristics of the Terman study sample caution against generalizing results from this study to the broader national population. Even so, we focus on this study because it is the only U.S.-

based study to provide direct evidence on the links between childhood family structure and adult health and longevity based on very long-term longitudinal data for a constant sample of people. Moreover, the homogeneity of the study sample has advantages for distinguishing the effect of parental marital status from the effects of other personal characteristics. For example, if the children are similar in most respects except family structure, then researchers can have more confidence that any differences in adult health and longevity observed later in life are due to differences in family structure rather than differences in other personal or family characteristics. The similarity of the study sample also reduces the need to adjust estimates for a long list of baseline characteristics.

Schultz et al. (1995) use data from the Terman study to examine the relationship between parental divorce in childhood and adult longevity. Parental divorce is measured before age 21, and longevity is assessed from 1930 to 1991. About 13 percent of the study sample experienced a parental divorce before age 21. The study's statistical procedures use event history regression models to relate parental divorce in childhood to the risk of death in each follow-up year, adjusting for differences in gender, age, childhood personality traits, father's occupation, and mother's and father's education levels.

The study does not adjust for differences in childhood health status, because preliminary analyses showed little association among the Terman study sample between longevity and childhood health as measured by low birth weight, parental assessments of their child's health, and histories of surgery or serious injury. This finding runs counter to other research showing a strong effect of childhood health on adult health and longevity (Blackwell et al. 2001) and likely reflects the absence of many serious health problems among this highly select group of children. Without greater variation in childhood health among the study sample, childhood health measures will not relate to measures of adult health and longevity.

Results of the study show that, at any given age, the risk of mortality is about 30 to 40 percent higher among men and women who experienced a parental divorce before age 21 than among those who went through childhood with parents who were in a stable marriage. This finding implies that men and women with married parents can expect to live four years longer, on average, than those whose parents divorce.

In a follow-up study, these researchers extend their analyses of the Terman data by examining possible gender differences in the relationship between childhood family structure and adult longevity (Tucker et al. 1997). They also investigate some of the mechanisms or pathways by which parental divorce in childhood leads to higher adult mortality rates. The study uses measures and statistical procedures similar to those featured in the earlier study by Schultz et al.

Results of the study show that—although these intergenerational health effects exist for both men and women—the effect of parental divorce in childhood is larger for men than women. Explanations of the relationship between parental divorce and longevity also seem to vary by gender. The study finds that men who went through childhood with parents who were in a stable marriage eventually obtained more education, participated as adults in more

social activities, and were less likely to have their own marriages end in divorce, compared with men whose parents divorced. These differences explain much of the gap in longevity between married and unmarried men. For women, however, the study finds that the gap in longevity between those who marry and those who do not owes more to differences in adult health risk behaviors, especially cigarette smoking. The study shows that women who experienced a parental divorce before age 21 were more likely to smoke as adults than those whose parents remained in stable marriages, and that this difference contributes to the gap in longevity between the two groups. These findings suggest that parental marital status in childhood is especially important for boys, and that boys raised in two-parent families enjoy better health as adults because they grow up to experience more positive social and economic outcomes and avoid some of the stress and psychological costs associated with divorce and marital disruption.

RETROSPECTIVE STUDIES

Other recent studies address concerns about generalizing results from the Terman study by examining the relationship between childhood family structure and longevity among the national population. For example, Hayward and Gorman (2004) study the relationship between childhood family structure and longevity using data from the National Longitudinal Survey of Older Men (NLS), a nationally representative survey of approximately 5,000 men. The first wave of the NLS, conducted in 1966 with men ages 45 and older, contained retrospective questions about family life at age 15, including a question about the respondent's family structure in childhood. To estimate the effect of childhood family structure on longevity, Hayward and Gorman relate responses to this question to mortality records covering the period from 1966 to 1990. Their results show that men who reported living with both biological parents at age 15 live longer on average than men who reported living with only one parent or with one biological parent and a stepparent. The study adjusts for differences among men in several other childhood family characteristics, including rural or urban residence, the education level and occupation of the household head, and parents' nativity as measured by whether one or both parents were foreign born. The study cannot adjust for differences in childhood health because the NLS does not include such measures.

The study also finds evidence that the effects of childhood family structure and other family characteristics work primarily through such intervening factors as the child's later educational attainment, economic standing, marital status, and adult health risk behaviors. In particular, the study finds that differences in adult health risk behaviors such as smoking and heavy drinking account for much of the longevity gap between men from families with two biological parents and men from families with other living arrangements. It is possible that these behavioral differences date to adolescence, when patterns of adult health risk behaviors are often set.

A more recent study using the same data shows that these findings apply equally for both African American men and white men (Warner and Hayward 2006). Moreover, the study also finds that the higher percentage of African American men raised in families without two biological parents accounts for at least part of the stark gap in longevity between African American and white men.

OTHER NATIONAL STUDIES

Further evidence on the long-term effects of childhood family structure comes from three additional sources: (1) U.S. Census data; (2) retrospective survey data from the MacArthur Foundation's Survey of Midlife Development in the United States (MIDUS), a national probability telephone survey conducted in 1995; and (3) retrospective data from the longitudinal Health and Retirement Study (HRS).

Preston et al. (1998) use U.S. Census data to study the relationship between childhood family structure and the probability of surviving to age 85 among a cohort of African American men and women born in the late 19th century. The study is based on a unique data set in which death certificates for a sample of people who died in 1985 are linked to childhood demographic data collected in the 1900 and 1910 U.S. Censuses. To locate Census data for the people named on the death certificates, researchers relied on key identifying information reported on the death certificates, including name, mother's and father's names, location of birth, and social security number. Through this procedure, they successfully matched roughly 60 percent of the 1,038 sampled death certificates with the appropriate Census data.

Analyses of these data show that the probability of surviving to age 85 is about 66 percent higher among African-American children raised in two-parent households than among those raised by single parents. The relationship between childhood family structure and longevity persists after adjusting for differences among families in state of residence, rural or urban residence, parents' literacy, and family wealth as measured by owning versus renting a home. The study does not adjust for differences in childhood health because the U.S. Census does not include such data. The study does not examine the effects on longevity of parental marital status separately for men and women.

Maier and Lachman (2000) examine the relationship between parental divorce and adult physical health using data from MIDUS. Participants in the survey ranged in age from 24 to 74, but this study focuses only on participants ages 30 to 60. The survey included a retrospective question about the respondent's family structure at age 17, as well as questions about histories of adult chronic and acute health conditions. The questions about chronic conditions addressed such conditions as tuberculosis, hypertension, and asthma. The questions about acute conditions addressed more short-term problems, such as headaches and trouble sleeping.

The study finds that the relationship between parental divorce in childhood and adult health problems varies by gender. For men, parental divorce before age 17 significantly predicts both chronic and acute health problems in adulthood, with men who experienced a parental divorce reporting more health problems than men whose parents remained in stable marriages. For women, parental divorce significantly predicts more acute health conditions but does not predict chronic health conditions. The finding of a stronger effect of parental divorce for men is consistent with the evidence we reviewed earlier for the study by Tucker et al. (1997) of data from the Terman Life-Cycle study.

Finally, there is little evidence examining the links between parental marital status in childhood and specific adult health conditions like cancer, asthma, or cardiovascular disease. A recent study by Blackwell et al. (2001) of data from the longitudinal HRS suggests that parental divorce in childhood has a less adverse effect on the chances of developing cancer in old age than on the chances of developing other common conditions, including diabetes, chronic lung illness, arthritis/rheumatism, and cardiovascular disease. However, because the study focuses on a relatively small subsample of 654 study participants, it cannot establish the statistical significance of any of these effects. Examining the effect of parental marital status on specific adult health conditions is thus an important area for future research.

SUMMARY OF RESULTS

Overall, the evidence to date suggests that children from two-parent families live longer and enjoy better adult health than children from single-parent families or whose parents divorced in childhood. Research also suggests that such intergenerational health effects are stronger for men than women but operate equally for both African American men and white men.

There is less evidence on the pathways by which childhood family structure affects adult physical health and longevity. Several studies suggest that the effects work mostly through the role of childhood family structure in shaping children's future socioeconomic attainment and adult health risk behaviors such as smoking and heavy drinking. On average, children from two-parent families obtain more education and exhibit healthier adult behaviors than children from other types of families. These differences, in turn, have consequences for adult health and longevity. However, due in part to the relatively limited availability of measures of childhood health in studies of adult health and longevity, studies in this area have largely been unable to test the main alternative explanation—that the relationship between childhood family structure and adult physical health primarily reflects the more immediate effects of family structure on children's physical health.

Moreover, these findings are based on largely cursory evidence from a limited number of studies of retrospective surveys of childhood family structure or long-term longitudinal data from a highly select group of schoolchildren. None of these studies was able to measure childhood family conditions in great detail, and it is difficult to fully distinguish the effect of childhood family structure from effects of closely related characteristics likely family socioeconomic status. For example, it is possible that low socioeconomic status as a child both increases the chances of being raised in a single-parent family and increases the chances of having poor health as an adult. This would result in a correlation between childhood family structure and adult health, even if the two are not causally related.

Finally, except for the study by Maier and Lachman (2000), which focuses on a sample of men and women born in the mid-20th century, the studies reviewed in this section focus largely on trends among people born in the late 19th and early 20th centuries, a period when patterns of marriage, divorce, and single-parenthood were much different than they are today. It is possible that the apparent benefits of marriage for children's health have

weakened as single-parenthood and divorce have become more common and less stigmatizing.

CHAPTER VII

SUMMARY AND FUTURE DIRECTIONS

In this report, we have summarized the most rigorous and up-to-date research evidence on the effects of marriage on health. We have focused specifically on the effects of marriage on four health outcome areas: (1) health behaviors; (2) health care access, use, and costs; (3) mental health; and (4) physical health and longevity. In addition, we have reviewed the research evidence on possible intergenerational effects of marriage—focusing in particular on how parental marital status may affect the physical health of their children when they reach adulthood.

The relationship between marriage and health is complex. Marital status can both affect health outcomes and be affected by them. Studies that do not take into account this complex relationship may yield misleading evidence on the influence of marriage on health. Therefore, in our review, we have focused on evidence based on the most rigorous statistical techniques, which take into account the degree to which healthier people are more likely to get and stay married.

In some areas, the evidence of a positive effect of marriage on specific health outcomes is compelling. In particular, there is strong evidence, based on rigorous research methods, that marriage reduces the prevalence of heavy drinking and marijuana use among young adults. Marriage is also linked to improvements in mental health for both men and women. In addition, marriage increases the likelihood of having health insurance coverage, particularly for women. Recent research suggests that marriage may be associated with lower health care costs among older adults, through its effects on the number of doctor visits, the length of hospital stays, and the likelihood of nursing home admissions. There is also substantial evidence that growing up with married parents leads to better long-term physical health, particularly for men.

For other health outcomes, the evidence is less clear and, in some cases, suggests that marriage has negative health-related effects. In particular, marriage appears to encourage a more sedentary lifestyle and is associated with modest weight gain and reduced physical activity. In addition, although several rigorous studies of the effects of marriage on smoking have been conducted, the evidence is mixed, with studies based on the broadest populations pointing to no effect of marital status on smoking. For specific physical health conditions and illnesses, little rigorous research has been conducted, and, therefore, no clear

conclusions can be drawn. Finally, although many studies have pointed to a pattern of married people living longer than the unmarried, methodological issues make it difficult to confirm that this difference demonstrates a true causal relationship.

In the rest of this chapter, we summarize the research evidence in each of the health outcomes areas we examined in our review. We also highlight certain gaps in the existing literature and suggest appropriate avenues for future research.

EFFECTS ON HEALTH BEHAVIORS

One important way in which marriage may influence a person's health is through its effect on health-related behaviors, such as alcohol consumption, drug use, cigarette smoking, diet, and exercise. Recent research suggests that marriage has significant effects on the health behaviors of both men and women. However, the pattern of these effects is mixed. Marriage is associated with healthier behaviors in some cases and less healthy behaviors in others. The effect of marriage on alcohol consumption has been especially well studied, particularly among young adults. These studies consistently indicate that marriage reduces heavy drinking and overall alcohol consumption and that the effects are similar for young men and young women. Moreover, these effects exist for both African Americans and whites. Although the research is less extensive, marriage is also associated with reduced marijuana use for young men; however, it appears to have smaller effects on women's drug use. Less is known about the effects of marriage on the substance use of older adults. Studies of marriage and smoking reveal no consistent pattern of results and suggest that marriage may have little or no influence on this health behavior.

In contrast to the studies of alcohol and drug use, studies of the effect of marriage on weight and physical activity suggest that marriage may have negative effects on healthy behaviors. Several rigorous studies have examined the effects of marriage on body weight. These studies consistently find that marriage leads to modest weight increases for both men and women—with marriage typically associated with a weight increase of less than five pounds. The research on the effects of marriage on physical activity is less extensive and less conclusive. However, the available evidence suggests that marriage may lead to reductions in physical activity, particularly for men.

For certain health behaviors—in particular, substance use among younger adults and weight gain among all adults—the influence of marriage has been well studied and is well understood. For other health behaviors, less is known and additional research is needed before stronger conclusions can be drawn. One useful area for future research is to examine the effects of marriage on the alcohol use of older adults to determine whether the effects observed for young adults would be found in older populations. Additional research using longitudinal data is also needed to examine the effects of marriage on physical activity to determine whether the relationship between marriage and physical activity observed in cross-sectional analyses remains when more rigorous estimation techniques are used.

EFFECTS ON HEALTH CARE ACCESS, USE, AND COSTS

Marriage may also influence overall physical health through its effects on health care access and use. Studies of the links between marriage and health insurance coverage suggest that—by offering access to insurance through a spouse's insurance policy—marriage increases the likelihood of having health insurance and reduces the likelihood of becoming uninsured after a job loss or other major life event. The effect of marriage on insurance coverage is larger for women than men. Recent research also finds a link between marriage and several aspects of health care use. In particular, these studies show that marriage is associated with shorter average hospital stays, fewer doctor's visits, and reduced risk of nursing home admission. Limited evidence also suggests that marriage is associated with increased use of preventive health services such as cancer screenings.

In part because of these effects on health care use, marriage is also associated with lower health care costs. For example, studies show that, because marriage reduces the risk of nursing home admission, marriage may also lead to reduced costs associated with nursing home care. The effect of marriage on reducing the length of average hospital stays may also lead to reductions in health care costs. This research evidence indicates that the effect of marriage on health care costs exists independent of the effect of marriage on health. Specifically, marriage may lead to reductions in health care costs because married people often rely on their spouses for informal care and, thus, require fewer long hospital stays and nursing home admissions—even if married and unmarried older adults are equally likely to get sick. These studies find that wives are especially likely to provide informal care for their spouses at home, suggesting that this effect on health care costs may be larger for men.

Although studies have examined the effects of marriage on a range of important health care outcomes, many other important outcomes have received little attention in marriage research. In particular, additional research is needed to directly link marriage with health care costs, because most previous research provides only indirect evidence based on an examination of the effect of marriage on high-cost health services, such as nursing home care. Other outcomes ripe for future research include quality of care, use of prescription medications, receipt of high-tech medical exams and treatments, patient adherence to prescribed treatment regimens, and use of preventive health services other than cancer screenings.

EFFECTS ON MENTAL HEALTH

Marriage may affect many aspects of mental health. In our review, we have focused on its influence on one particular aspect—the prevalence of depressive symptoms. The most recent rigorous research suggests that marriage reduces depressive symptoms for both men and women. In particular, these studies find that marital entry decreases depressive symptoms, while marital dissolution increases them. Studies also find that increases in depressive symptoms after divorce are long-lasting and that the prevalence of these symptoms remains elevated years after the marital breakup. In addition, studies that compare the mental health of stably married adults to those who are stably unmarried find that that those who remain stably married have fewer depressive symptoms (and smaller

increases in these symptoms as they grow older) than do similar adults who remain stably unmarried, even after controlling for baseline mental health. Moreover, studies based on national data find little evidence that those with fewer depressive symptoms are more likely to marry, suggesting that studies comparing the depressive symptoms of the stably married to the stably unmarried should produce reasonable estimates of the effect of marriage on depressive symptoms.

Currently available research consistently shows that, for both men and women, being married reduces depression. However, the existing evidence has limitations that future research should address. In particular, much of the research examining the effects of marriage on depressive symptoms using nationally representative data has been conducted using only one data set. Future research should seek to confirm the link between marriage and depressive symptoms by using other national data sets.

In addition, the most rigorous research in this area typically estimates the effect of marriage and marital transitions by comparing the prevalence of depressive symptoms in the period just before a marital transition to the prevalence of such symptoms in the period just after the transition. This method adjusts for background differences between those who marry and those who do not, thus controlling for the selection of those with fewer depressive symptoms into marriage when estimating this effect. However, this technique may introduce other sources of bias into the estimates of the effect of marriage and the direction of this bias is uncertain.

For example, it is possible that the prevalence of depressive symptoms may change in anticipation of an impending marital status change. If so, comparing someone's depressive symptoms during the period just before a marital transition to the period immediately after may underestimate the effect of this transition. Conversely, if depressive symptoms are reduced for only a short time after marriage or are elevated for only a short time after a marital dissolution and then return to their pre-transition levels, then comparisons of depressive symptoms just before and just after the marital transition would overestimate the long-term effect. To address these limitations and to obtain a more precise understanding of the relationship between marriage and depression, longitudinal data sets are needed that offer more detailed mental health histories and more information on changes in mental health status than are available in currently existing national data sets.

EFFECTS ON PHYSICAL HEALTH AND LONGEVITY

Although central to the overall assessment of the link between marriage and health, rigorous research evidence concerning the effect of marriage on specific physical health outcomes is limited, and few solid conclusions can be drawn. It is well established by many research studies that those who marry live longer than those who do not. However methodological issues require caution in interpreting this pattern, because most of the research in this area relies on descriptive methods that do not adequately control for the possible selection of healthier people into marriage. As discussed throughout this report, estimating the effect of marriage by examining the effects of marital transitions is one useful

strategy for addressing selection. However, measures of physical health generally do not lend themselves well to this technique.

The rigorous research that is currently available provides some limited evidence of an effect of marriage on physical health. In particular, recent studies find a significant positive effect of marriage on how men rate their overall physical health status. In addition, researchers find a positive effect for women on physical health as measured by basic counts of specific health conditions and illnesses. However, these studies find no effect of marriage on women's self-ratings of physical health. Moreover, no recent, rigorous studies based on U.S. samples have examined the effect of marriage on counts of health conditions or illnesses among men. Similarly, little evidence exists on the links between marriage and specific health conditions or diseases. One exception is a recent study that suggests a possible link between marriage and the risk of cardiovascular disease for women; however, the study finds no such effect for men. Overall, the existing research evidence on the links between marriage and physical health is limited to a narrow range of health measures and, therefore, does not offer a complete picture of how marriage influences these outcomes.

Many studies have pointed to a strong relationship between marriage and longevity, but this research has several weaknesses. These studies are generally limited to simple descriptive comparisons that do not adequately distinguish the effect of marriage from the possible effects of healthier people selecting into marriage. This limitation of the current research evidence is due in large part to the fact that the methods researchers have developed to separate the influence of selection into marriage from the true protective effects of marriage do not easily transfer to studies that examine the effects of marriage on longevity. In particular, some of the most compelling research on the effects of marriage on other health-related outcomes uses marital transitions to identify the effect of marriage, controlling for background characteristics. However, because longevity is determined only at the end of life, it is not possible to observe how a marital transition changes a person's longevity. Some studies have attempted to address selection using other techniques. Although these studies still find evidence of an effect of marriage on longevity, they all suffer from other limitations that make it difficult to draw firm conclusions from the results. For this reason, the strongest evidence of a positive effect of marriage on longevity comes more from the robustness of this relationship across many studies than from the particular results of any single study.

A more definitive test of the effect of marriage on physical health and longevity will require very long-term longitudinal data that afford the opportunity to control for differences in initial health status measured before sample members begin to marry. With data of this type, researchers can examine how differing marital histories affect physical health, controlling for any initial health differences that may exist between those who marry and remain married and those who do not.

INTERGENERATIONAL EFFECTS

An emerging research literature on the possible intergenerational health effects of marriage suggests that marriage also has potential long-term consequences for the physical

health of a couple's children. In particular, studies show that growing up with married parents is associated with better physical health in adulthood and increased longevity. Research suggests that such intergenerational health effects are especially strong for men and operate equally for both African American and white men. There is less evidence examining possible differences in this relationship for African American and white women.

There are many possible reasons why parental marital status may have long-term health consequences for children. However, the existing research in this area provides fairly limited evidence on the pathways by which childhood family structure affects adult physical health and longevity. Several studies suggest that the effects work mostly through the role of childhood family structure in shaping children's future socioeconomic attainment and adult health risk behaviors (such as smoking and heavy drinking). On average, children raised in two-parent families obtain more education and exhibit healthier adult behaviors than children from other types of families. These differences, in turn, have consequences for adult health and longevity. The relationship between childhood family structure and adult health outcomes may also partly reflect the more immediate impacts of parental marital status on physical health in childhood; however, there is little current research evidence on the long-term effects of childhood family structure operating through effects on childhood physical health.

It is important to note that research in this area has focused largely on trends among people born in the late 19th and early 20th centuries, a period when patterns of marriage, divorce, and single-parenthood were much different than they are today. It is possible that the apparent benefits of marriage for children's health have weakened as single-parenthood and divorce have become more common and less stigmatizing. In addition, much of the research evidence in this area is limited to data for small nonrepresentative samples. Moreover, the nationally representative evidence that is available is based on data sets that began tracking sample members as adults, which limits the ability of these studies to control for differences in the background characteristics of those who grew up in a two-parent family and those who did not.

Future research in this area should focus on (1) replicating the results of existing research with long-term longitudinal data (following sample members from childhood into adulthood) for nationally representative samples, (2) distinguishing more clearly the effect of parental marital status from the effects of other related family characteristics, (3) identifying more precise mechanisms by which childhood family structure might influence adult physical health, and (4) examining whether the relationships observed in earlier generations also apply to a younger cohort of children coming of age in a period when divorce and single-parenthood are increasingly common.

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