

The Emotional Toll of Spousal Morbidity and Mortality

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Objective: Spouse caregivers have an increased risk of mental and physical illness during caregiving and widowhood. The authors sought to evaluate whether partners of an ill spouse have a higher likelihood of developing mental health or substance abuse (MHSA) disorders than partners who have healthy spouses, accounting for both spousal illness and death. **Methods:** The authors used Medicare claims from 1993–2001 for 474,228 married couples. The authors used Cox models to determine the effect of spouse illness on partner MHSA diagnosis, controlling for demographic and clinical characteristics. **Results:** A wife's hospitalization increased the husband's risk of MHSA diagnosis by 1.29 (95% confidence interval [CI]: 1.28–1.29) and his risk of depression by 1.49 (95% CI: 1.48–1.51). A husband's hospitalization increased the risk of a wife's MHSA diagnosis by 1.33 (95% CI: 1.32–1.33) and her risk of depression by 1.41 (95% CI: 1.39–1.42). A wife's death increased the risk of the husband's MHSA diagnosis by 1.12 (95% CI: 1.11–1.13) and increased his risk of depression by 1.49 (95% CI: 1.46–1.51). A husband's death increased the risk of the wife's MHSA diagnosis by 1.14 (95% CI: 1.14–1.15) and increased her risk of depression by 1.41 (95% CI: 1.39–1.42). **Conclusion:** Spouse hospitalizations and spouse death independently increase the risk for partner MHSA and depression diagnoses. These findings can identify which individuals are at greatest risk for emotional distress and should be targeted for interventions to relieve caregiver burden that can arise separately and additively from both spousal illness and death. (*Am J Geriatr Psychiatry* 2007; 15:772–779)

Key Words: caregiving, bereavement, depression, mental health and substance abuse, Medicare

Caregiving for a loved one with advanced or terminal illness is one of life's greatest stressors, and caregivers are at increased risk of mental and physical morbidity and mortality.¹ Spousal caregivers, who are often elderly and have medical

or emotional disorders, may neglect their own health needs to focus attention on care for their partners.^{2,3}

Caregivers may also suffer psychiatric problems as a result of being in a caregiving role.^{4–10} Although

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research has examined the phenomenon of caregiver burden and emotional distress, it remains uncertain whether there are independent effects of serious spousal illness necessitating hospitalization and spousal mortality on partner mental health. That is, prior estimates of the psychological burden of caregiving and of widowhood may have needlessly conflated the two phenomena. Moreover, most studies of caregiver distress suffer from nonrepresentative samples, short time horizons, or inadequate statistical control for confounding. Many studies examine the emotional toll that spousal caregiving for a specific disease can have on the partner in whom we are assessing effects.^{4,5,11–18} Fewer studies aim to compare the emotional toll of alternative spousal diseases, such as cancer, dementia, or Parkinson disease on partners.^{19–22} Studies that compare the independent effects of caregiver burden to bereavement-related distress²³ are rare—most focus either on the caregiver^{8,9,24–27} or the bereaved widow(er).^{28–32}

Using a nationally representative, longitudinal dataset, we examine the impact of spousal hospitalization (a proxy for the onset of serious spousal illness) and spousal death on the use of mental health services by caregiving partners. A key innovation present in this study is that we are able to assess *separately* the effects of spousal illness and spousal death. Prior work has examined how spousal illness and spousal death affect the endpoint of partner death,^{33,34} but intermediate (i.e., nonfatal) endpoints such as partner emotional health have been incompletely addressed in a framework that accounts for spousal illness and spousal death simultaneously. By examining these effects separately, we can determine if there are additive effects of spouse illness and death on partner emotional health, as well as the magnitude of the partner's increased risk of emotional distress as a consequence of spouse morbidity and mortality. We hypothesize that spousal hospitalization and death will have independent and additive effects on partner mental health.

A better understanding of the toll of caregiving is important because the societal burden of caregiver distress is formidable. The national economic value of informal caregiving was almost \$200 billion in 1997,³⁵ and this number should substantially increase in the coming decades. Distressed caregivers may be more likely to place their spouse patient in institutional care settings such as nursing homes,

which are often paid for by public funding sources such as Medicaid.³⁶ Because more than two-thirds of caregivers are employed, the costs of improperly treated distressed caregivers can be substantial.³⁶ Furthermore, emotional disorders in caregivers can extend up to several years beyond the death of the patient.³⁷

METHODS

Data

We used raw Medicare data from married couples where both spouses were alive and age ≥ 66 years on January 1, 1993. We excluded couples who did not live together (i.e., who did not reside in the same zip code). Details on the creation and composition of this dataset are available elsewhere.^{33,34,38,39} A total of 474,228 couples were available for analysis. For each individual, we examined 1 year of prior inpatient and outpatient claims in order to establish a baseline morbidity burden as of January 1, 1993. The baseline period was from January 1, 1992 to December 31, 1992. The follow-up period was from January 1, 1993 through December 31, 2001. Using the Medicare Provider Analysis and Review, outpatient, and so-called "carrier" records for 1993–2002, we obtained dates and diagnoses (using ICD-9-CM codes) for all hospitalizations and doctor visits for each subject.

To create our outcome variable of interest, namely the presence of a mental health or substance abuse (MHSA) diagnosis, we used *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* codes 291–309, 311–312, 315–316 as noted in the Medicare claims data. We took the first date of occurrence of an inpatient or outpatient claim for an MHSA diagnosis as indicative of the occurrence of that diagnosis. We realize that many subjects might have MHSA diagnoses and not seek care, or might have such diagnoses and delay seeking care. But our interest was affirmatively in the conjoined phenomenon of having an MHSA diagnoses and seeing a doctor for it. While the ICD-9-CM codes for all MHSA disorders include codes 290–319,⁴⁰ we excluded MHSA diagnoses related to childhood, postpartum, senility/dementia, brain damage, or mental retardation, because we wanted to focus on

mental disorders relevant to an elderly population and did not want to include dementing illnesses in our definition of emotional distress. We also created a subsidiary outcome variable of interest: the presence of a depression diagnosis. We used ICD-9-CM codes 296.2, 296.3, 298.0, 300.4, 309.1, and 311, based on the coding scheme used by the National Center for Quality Assurance to identify depression⁴¹; all individuals who were depressed were also necessarily coded as having had MHSA.

To summarize baseline morbidity, we used each husband's and each wife's Charlson score from 1992, divided into categories of 0, 1, or 2 or more, with higher scores indicating a greater burden of morbidity.⁴² In addition, we created indicators of baseline mental disorders for both spouses, since the Charlson scores do not account for mental disorders. We used the same ICD-9-CM codes outlined above to determine the presence or absence of a mental health or substance abuse diagnosis during the baseline period.

We also included the following baseline covariates: age for both spouses, date of spouse death (if applicable), an indicator of couple poverty status, black or white race of each spouse, as well as the median household income and the average unemployment rate in each couple's area of residence (defined by ZIP code).

Statistical Analysis

We used Cox models to examine whether partners whose spouses became hospitalized subsequently had an increased hazard of an MHSA diagnosis. To be clear, we examine spouse illness on the basis of spouse hospitalizations—we do not examine spouse outpatient visits and treatment as indicators of spouse illness. However, we examine *partner* MHSA diagnoses using both inpatient and outpatient data. Our reasoning for this choice is that we want the spousal illness to be more than minor, but we are interested in detecting any MHSA in the partner, whether noted on an inpatient or outpatient visit. For this analysis, we followed partners from January 1, 1993 to December 31, 2001 and determined whether they had an MHSA diagnosis or not, and when they did so. We examined all partner MHSA diagnoses, regardless of whether they took place before or after spouse hospitalizations or deaths, but our models

estimate the effect of spousal illness or death on *subsequent* partner events per se. We did not allow for repeated events for partner MHSA diagnosis; therefore, our model estimation for a partner MHSA diagnosis ceased upon the first occurrence of partner MHSA diagnosis. We estimated the hazard of MHSA diagnosis among partners whose spouses had at least one hospitalization during the follow-up period relative to those partners whose spouses had no hospitalizations during the follow-up period. We also independently estimated what effect spouse death had on partner MHSA diagnosis. In other words, these models explicitly estimate the effects of attributes such as spouse hospitalization or death on the outcome of interest, partner MHSA diagnosis, in a fashion that allows separate estimation of the impact of spousal hospitalization or death, as well as of other covariates (such as age, race, etc.). By examining the effects of spouse hospitalization and death separately, we can also account for a situation in which there is no spouse hospitalization but only death (i.e., in the case of sudden death). We treat spouse hospitalization and spouse death as time-varying covariates; all other covariates remain unchanged during the follow up period. To account for any potential bias due to any nonindependence of covariates in the spouse pairs used in our analyses, we calculated corrected p values and degrees of freedom according to the method discussed by Kenny in his report on significance testing in dyadic research.⁴³

RESULTS

Cohort Attributes

Table 1 illustrates the baseline cohort attributes for this study. Among the 474,228 couples, the mean age of wives was 73.6 (5.5) years and the mean age of husbands was 76.0 (5.9) years. During the follow-up period, 7.2% of husbands had depression and 11.6% of wives did. In addition, 39.9% of husbands had an MHSA diagnosis during the follow up period during which 45.8% of wives did. Finally, during the follow-up period, 55.4% of husbands and 35.6% of wives died. Based on Kenny's⁴³ method, the corrected p value needed to determine statistical signif-

TABLE 1. Baseline Characteristics of Couples (N = 474,228)

Variable	Mean or N	SD or %
Husbands		
Age	76.01	5.88
Previous mental disorder (1992)	217,262	4.58%
Current depression (1993–2001)	34,181	7.21%
Current mental disorder (1993–2001)	189,066	39.87%
Charlson score		
0	287,755	60.68%
1	83,660	17.64%
2+	102,813	21.68%
Race		
Black	19,762	4.17%
Other	26,300	5.54%
White	482,166	90.29%
Hospitalization (during 1993–2001)	354,615	74.78%
Death (during 1993–2001)	262,799	55.42%
Wives		
Age	73.57	5.49
Previous mental disorder (1992)	26,297	5.55%
Current depression (1993–2001)	54,999	11.60%
Current mental disorder (1993–2001)	216,977	45.75%
Charlson score		
0	326,842	68.92%
1	79,050	16.67%
2+	68,336	14.41%
Race		
Black	19,934	4.20%
Other	16,884	3.60%
White	437,210	92.19%
Hospitalization (during 1993–2001)	322,655	68.04%
Death (during 1993–2001)	168,882	35.61%
Couple		
Below poverty line	17,423	3.64%
Median household income (1993)	\$32,302	\$7,715
Unemployment rate (1992)	7.58%	2.59%

ificance in our sample was $p < 0.10$ rather than 0.05, with the degrees of freedom equal to 394,364.79.

Mental Health After Hospitalization of a Spouse

Table 2 provides estimates of the effect of spousal hospitalization on partner risk of MHSA diagnosis after adjusting for whether the spouse dies and after adjusting for other measured attributes of both parties, including their age and baseline morbidity. We found that a wife's hospitalization increased the husband's subsequent risk of an MHSA diagnosis by 1.29 (Wald $\chi^2 = 2,223.94$, $df = 1$, $p < 0.001$, 95% CI: 1.28–1.29) and his risk of depression by 1.49 (Wald $\chi^2 = 1,065.12$, $df = 1$, $p < 0.001$, 95% CI: 1.48–1.51). A husband's hospitalization increased the risk of a wife's MHSA diagnosis by 1.33 (Wald $\chi^2 = 3,106.07$, $df = 1$, $p < 0.001$, 95% CI: 1.32–1.33) and her risk of depression by 1.41 (Wald $\chi^2 = 1,174.21$, $df = 1$, $p < 0.001$, 95% CI: 1.39–1.42).

These results also confirm that spouse death increased risk of partner MHSA diagnosis net of prior illness in this decedent spouse. The death of a wife increased the risk of the husband's MHSA diagnosis by 1.12 (Wald $\chi^2 = 229.18$, $df = 1$, $p < 0.001$, 95% CI: 1.11–1.13), and increased his risk of depression by 1.49 (Wald $\chi^2 = 763.57$, $df = 1$, $p < 0.001$, 95% CI: 1.46–1.51). The death of a husband increased the risk of the wife's MHSA diagnosis by 1.14 (Wald $\chi^2 = 487.61$, $df = 1$, $p < 0.001$, 95% CI: 1.13–1.15), and increased her risk of depression by 1.41 (Wald $\chi^2 = 1,121.23$, $df = 1$, $p < 0.001$, 95% CI: 1.39–1.42). The risk of MHSA or depression diagnosis after death of a spouse is independent and separate from their risk of these outcomes after the spouse's hospitalization. Therefore, we can say for example that if the wife's hospitalization increased the husband's risk of an MHSA diagnosis by 1.29 and her death increased his risk of MHSA by 1.12, these effects are additive, and moreover, that the wife's hospitalization explains more than twice as much risk of MHSA in the husband as the wife's death. In addition, the presence of a partner mental disorder during the baseline period, race, and couples' poverty status were also significant predictors of partner MHSA and depression diagnoses.

DISCUSSION

The findings from our study offer several advances beyond prior research. We had a very large, nationally representative, longitudinal dataset of Medicare claims for both partners in married pairs. We also consistently tracked all spouse hospitalizations (a marker of spouse illness) and partner MHSA diagnoses (using both hospitalizations and outpatient claims) using ICD-9-CM codes for the entire study period, along with any dates of death for both spouses. Furthermore, we were able to separately detect the distinct effects of spousal illness and spouse death on partner mental health.

Research on emotional distress associated with caregiving for an ill spouse or bereavement after spousal death may overlook the independent effects of these two phenomena. Partners can suffer distinct emotional consequences when their spouse is hospitalized and when their spouse dies. We found that

TABLE 2. Risk of Depression or Mental Disorder in a Partner After the Hospitalization or Death of a Spouse, Controlling for Other Individual and Couple Characteristics

Variable	Partner Hazard of Depression				Partner Hazard of MHSA			
	Male Partner ^a		Female Partner ^b		Male Partner ^c		Female Partner ^d	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Spouse hospitalization	1.49	1.48, 1.51	1.41	1.39, 1.42	1.29	1.28, 1.29	1.33	1.32, 1.33
Spouse death	1.49	1.46, 1.51	1.41	1.39, 1.42	1.12	1.11, 1.31	1.14	1.14, 1.15
Husbands								
Age	1.00	1.00, 1.00	1.00	1.00, 1.00	1.00	1.00, 1.00	1.00	1.00, 1.00
Previous mental disorder (1992)	1.76	1.73, 1.80	1.21	1.12, 1.23	2.18	2.16, 2.20	1.21	1.20, 1.23
Charlson score (ref = 0)								
1	1.29	1.28, 1.31	1.10	1.09, 1.11	1.29	1.28, 1.30	1.13	1.12, 1.14
2+	1.25	1.23, 1.27	1.09	1.08, 1.11	1.20	1.19, 1.20	1.13	1.12, 1.14
Race (ref = other)								
Black	0.98	0.88, 1.08	0.93	0.86, 1.00	1.13	1.09, 1.17	1.00	0.96, 1.03
White	1.26	1.22, 1.30	1.20	1.17, 1.23	1.20	1.19, 1.22	1.11	1.10, 1.12
Wives								
Age	1.00	1.00, 1.00	1.00	1.00, 1.00	1.00	1.00, 1.00	1.00	1.00, 1.00
Previous mental disorder (1992)	1.20	1.18, 1.23	1.96	1.94, 1.99	1.22	1.21, 1.23	2.46	2.44, 2.48
Charlson score (ref = 0)								
1	1.07	1.05, 1.08	1.36	1.35, 1.38	1.11	1.11, 1.12	1.34	1.33, 1.35
2+	1.10	1.08, 1.12	1.28	1.27, 1.30	1.14	1.13, 1.15	1.23	1.22, 1.24
Race (ref = other)								
Black	0.79	0.78, 0.88	0.95	0.87, 1.02	1.03	0.99, 1.07	1.12	1.08, 1.16
White	1.13	1.08, 1.17	1.17	1.14, 1.21	1.07	1.05, 1.09	1.16	1.14, 1.18
Couple								
Below poverty line	1.16	1.12, 1.19	1.20	1.17, 1.22	1.33	1.32, 1.35	1.29	1.27, 1.30
Median household income (1993)	0.98	0.98, 0.98	0.98	0.98, 0.98	0.99	0.99, 0.99	0.99	0.99, 0.99
Percent unemployment rate (1992)	0.97	0.96, 0.97	0.97	0.97, 0.97	0.98	0.98, 0.99	0.99	0.99, 0.99

^aWald $\chi^2 = 6300.88$, $p < 0.001$, $df = 17$.

^bWald $\chi^2 = 11163.66$, $p < 0.001$, $df = 17$.

^cWald $\chi^2 = 25468.02$, $p < 0.001$, $df = 17$.

^dWald $\chi^2 = 38723.60$, $p < 0.001$, $df = 17$.

both spousal hospitalization and death are associated with and increased risk of partner MHSA and depression diagnosis, and that spouse death may carry an added risk for partner MHSA and depression diagnosis on top of the increased risk associated with spouse hospitalization. These findings suggest that prior research on caregiving and bereavement may have overestimated the mental health consequences of the death of a spouse by including only one variable that accounts for both premortal spouse illness and also spouse death without estimating the distinct effects of these two phenomena. While our models examined the additive nature of spousal hospitalization and death on partner mental health, these effects may also be multiplicative, which would indicate that partners with the poorest emotional health had a spouse who was ill and subsequently died.

Our findings also demonstrate the significant impact of prior partner mental illness, poverty, and race

on partner mental illness. None of these findings is surprising, as prior mental illness is a strong predictor of current mental illness, and people who are in poverty or are not white are less likely to access mental health services.⁴⁴ We cannot determine from our data if people who are poor or nonwhite are actually less mentally ill, or if they are less able to access services, as our data can only detect use of services, not need for them. In fact, our analyses are likely an underestimate of the burden of emotional disorders in this population, as older caregivers or widowers may be reluctant to seek treatment for emotional distress,⁴⁵ and older adults tend to emphasize somatic rather than psychological complaints which may not be diagnosed as mental health concerns by their primary care physicians.⁴⁶

Several explanations or mechanisms have been advanced for the relationship between spouse illness or death and partner mental health. One theory focuses on stress—that spousal illness or death could be very

emotionally stressful for partners.⁴⁷⁻⁴⁹ Another theory suggests that spousal illness or death might deprive a partner of social, emotional, or economic support.^{14,50-52} Spouses are connected by a social tie (marriage) and when this marriage changes during illness or ends due to death, the emotional impact on the partner can be devastating. This is particularly true in elderly couples, where the surviving partner may have had mental and physical disorders as well.

Confounding is an important potential limitation of observational studies. In the present case, the two spouses might share unobserved traits that affect the health outcomes of both. For example, our study controlled for several demographic and clinical attributes, but we could not capture events like the death of a child during the follow up period that might reveal both spousal illness and also partner MHSA diagnoses. In addition, the association between partner MHSA and spousal hospitalization and death could potentially operate in both directions, that is spousal hospitalization or death could contribute to partner MHSA and partner MHSA could contribute to spousal hospitalization or death. We use temporal ordering to model the extent to which spousal hospitalization, measured in a time-varying way, predicts partner MHSA, and we censor our observations at the time of partner death, partner MHSA, or the end of the study period. We acknowledge that our study period is quite long (up to nine years of follow-up) and that a partner MHSA or depression diagnosis several years after a spouse event may or may not be related to the spouse's event. Future research should more closely examine specific time periods postspouse event in which partners face the greatest risk of emotional distress. Our findings, however, indicate that there is an increased risk of partner MHSA and depression diagnosis among partners who experience either spouse hospitalization or spouse death (or both) during this follow-up period.

We are also constrained by using claims data to detect MHSA diagnoses. If a partner was struggling with an emotional disorder but did not receive any treatment for it, we will not be able to detect this with our analyses. This is particularly important because undiagnosed disorders may be as prevalent or more in this population of spouses of men or women who are hospitalized or who die, especially if partners who are caregiving neglect their own health-related

needs. Although we may be missing some people who have MHSA disorders but do not seek treatment, any findings we have would be biased toward the null. In other words, the measured impact of spouse hospitalization or death on partner MHSA service use found in this study perhaps underestimates the impact of spouse hospitalization or death on the actual presence of partner MHSA disorder. In addition, our exclusion of dementia/senility from our definition of MHSA also biases the findings toward the null hypothesis, if one considers that bereavement or caregiver-associated depression might hasten the onset (or uncover the presence of) dementia. Furthermore, help-seeking behaviors may vary between genders (husbands and wives), and our independent models of the impact of spouse hospitalization and death on partner mental health do not allow us to make comparisons across gender. Finally, we also are constrained by using spouse hospitalization as a proxy indicator of spouse illness, however, there will be some cases in which spouses are ill (potentially seriously ill) without being hospitalized, which we cannot detect using claims data.

This research adds support to earlier finding indicating that illness and death in individuals can affect the emotional health of other people in their social network.^{33,53,54} Conversely, research also indicates that treatment for an ill patient can positively influence the mental health of spouse caregivers.^{13,55-59} It is both important to recognize that mental health treatment could benefit not only the ill person, but others in his or her social network.⁵³ In addition, interventions should target which patients have diseases that might be most distressing for close friends and family members. This way, we can provide assistance or treatment to the caregivers, to prevent those people from becoming the next set of patients, or from becoming "hidden patients."^{60,61} Government and insurance agencies also might be interested in the potential greater cost-effectiveness and efficiency of medical care and mental health care. Recognizing the variable emotional toll of different spouse diseases, the effects of spousal disease compared to spousal death, and the relative burdens for husbands versus wives can lead to informed and targeted interventions for patients and their families, benefiting families and society as well.

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Spousal Morbidity and Mortality

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