Gender Disparities in Adult Health: An Examination of Three Measures of Morbidity*

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Recent examinations of gender differences in physical health suggest that women's disadvantage may be smaller than previously assumed, varying by health status measure and age. Using data from the 1997–2001 National Health Interview Surveys, we examine gender-by-age differences in life-threatening medical conditions, functional limitations, and self-rated health and consider whether potential mediating mechanisms (e.g., socioeconomic status, behavioral factors) operate uniformly across health measures. The results show that the gender gap is smallest for life-threatening medical conditions and that men do increasingly worse with age. For self-rated health, men are more likely to report excellent health at younger ages, but with increasing age this gap closes. Only for functional limitations do we find a consistent pattern of female disadvantage: Women report more functional limitations than men, and the gap increases with age. The ability of explanatory mechanisms to account for these patterns varies by the health measure examined.

It is an accepted fact that women live longer than men. In 2001, life expectancy at birth in the United States was 5.5 years longer for women than for men—79.8 years versus 74.3 years, respectively (Arias 2004). The relationship between gender and morbidity is more complex, with women experiencing poorer health than men on a variety of outcomes (Rieker and Bird 2000; Verbrugge 1985). Recent examinations of this paradox suggest that gender differences in health may be smaller than previously assumed, varying by health status measure and age (Arber and Cooper 1999, 2000; Hunt 2002; Macintyre, Hunt, and Sweeting 1996). Nevertheless, the picture of near-constant female excess in morbidity persists in the general literature, in part because few studies examine gender differences across health measures by age.

Accordingly, this paper extends prior research to examine gender differences in physical health across three measures of health status at different ages of adulthood. Using data from the 1997 through 2001 waves of the *National Health Interview Survey*, we provide a systematic assessment of gender differences in life-threatening medical conditions, functional limitations, and self-rated health, giving specific attention to the size and significance of the gender gap at different ages of adulthood. We also investigate whether the mechanisms that contribute to gender differences in health, such as socioeconomic status, vary by health measure.

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GENDER AND THE MORBIDITY PARADOX

Women report worse health than men despite the fact that they live longer (Verbrugge 1985), a phenomenon known as the "morbidity paradox." Some portion of the female disadvantage in health status is driven by the fact that the female population in the United States is older than the male population, and research has shown that the longer life span of women is a direct cause of their poorer health at older ages (Crimmins, Kim, and Hagedorn 2002; Crimmins, Hayward, and Saito 1996). However, gender differences in health reflect more than variations in the age structure of the male and female populations. Medical sociologists have long argued that biomedical research, which focuses on physiological differences between men and women, ignores the manner in which gender as a social construct affects the physical health of men and women. Mounting evidence indicates that gendered inequities in health are just one consequence of a stratification system that differentially allots opportunities to men and women in a way that affects their quality of life (Denton, Prus, and Walters 2004; Ross and Bird 1994). Men and women occupy different social-structural locations that mediate their exposure to risks that are harmful to health, their participation in health-damaging behaviors, and their access to goods and resources that promote well-being (Bird and Rieker 1999).

Socioeconomic status (SES) is a key mechanism through which these goods and resources are distributed (Denton and Walters 1999; Ross and Bird 1994). In general, persons of lower SES report worse health, in part because they are exposed to more hardship and stress and have limited access to resources that can be used to prevent and cure disease (Ross and Bird 1994; Walters, McDonough, and Strohschein 2002). Women are more likely than men to work part time, participate in unwaged labor, and receive lower wages, all of which drives down their chances for good health (e.g., Ross and Bird 1994). Slightly more women than men graduate from high school and college, but women are more likely to be poor (Bianchi and Spain 1996) and are more likely to report that financial costs are a barrier to receiving medical care (Nelson et al. 1999). Once socioeconomic inequalities are considered, gender disparities in health are often substantially reduced (e.g., Bird and Fremont 1991).

Differential participation in health-damaging behaviors is also important. The health risks incurred by smoking (U.S. Department of Health and Human Services 2000) and being overweight or obese (Calle et al. 1999) are well documented, while exercise (Tanasescu et al. 2002) and moderate drinking (Ellison 2002) are positively associated with health. Men are more likely to smoke than women, although this difference is essentially nonexistent at the youngest ages (Barbeau, Krieger, and Soobader 2004; Wallace et al. 2003). Men also drink more, and more often, than women (Johnson et al. 1998; York, Welte, and Hirsch 2003), and they are more likely to be overweight (Galuska et al. 1996; Verbrugge 1989). However, men are healthier in terms of exercise, as they more frequently engage in physical activities such as walking and strenuous exercise (Ross and Bird 1994; Trost et al. 2002).

Psychosocial factors are additional mechanisms by which gendered social conditions disadvantage women's health. Women are more likely than men to experience stressful life events and chronic stressors in everyday life (which are linked to SES) that in turn increase their likelihood of depression. Depression is directly linked with poorer health through decreased immune functioning and heightened blood pressure; depression is indirectly linked to poorer health through increased participation in unhealthy behaviors such as excessive drinking, lack of exercise, and smoking (for a review see Ross and Bird 1994); and research has demonstrated that women have higher rates of depressive disorders than men (Mirowsky and Ross 1992; Rieker and Bird 2000).

Finally, it is important to consider other comorbid conditions, as men and women differ in the number and types of diseases they have to deal with. For example, gender differences in disability rates may help explain gender differences in self-rated health, although the manner in which disability relates to self-assessment of overall health appears to vary between men and women (Arber and Cooper 1999; Marks 1996).

GENDER DISPARITIES BY HEALTH MEASURE AND AGE

Recent critiques of the morbidity paradox involve two assessments (Allandale and Hunt 2000; Hunt 2002). The first criticism is that past studies focus on explaining the paradox without empirically establishing gender differences in a range of health outcomes. Examinations across health measures suggest that gender differences in morbidity may be more modest than previously assumed (Lahelma and Rahkonen 1997; Macintyre et al. 1996). Further, much work has been limited to bivariate associations between gender and health and has failed to explore whether potential explanatory mechanisms (e.g., socioeconomic status) vary by health status measure (e.g., Clark, Stump, and Wolinsky 1997; Wingard et al. 1989). As a result, there are important gaps not only in our understanding of the uniformity of gender disparities but also in our understanding of the relative importance of mediating influences across health status measures.

The second criticism addresses the lack of attention given to age. As noted by Arber and Cooper (2000): "Age and gender differences in health are likely to reflect the socially constructed nature of gender roles and expectations regarding chronological age. We may therefore expect the nature of inequalities in health for men and women to vary for different age groups" (p. 123). It is surprising that age is often glossed over, because we have known for some time that age is central to our understanding of gender differences in health (Verbrugge 1985, 1986).

Life-Threatening Medical Conditions

The number of chronic health conditions that men and women experience increases with age, but men and women differ substantially in the type of problems they develop (Guralnik et al. 1989). Men suffer from more life-threatening conditions (e.g., heart disease, emphysema) that develop with age and shorten their life expectancy, while women suffer from more nonfatal chronic conditions, such as arthritis (Verbrugge 1985). Thus, the male health advantage is larger in early life but shrinks with age as the life-threatening medical conditions that plague them begin to emerge in force.

Earlier work attributed the higher rate of life-threatening medical conditions among men to differences in health behaviors, which include more smoking and alcohol consumption (Verbrugge 1985). Since then, others have documented gender differences in a variety of chronic medical conditions, including cancer, heart disease, and hypertension (Crimmins et al. 2002; Macintyre et al. 1996; Wingard et al. 1989), although none of these explored the role that gender disparities in health behaviors (or in any other explanatory factor) played in explaining the gender disparity.

Functional Limitations

Disability is another important component of health. Regardless of measurement, research has been quite consistent in documenting the higher rate of disability among women (Lubitz et al. 2003; Merrill et al. 1997; Newman and Branch 2001). In this article we examine gender differences in the number of reported functional limitations. Studies have clearly shown an elevated rate of functional limitations among older women (Marks 1996; Merrill et al. 1997), and even among the elderly the size of the gender gap rises with age. Newman and Brach (2001) report that the gender gap in functional limitations rises with age, climbing to a 15-point differential among persons ages 85 and older, where 65.6 percent of women report at least one functional limitation, compared to 50.0 percent of men. Studies that include younger adults also demonstrate an elevated rate of functional limitations among women (Wingard et al. 1989; Verbrugge 1985).

Past studies, though informative, have failed to investigate why physical functioning varies for men and women at different ages. One plausible explanation that has not received recent empirical scrutiny is that women's higher rate of physical health problems (i.e., comorbidity) contributes to this difference (Verbrugge 1985). Gender differences in depression might also be important, as more women than men report depression as a cause of disability (Ettinger et al. 1994). This factor may be quite important in explaining the higher rate of functional limitations among women than men at younger ages. Differential report-

ing of functional problems by men and women has also been suggested, but research has shown that self-reports of functional limitations are accurate for both men and women (Merrill et al. 1997).

Self-Rated Health

Self-rated health differs from the previous measures in that self-perceptions of overall health are more broad and inclusive than specific measures of health or impairment (Idler and Benyamini 1997). While nonspecific with regard to the actual ailment, global self-assessments capture something about an individual's health status that extends beyond more objective measures of health (e.g., the presence of a life-threatening health condition, such as heart disease).

Verbrugge (1985) documented better self-rated health among men, with the size of the advantage smaller among persons ages 65 and older. More recently, Ross and Bird (1994) found that younger women report significantly worse health than men in the United States, but that the gap closes with age, and Marks (1996) showed that women at age 53 had better self-reported health than men the same age. Data from Britain reveal a similar pattern. Macintyre et al. (1996) found significant differences in self-rated health only among 18-year-olds, with no differences among older age cohorts, and Arber and Cooper (1999) found almost no difference in self-rated health among persons ages 60 and older. In explaining these patterns, Bird and colleagues have pointed to the importance of SES in shaping differences in men's and women's self-rated health (Bird and Fremont 1991; Ross and Bird 1994). Specifically, controlling for women's disadvantaged employment status and wages results in men reporting significantly worse health than women, and adjustment for the greater time women spend doing housework and helping others further explains why women report worse health.

Hypotheses

Taken together, these literatures allow us to posit three hypotheses regarding the relationships among gender, age, and adult physical health:

Hypothesis 1: The odds of experiencing a life-threatening medical condition will increase with age for both men and women, but at a faster pace for men.

Hypothesis 2: Women will report a greater number of functional limitations than men at every age, and the size of this gap will increase with age.

Hypothesis 3: Women will report worse self-rated health than men in early adulthood, but the gap will shrink with age.

Further, prior studies suggest that socioeconomic status will be more useful than other mechanisms for explaining the above patterns, particularly for gender differences in self-rated health.

DATA AND METHODS

Data

Data for this study are drawn from the 1997 through 2001 waves of the National Health Interview Survey (NHIS), an annual multipurpose health survey conducted by the National Center for Health Statistics and the Centers for Disease Control and Prevention and administered by the U.S. Census Bureau. NHIS uses a multistage, stratified, cluster design, and it includes an oversample of black and Hispanic populations. When weighted, the data are nationally representative of the noninstitutionalized civilian population in the United States.

For each family in the NHIS, one sample adult was randomly selected and included in the sample adult core. These respondents are queried on a detailed set of questions regarding health status, health care services, and behavior. We merged the 1997–2001 waves of the sample adult files, yielding a sample of 151,736 respondents who had nonmissing information on included covariates (excluding dependent measures).

Dependent Measures

The NHIS collects detailed information on respondents' health status, allowing us to examine three facets of health. First, we include a measure of life-threatening medical conditions. Respondents in the NHIS were

asked a series of yes/no questions about whether they had ever been told by a doctor or other health professional that they had hypertension, heart disease (coronary heart disease, angina pectoris, or any other heart condition or disease), stroke, emphysema, diabetes, or cancer (excluding skin cancer). Based on responses to these questions, we created a summed index of the number of life-threatening medical conditions the respondent has had, setting the maximum at three (range: 0, 1, 2, or 3+ conditions). Second, we examine one measure of physical disability: functional limitation. Respondents were asked about the amount of difficultly they experienced performing 12 different tasks (walking a quarter of a mile, walking up 10 steps without resting, standing for two hours, sitting for two hours, stooping/bending/kneeling, reaching up over their head, using fingers to grasp or handle small objects, carrying 10 pounds, pushing or pulling large objects such as a living room chair, going out shopping and to other events, participating in social activities, and relaxing at home for leisure). We combine responses to these items and examine the number of reported limitations, setting the maximum at 10 (range: 0 to 10+; Cronbach's alpha = .93). Third, we examine self-rated health, which asked respondents to rate their health in general on a five-point scale (1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent).

Independent Measures

Our primary predictor variables are gender (1 = female, 0 = male), age at interview (range: 18 years to 85+), and the interaction between gender and age. In the regression models, we sequentially introduce different sets of control measures in a model-building sequence designed to examine whether any observed gender-by-age difference in health can be attributed to measures associated with gender stratification in the United States. First, we include four demographic characteristics. Racial/ethnic group membership (non-Latino white, non-Latino black, non-Latino Chinese, non-Latino Filipino, Puerto Rican, Mexican, Cuban, and all other) is included, because the mechanisms that help explain gender differences in morbidity differ for minority groups (Cooper 2002; Read and Gorman 2006). We control for duration of residence in the United States because more recent immigrant arrivals are typically healthier than longer-duration immigrants and native-born persons (Cho and Hummer 2001). We also include a continuous measure of family size and a categorical measure of marital status at interview (married, cohabiting, widowed, divorced/separated, and never married), as men benefit more from marriage than women (Lillard and Waite 1995).

We assess the impact of socioeconomic status with four different measures. We include a continuous measure of the highest level of school completed (range: 0 [never attended school] to 21 [doctoral degree]). Second, we add a measure of the family's income-to-poverty ratio, which represents each respondent's family income as a proportion of the income level that the U.S. federal government has set as the poverty line. Due to the high level of nonresponse (20%), missing values are set to the mean value, and a dummy measure representing missing cases is included as a control. Third, we include a dummy measure of whether the respondent was working last week (1 = employed, 0 = unemployed). Fourth, we constructed a dummy measure of whether the respondent reported any financial barriers to medical care during the last year (1 = yes, 0 = no). This measure was created from three questions that asked whether, during the last 12 months, the respondent had delayed medical care, did not receive medical care, or did not receive prescribed medications because he or she could not afford it (Cronbach's alpha = .73).

Lifestyle and behavior characteristics are captured with four measures. We include smoking status as a categorical measure, contrasting those who have never smoked (1; reference) with current (2) and former (3) cigarette smokers. Our measure of drinking combines information about whether the respondents currently drink, and, if so, how much alcohol they consume per occasion: 1 = lifetime abstainers (reference), and 2 = former drinkers. Current drinkers are grouped by amount consumed per occasion: 3 = 1–2 drinks, 4 = 3–4 drinks, and 5 = 5+ drinks. We also control for the frequency of muscle-strengthening exercise (1 [never] to 5 [5+ times per week]) and body mass index (BMI).

Finally, we include a measure of short-term depressive mood, which is constructed by averaging responses to six questions that asked how often during the last 30 days the respon-

dent felt sad, hopeless, restless, nervous, worthless, and that everything was an effort (Cronbach's alpha = .86). Responses ranged from 1 (none of the time) to 5 (all of the time).

In analyses not shown, weighted means and percentages for each independent predictor were calculated for the full sample and by gender. The average age of women in our sample is 1.5 years older than that for men (45.5 years vs. 44.0 years); this difference is expected, given the longer life expectancy of women. In terms of socioeconomic and demographic characteristics, women are disadvantaged relative to men in several respects. Women report more poverty, and a higher proportion of women experienced financial barriers to medical care in the last year. More women are widowed, divorced or separated, and fewer women than men are currently married (56.4% vs. 61.8%, respectively).

In their favor, women tend to report less behavior that can be damaging to health. While 59.5 percent of women have never smoked a cigarette, only 47.0 percent of men have never smoked. Women report only slightly higher rates of moderate drinking (1–2 drinks per occasion) than men, and they report much lower rates of binge drinking (3.0% for women vs. 10.9% for men). Although women report a lower BMI, they engage in muscle-strengthening exercise less often than men.

Analysis

Due to the complex sampling strategy employed to collect the NHIS data, models are estimated using the Huber/White estimator of variance in Stata. Rather than assuming that observations are independent, Stata corrects for the intracluster correlation that occurs because of the complex sample design, producing standard errors that are more accurate and reducing the chance of Type I errors. Weights are also used in all analyses due to oversampling of blacks and Hispanics.

RESULTS

Descriptive Statistics

Table 1 presents weighted means for each dependent measure. If we ignore age and look only at the aggregate pattern, women are significantly disadvantaged relative to men for each health measure. Women report a significantly higher number of life-threatening medical conditions, though the size of this difference is rather small (.48 among women compared to .44 for men). The gender gap is much larger for functional limitations, with women reporting 57 percent more limitations than men (1.49 vs. .95, respectively). Women also report significantly worse health, but the difference, while significant, is small: The mean value is 3.78 for women and 3.89 for men.

If we examine these rates by gender and age category, a different picture emerges. For life-threatening medical conditions, women's disadvantage exists only among the younger age groups; among persons ages 45 to 59, men and women do not differ significantly in their number of medical conditions, and among persons ages 60 and older, men report significantly more medical conditions than women. However, as seen for the overall scores, the size of the difference between men and women is modest. For functional limitations, the female disadvantage holds across all age groups and increases in severity with age: Among persons ages 75 and older, women report an average of 4.07 functional limitations, compared to 2.90 among men. The pattern for self-rated health differs from the patterns for the other two health measures. Here, women report significantly worse health between the ages of 18 and 74; at ages 75 and above, men and women do not differ significantly in their self-rated health status. Again, the sizes of these differences are small.

Multivariate Models of Physical Health

We present a series of ordinary least squares regression models predicting the number of life-threatening medical conditions and the number of functional limitations in Tables 2 and 3, and we present ordered logit models predicting self-rated health status in Table 4. Each table follows the same model-building sequence, designed to examine the interaction between gender and age (model 1) and the ability of the following groups of measures to account for the relationship between the gender-age interaction and health: concomitants and demographic characteristics (model 2), socioeconomic status (model 3), health behaviors (model 4), depression (model 5), and other

TABLE 1. Weighted Means for Dependent Variables, by Gender and Age

	Full Sample	Women	Men
Number of life-threatening medical conditions			
(N = 151,717)	.46	.48	.44***
18–29 years old	.11	.12	.09***
30–44 years old	.22	.24	.21***
45–59 years old	.54	.54	.53
60–74 years old	1.01	.98	1.04***
75 years and older	1.26	1.24	1.28*
Number of functional limitations			
(N = 151,684)	1.23	1.49	.95***
18–29 years old	.38	.48	.28***
30–44 years old	.71	.85	.57***
45–59 years old	1.41	1.69	1.11***
60–74 years old	2.23	2.57	1.85***
75 years and older	3.61	4.07	2.90***
Self-rated health score			
(N = 151,651)	3.83	3.78	3.89***
18–29 years old	4.18	4.12	4.23***
30–44 years old	4.03	4.01	4.06***
45–59 years old	3.72	3.68	3.77***
60–74 years old	3.37	3.35	3.40**
75 years and older	3.12	3.11	3.14

* $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed t-test)

Note: Significance tests indicate whether or not the percentage for men is significantly different from that for women.

health conditions (model 6).[1] As the interpretation of interaction terms in tabular form is often complicated, we illustrate the relationship between the gender-age interaction and each health outcome by calculating predicted values for each dependent measure based on the final model (see Figures 1–3).

Looking first at Table 2, we see that the interaction between gender and age is not significant in model 1. The number of life-threatening medical conditions increases steadily for both groups, with men and women averaging about 1.3 life-threatening medical conditions by the age of 85 (calculations not shown due to space limitations). Model 2 adds demographic characteristics, and a significant interaction between gender and age emerges: With increasing age, women report significantly fewer life-threatening medical conditions than men. Ancillary analyses reveal that marital status is operating as a suppressor variable between the gender-age interaction and the dependent measure. Thus, hypothesis 1 is supported once we adjust for marital status. The remaining explanatory measures (see models 2–5) have a significant effect on the likelihood of reporting a medical condition, but their impact on the gender-by-age interaction is negligible. Socioeconomic status appears to have the largest impact on reducing the size of the gender effect, and depression also results in a substantial reduction, while adjusting for health behaviors increases its size.

Looking at Figure 1, we see that if the scenario in model 5 (where men and women are equivalent in terms of SES, health behaviors, rates of depression, and demographic characteristics) were achieved, at the younger adult ages there would be almost no difference between men and women in terms of reporting a medical condition. Indeed, the predicted values for both men and women would be essentially zero, a reasonable prediction given the very low rates of these conditions among young adults. However, as people age, the predicted values for both men and women would increase, and the increase would be more steep for men. It is important to note that the size of the gender difference would still be small, even at the oldest ages: The predicted value for women ages 85 and older is 1.15, compared to 1.25 for men.

In Table 3 we present coefficients from regression models predicting the number of functional limitations. In support of hypothesis 2, our baseline model (model 1) indicates that while there is no gender difference in functional limitations at the youngest ages (calculations not shown), the values for men and women rise with age, with a significantly steeper increase for women.

Models 2 through 5 test the efficacy of demographic, socioeconomic, behavioral, and

TABLE 2. Unstandardized Coefficients from OLS Regression Models: Number of Life-Threatening Medical Conditions

	Model 1	Model 2	Model 3	Model 4	Model 5
Female	.075	.109*	.066*	.079*	.066*
Age	.022*	.023*	.020*	.018*	.019*
Female × age	−.001	−.002*	−.002*	−.002**	−.002**
Race and ethnicity					
Non-Latino white (reference)		—	—	—	—
Non-Latino black		.122*	.092	.053	.061
Mexican		.040	−.030	−.052	−.043
Puerto Rican		.128*	.072**	.039	.028
Cuban		−.013	−.034	−.035	−.031
Chinese		−.052	−.022*	.020	.013
Filipino		.079	.131*	.135**	.129*
Other		.038	.012	.007	.006
Duration of residence in U.S.					
Native-born (reference)		—	—	—	—
Less than 5 years		−.071*	−.121*	−.071*	−.059
5–9 years		−.108	−.136	−.093	−.080
10 years		−.113*	−.130*	−.094*	−.084
15 years or more		−.122	−.121	−.091	−.090
Marital status					
Married (reference)		—	—	—	—
Cohabiting		.066*	.023*	.042*	.036*
Divorced/separated		.045*	.010	.014	−.003
Widowed		.126	.049	.075	.067
Never married		.083	.021	.044	.039
Family size		−.000	−.008***	−.011**	−.011**
Highest school grade completed			−.012*	−.007*	−.006*
Family income-to-poverty ratio			−.007*	−.001	−.004
Missing			−.049*	−.043*	−.031*
Employed			−.189**	−.190**	−.169***
Any $$ barriers to medical care			.159*	.136*	.081*
Smoking status					
Never smoked (reference)				—	—
Current smoker				.021	.005
Former smoker				.090	.086
Drinking status					
Lifetime abstainer (reference)				—	—
Former drinker, none last year				.089*	.072*
Current, 1–2 drinks per occasion				−.049	−.055
Current, 3–4 drinks per occasion				−.046	−.056
Current, 5+ drinks per occasion				−.017	−.034
Muscle-strengthening exercise				−.007	−.006
Body Mass Index				.020*	.019*
Depressive mood					.144***
R^2	.23	.24	.27	.29	.31

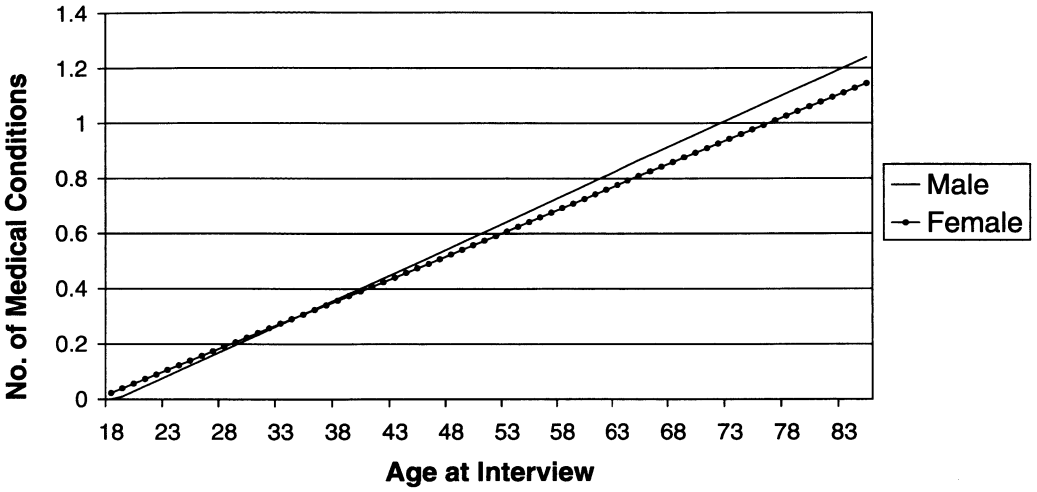
* $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed t-test)

Notes: N = 151,717. OLS = ordinary least squares. All models control for year of survey.

psychosocial factors in explaining observed differences. None of the measures reduces the interaction between gender and age to non-significance, nor does controlling for life-threatening medical conditions in model 6. However, as illustrated in Figure 2, if we equalize men and women based on the measures in model 6, we would see younger women (under age 30) doing better than younger men in terms of the number of functional limitations they report. Yet this equalization does little to remedy the disproportionately high number of functional limitations reported among older women—a difference that gets larger with increasing age.

Table 4 presents regression coefficients from ordered logit models predicting self-rated health. Model 1 shows that the interaction between gender and age is significant. In calculations not shown here, we find that men are more likely than women to report "excellent" health at younger ages, but the gap closes with

FIGURE 1. Predicted Values: Life-Threatening Medical Conditions

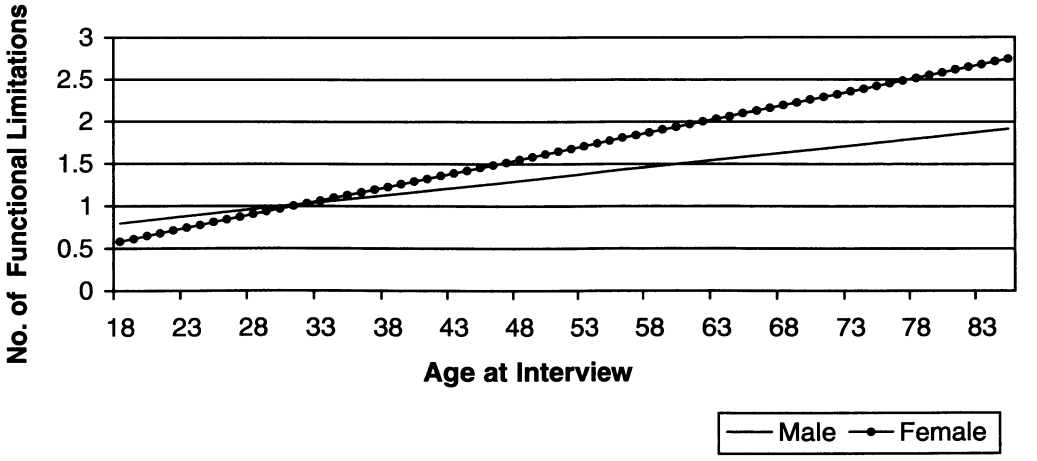


Note: **Based on Model 5, Table 2.**

age (supporting hypothesis 3). Women are more likely than men to report "good" or "very good" health at younger ages, but the gap diminishes with age. Finally, there are no gender differences in "poor" or "fair" health at any age. Looking across the models, we see that the interaction term is strengthened by adjusting for demographic characteristics and health conditions, and that SES and depression appear to account for a substantial portion of the self-rated health gap between women and men.

We graph the gender-by-age interaction from model 6 in Figure 3. Since we ran an ordered logit model for self-rated health, we can calculate predicted probabilities for each of the five categories of self-rated health. For presentation, we only graph the probabilities for "poor," "good," and "excellent" health ("fair" and "very good" track closely with "poor" and "excellent," respectively). Figure 3 shows that if men and women had similar profiles, men would be slightly more likely to report "excellent" health in the early adult years, but the decline in health among men is greater than for women; with increasing age

FIGURE 2. Predicted Values: Functional Limitations



Note: **Based on Model 6, Table 3.**

TABLE 3. Unstandardized Coefficients from OLS Regression Models: Number of Functional Limitations

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	−.295**	−.109*	−.371*	−.345**	−.455**	−.496**
Age	.041**	.045***	.030**	.026*	.028**	.017*
Female × age	.017**	.012*	.013**	.014**	.014**	.016**
Race and ethnicity						
Non-Latino white (reference)		—	—	—	—	—
Non-Latino black		.242	.072	−.040	.027	−.011
Mexican		.152***	−.224*	−.250*	−.183*	−.156**
Puerto Rican		.584	.265	.180	.089	.072
Cuban		−.169	−.284	−.284	−.252	−.234
Chinese		−.248	−.085	.020	−.039*	−.047*
Filipino		−.164	.116	.134	.084	.004
Other		.140	−.009	−.014	−.022	−.026
Duration of residence in U.S.						
Native-born (reference)		—	—	—	—	—
Less than 5 years		−.266*	−.545*	−.393*	−.300	−.263
5–9 years		−.256	−.406	−.268	−.176*	−.126*
10 years		−.323	−.411	−.289	−.218	−.166
15 years or more		−.363**	−.343**	−.249**	−.243*	−.188**
Marital status						
Married (reference)		—	—	—	—	—
Cohabiting		.424*	.172*	.204*	.157	.135
Divorced/separated		.449	.231	.219	.084	.087
Widowed		.769	.333	.406	.342	.300
Never married		.370*	.014*	.093*	.052*	.027
Family size		.019	−.019*	−.029*	−.028*	−.021*
Highest school grade completed			−.054*	−.037*	−.027	−.023
Family income-to-poverty ratio			−.051**	−.042**	−.031*	−.028*
Missing			−.288*	−.271*	−.172*	−.153*
Employed			−1.043*	−1.051**	−.888**	−.783**
Any $$ barriers to medical care			1.049*	.959*	−.524*	.475
Smoking status						
Never smoked (reference)				—	—	—
Current smoker				.251*	.123	.120*
Former smoker				.129	.099	.045*
Drinking status						
Lifetime abstainer (reference)				—	—	—
Former drinker, none last year				.443*	.329	.284
Current, 1–2 drinks per occasion				−.098	−.145	−.111
Current, 3–4 drinks per occasion				−.141	−.230*	−.195**
Current, 5+ drinks per occasion				−.124	−.262	−.240
Muscle-strengthening exercise				−.033*	−.033*	−.029*
Body Mass Index				.055*	.048*	.036*
Depressive mood					1.138**	1.049*
Number of life-threatening medical conditions						.617**
R^2	.15	.16	.24	.26	.34	.36

* $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed t-test)

Notes: N = 151,684. OLS = ordinary least squares. All models control for year of survey.

women are more likely than men to report their health as "excellent." The probability of reporting "good" health increases for both men and women with age, albeit at a faster pace for men, and both groups are unlikely to report "poor" health at any age. Men become more likely than women to report "good" health with increasing age; this may reflect the shift of women into the more optimum categories of "very good" and "excellent" health, or it may reflect an attitude shift among men associated with longevity (i.e., given their higher mortality rate, as men survive to older ages they may be more likely to view their health as good).

DISCUSSION

This article provides further insight into the complexities associated with gendered health disparities by examining differences in men's and women's health for multiple physical health measures across adulthood. Drawing on prior research, we developed three hypotheses

TABLE 4. Coefficients from Ordered Logit Regression Models: Self-Rated Health

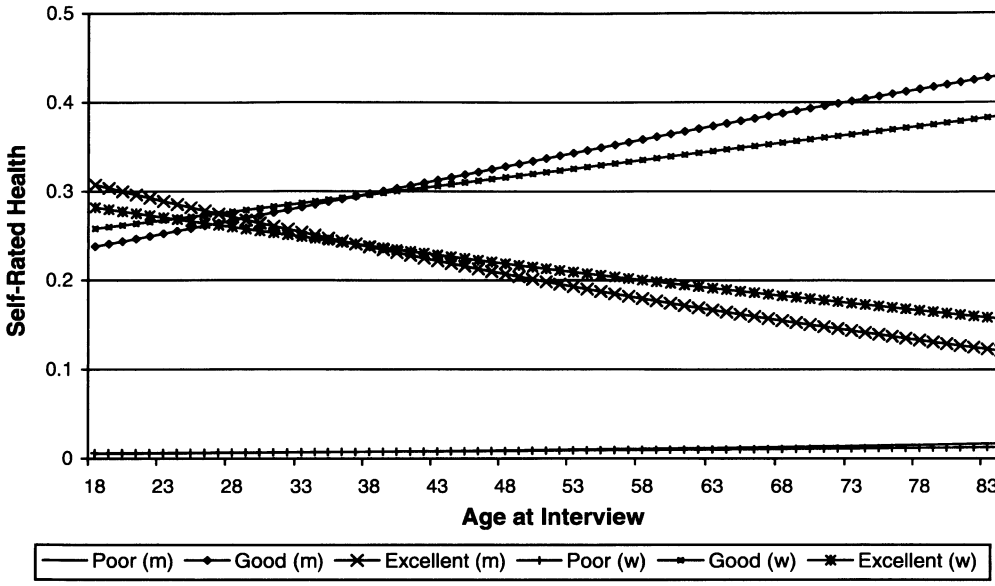
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	−.247***	−.311***	−.205***	−.237***	−.167***	−.239***
Age	−.034***	−.040***	−.033***	−.031***	−.034***	−.017***
Female × age	.002***	.004***	.004***	.004***	.004***	.006***
Race and ethnicity						
Non-Latino white (reference)		—	—	—	—	—
Non-Latino black		−.535***	−.370***	−.292***	−.345***	−.323***
Mexican		−.563***	−.067**	−.077***	−.121***	−.193***
Puerto Rican		−.673***	−.377***	−.306***	−.262***	−.246***
Cuban		−.302***	−.180***	−.171***	−.194***	−.302***
Chinese		−.157***	−.441***	−.560***	−.538***	−.559***
Filipino		−.018*	−.364***	−.422***	−.393***	−.332***
Other		−.328***	−.211***	−.224***	−.223***	−.237***
Duration of residence in U.S.						
Native-born (reference)		—	—	—	—	—
Less than 5 years		.067**	.342***	.210***	.158***	.065**
5–9 years		.064	.278***	.153***	.101***	.030**
10–14 years		.024	.210*	.089	.045	−.047
15 years or more		.106***	.166***	.064*	.058*	−.050
Marital status						
Married (reference)		—	—	—	—	—
Cohabiting		−.420***	−.173***	−.169***	−.139***	−.089***
Divorced/separated		−.400***	−.154***	−.122***	−.038*	−.024
Widowed		−.211***	.232***	.163***	.211***	.347***
Never married		−.315***	−.011	−.097**	−.067	−.033
Family size		−.020**	.029***	.040***	.042***	.032***
Highest school grade completed			.105***	.080***	.076***	.072***
Family income-to-poverty ratio			.064***	.053***	.046***	.040***
Missing			.040***	.029***	−.032***	−.010***
Employed			.464***	.504***	.426***	.167***
Any $$ barriers to medical care			−.954***	−.861***	−.610***	−.491***
Smoking status						
Never smoked (reference)				—	—	—
Current smoker				−.515***	−.446***	−.434***
Former smoker				−.177***	−.163***	−.097***
Drinking status						
Lifetime abstainer (reference)				—	—	—
Former drinker, none last year				−.230***	−.163***	−.056***
Current, 1–2 drinks per occasion				.210***	.250***	.211***
Current, 3–4 drinks per occasion				.164***	.234***	.173***
Current, 5+ drinks per occasion				.042	.138**	.085***
Muscle-strengthening exercise				.132***	.137***	.132***
Body Mass Index				−.056***	−.053***	−.032***
Depressive mood					−.745***	−.449***
Health conditions						
# of functional limitations						−.252***
# of life-threatening medical conditions						−.598***
Pseudo R^2	.04	.04	.09	.10	.12	.17

* $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed t-test)
Notes: N = 151,651. All models control for year of survey.

that led us to examine gender-by-age differences in life-threatening medical conditions, functional limitations, and self-rated health. We also assessed the relative importance of various mediating mechanisms (e.g., SES, health behaviors) for explaining observed differences. Some of the findings support our hypotheses and are consistent with prior studies, while others challenge the dominant paradigm used to explain gender differences in health.

First, we find that the degree of disadvantage women experience is not uniform, and the size of the disadvantage varies by age and health measure examined. The hypothesized relationship for life-threatening medical conditions appeared to receive little support, as our baseline model shows that while reported conditions increase with age, there is no gender difference in the pace of this increase, contradicting prior research (e.g., Verbrugge 1985). Once we adjusted for marital status, however,

FIGURE 3. Predicted Probabilities: Self-Rated Health



Note: **Based on Model 6, Table 4.**

the expected pattern emerged: life-threatening medical conditions increase with age, but at a faster pace for men. Ancillary analyses (not presented here) show that the gender-age interaction holds only for persons who are married or divorced/separated. It is not clear why this relationship holds only for these persons, but questions pertaining to life-threatening medical conditions necessitate some interaction with the health care system (i.e., all questions start with "have you ever been told by a doctor or other health care professional . . ."). Because one of the reasons why men benefit from marriage is through their increased contact with the health care system (presumably because their wives encourage them to see a doctor more frequently than men who are not married), the suppressor effect for marriage may indicate that men who are married or divorced/separated are significantly more likely to report a life-threatening medical condition because they interact with the health care system at a rate more similar to women, while men who are never married, cohabiting, or widowed do not. While one may expect this effect to be present among persons who are widowed, widowed men are much older than married and divorced/separated men, suggesting that the health decline associated with age is a more powerful force driving their interaction with the medical system than their former status as a married person.

Only for functional limitations do we see consistent female excess in morbidity throughout adulthood, and the disparity is striking. As hypothesized, the size of the gender gap increases steadily with age, and the gender-by-age relationship is fairly insensitive to adjustment for background characteristics. In other words, even if men and women were equivalent with regard to these characteristics, women would still report a significantly higher number of functional limitations, and the size of their disadvantage would continue to grow with age. Thus, as other researchers have done, we find that disability is a burden that weighs more heavily upon women than upon men in the United States.

For self-rated health, our models reveal that if men and women were more similar, women would be more likely to report "excellent" and "very good" health than men for most of adulthood. Given the multifarious process involved in an individual's self-assessment of her or his health status (Idler and Benyamini 1997), it seems logical that the gender disparity in self-rated health is sensitive to adjustment not only for the resources that can be used to purchase better health (e.g., income) but also for the mental and physical conditions that influence

how they feel on a daily basis (e.g., depression, other health conditions). These findings mirror those of other studies (Bird and Fremont 1991; Ross and Bird 1994) and suggest that improving women's social position would help them improve how they assess their overall health. The lack of an observed gender difference in reporting "poor" health may reflect the very serious nature of self-identifying as such, wherein both men and women choose this category only if their health status is quite bad.

Supplementary analyses also revealed some interesting age patterns in the importance of socioeconomic status for physical health. While SES was a significant predictor of self-rated health at every age, different patterns emerged for our two other measures of health. For functional limitations, SES was not significant at the younger ages but emerged as a significant predictor as age increased. Given the strong relationship between age and disability, this finding is logical. For life-threatening medical conditions, we found a curvilinear relationship wherein SES was not significant at the youngest and oldest ages but was a strong predictor for most of the adult life course (between the ages of 30 and 74). This likely reflects the general absence of life-threatening medical conditions in early life and the inability of SES to mediate life-threatening medical conditions in later life. In other words, the pathways linking SES to life-threatening medical conditions (e.g., prevention, access to care) are least salient during these years.

Our study also highlights the important role of depression in shaping the gender gap in morbidity, as depression is a salient predictor of each health measure and accounts for a substantial portion of the gender gap in functional limitations and self-rated health.[2] Prior research has established that women are more depressed than men (Rieker and Bird 2000), but more research on the role of depression in shaping the physical health status of men and women is needed. However, it is likely that the relationship between depression and physical health is bidirectional, such that poor physical health increases the likelihood of depression and vice versa (Dunlop et al. 2004). Additional research using longitudinal data is needed to sort out the causality issues surrounding the link between mental and physical health. Our findings do show that implementing policy measures that allow for easier diagnosis and treatment of depression in women might go a long way toward improving the morbidity profile of women, vis-à-vis men.

This paper is not without limitations. First, our inability to account for gender differences in functional limitations and life-threatening medical conditions may reflect the rather limited set of explanatory measures contained in the National Health Interview Survey. While we include depression, we are unable to assess the role of other psychosocial measures (e.g., stress, sense of control, and social support), an unfortunate omission given that prior work has demonstrated that men and women differ in these characteristics. For example, Ross and Mirowsky (2002) document a gender gap in personal control, with the sense of personal control declining more rapidly with age for women than for men.

Second, the findings for age may reflect cohort differences and thus may not fully represent the manner in which morbidity risks change as men and women age over time. Because the NHIS is a cross-sectional survey, the respondents represent a cross-section of different birth cohorts, including persons born between 1978–1983 among the 18-year-olds, and persons born in 1912–1916 (and earlier) among persons ages 85 and above. The period of history in which these cohorts have lived varies substantially. Accordingly, not only has the gendered nature of the health environment changed over time,[3] but the structure and meaning of social roles and health behaviors known to influence gender disparities in health—e.g., the nature and meaning of work, marriage and family formation, smoking behavior—have also changed dramatically across these birth cohorts (Cherlin 1992; Oppenheimer 1994; Wallace et al. 2003). To address these limitations, we need longitudinal studies that contain information on multiple measures of health and on behaviors and characteristics known to influence gender disparities in the United States.

Third, mortality selection may be influencing the relationship between gender, age, and physical health. Because men die at a higher rate than women across the life course, it is likely that the men in our sample are somewhat selective, in that the unhealthiest men are not included because of prior mortality. If mortality selection was not present, the morbidity gap between men and women (especially at older ages) would be smaller than observed in this

article, as morbidity rates among men would be higher.

Overall, these results have important implications for researchers and policy makers. First, they suggest that research on gender differences in health should continue to examine multiple health outcomes across adulthood, as the size of the difference in men's and women's health varies considerably by age and health status measure. We find that gender differences in health are often small, and we, along with other researchers (Macintyre et al. 1996), question how meaningful these rather small differences in men's and women's health are to a person's day-to-day well being.

Second, and of overwhelming relevance for public policy and health care researchers, is the need to understand and respond to women's greater burden of functional limitations at every age of adulthood, particularly in middle and late life. Functional limitation is a critical health outcome that affects daily life, and our findings not only support prior studies that document higher levels of disability among women (e.g., Lubitz et al. 2003), but also show that the size of excess disability increases with age.

Finally, public policy must continue to address the causes and consequences of women's disadvantaged social position relative to men. The significance of socioeconomic status in our models highlights the health gains for women that would accompany improvement in their socioeconomic standing. While the benefits for functional limitations and life-threatening medical conditions are not as great as for self-rated health, these findings suggest that, at the minimum, improvements in the socioeconomic status of women would likely result in a dramatic upswing in how they feel about their general health status.

NOTES

1. Model 6 is only included in Tables 3 and 4 because having a life-threatening medical condition is a relevant predictor of both functional limitation and self-rated health, and functional limitation is an important predictor of self-rated health status.
2. Additional models revealed that the relationship between depression and health is not sensitive to age.
3. For example, there was a 3.5-year gender gap in life expectancy at birth in 1930 (58.1 years for males and 61.6 years for females). By 2000 the gender gap was 5.4 years, and the life expectancy at birth had risen significantly for both groups, to 74.3 years for males and 79.7 years for females (Arias 2004).

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