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Understanding Gender and Health

Old Patterns, New Trends, and Future Directions

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A central feature of mortality trends throughout the twentieth century is the sex/gender difference in life expectancy: in the United States, women live on average 5.2 years longer than men do (NCHS 2009). Women have not always held a mortality advantage (Berin, Stolnitz, and Tenenbein 1990) and it may not continue. In fact, the age-adjusted gender gap in longevity appears to widen and narrow due to environmental/behavioral risk and protective factors, as well as genetic, biological, and hormonal processes (Annandale 2009). Biomedical and social science researchers who have pursued the causes of men's and women's differential mortality seldom agree on explanations, partly because, as Nathanson (1984, 196) stated in her discussion of the literature on differences in men's and women's health, "investigators' disciplinary orientations are reflected in specification of what is to be explained . . . in their choice of potential explanatory variables, and in the methods they employ; . . . the biologist sees hormones; the epidemiologist, risk factors; and the sociologist, social roles and structural constraints."

Even sociologists' understanding of the differences and similarities in men's and women's physical and mental health has changed dramatically over the past twenty-five years. Reviews of this literature indicate that researchers have often asked the wrong questions. For example, "Which is the weaker sex?" is framed in the binary language of biological advantage of one sex over the other and "Which gender is more advantaged?" assumes social advantage of one gender over the other. Even if there are real circumstances where biological superiority and social inequality can be observed, the framing of such questions implies that biological differences or social positions and roles can be summed up to determine which sex is the fittest or which gender is the most privileged. At best, this approach produces oversimplified models of the complex patterns of gender differences in health with little thought given to similarities.

A binary approach has the additional limitation of treating men and women as distinct homogenous groups, whereas gender differences in health vary substantially by age, race/ethnicity, and socioeconomic status. The dichotomy also ignores the wide array of gender identities and sexualities. Although men and women do seem to have on average some unique biological advantages and disadvantages over each other, substantial variation occurs among women and among men, and these differences seem to vary with certain social conditions (Fausto-Sterling 2005, 2008). It is still the case that much of clinical research tends to minimize or ignore the social and environmental processes that can influence health differentially and to reify biomedical models that portray men's and women's health disparities as inherently biological or genetic.

In recent years, a growing number of clinical researchers has come to recognize that social and biological factors interact in complex ways, and that this explains not only health or illness at the individual level but also population health and the observed patterns of men's and women's health and longevity in general. Yet relatively few biomedical or sociological studies examine both sets of factors (Institute of Medicine 2001a, b), highlighting the need to move beyond the binary in thinking and research, as ultimately integrating them will contribute to better science. Biological "sex" and social "gender" processes can interact and may be confounded. In acknowledgement of this, we use the term "gender" to refer to observed differences in men's and women's lives, morbidity, and mortality.

In this chapter, we briefly review gender differences in longevity and health in the United States and cross nationally, examine U.S. disease patterns for four specific conditions to illustrate gender disparities, review recent findings on the relationship between mental and physical health and its possible connection to gender differences in health, and consider limitations of current approaches to understanding men's and women's health. We suggest that in contrast to prevailing models of inequality, our integrative framework of constrained choice describes how decisions made and actions taken at the levels of family, work, community, and government shape men's and women's opportunities to pursue health and contribute to observed disparities. The constrained-choice model and gender-based analysis provide a new direction for discourse, research, and policy. We close with suggestions of interesting questions and issues for researchers to consider.

Gender Gaps in Health and Longevity: Puzzle or Paradox?

For decades differences in men's and women's longevity and physical health have been considered paradoxical, although some challenge the conception of a "gender paradox" (Hunt and Annandale 1999). In the United States, as in most industrialized countries, men live shorter lives than women do, yet women have higher morbidity rates and in later years a diminished quality of life. The gender gap in longevity in the United States has been decreasing, from 7.8 years in 1970 to 5.2 years in 2006 (NCHS 2009). U.S. women's life expectancy has exceeded that of men since 1900, with women experiencing lower mortality rates in every age group and for most causes of death. Even though the female advantage is persistent and life expectancy has been increasing for both men and women, the gender gap in longevity has been closing in the United States and other countries. For example, Annandale (2009, 128) shows that between 1969 and 2007 in the United Kingdom men gained 9.0 years compared to women's 6.7 years. The same decreasing gender gap prevails in most industrialized countries, including Sweden, Finland, and Australia.

This female longevity advantage pattern holds worldwide except in the poorest countries, where life expectancy is low for both men and women (WHO 2006). However, the causes of death and gender difference in mortality rates vary substantially across age groups, as do the leading contributing factors (WHO 2008). For example, the higher infant mortality rates among boys compared to girls in the United States and other developed countries may have largely biological causes, such as congenital abnormalities and X-chromosome immune-related disorders (Abramowicz and Barnett 1970; Waldron 1998), while the gender gap among young adults between the ages of nineteen and twenty-two years may have primarily behavioral causes, such as motor vehicle accidents and homicide. Similarly, the gender gap in mental health is both age- and disorder-specific, with women experiencing higher rates of depression and anxiety, and men experiencing higher rates of alcoholism, other substance abuse, and antisocial behaviors (Bird and Rieker 2008; Kessler, Barker, et al. 2003; Kessler, Berglund, et al. 2003).

Life Expectancy Cross-Nationally

When we consider data on cross-national gender differences in life expectancy, the paradox becomes even greater. The comparative life expectancy rates listed in Table 4.1 help capture these differences, showing that both the size of the gender gap and the pattern of longevity vary considerably by country and by national wealth (United Nations 2005). As one would expect, the gap in life expectancy at birth between the thirty countries with the highest life expectancy and the thirty with the lowest life expectancy is dramatic, ranging from 82.3 years in Japan to 40.5 years in Zambia and 40.9 years in Zimbabwe.

The countries with the lowest life expectancy, with few exceptions, are mainly poor countries in Southeast Asia and sub-Saharan Africa. However, a country's wealth does not necessarily guarantee higher average longevity. For example, Japan ranks first in overall life expectancy (82.3) but sixteenth in its gross domestic product (GDP) per capita ($31,267). Luxembourg ranks first in GDP per capita ($60,228) but twenty-fourth in life expectancy (78.4 years). In fact, none of the four wealthiest countries (Ireland, United States, Luxembourg, and Norway) rank among the top five countries in terms of overall life expectancy.

Another interesting aspect of the information in Table 4.1 is that the variation in the gender gap in life expectancy itself is greater in the thirty wealthier countries (with higher overall life expectancy) than in the thirty poor countries (with lower life expectancy). The gap ranges from 3.2 to 7.5 years in the wealthier countries and –1.8 to 4 years in the poorer countries, with some exceptions. Pinnelli (1997), a demographer, has discussed "male supermortality" and suggests that a five-year life-expectancy gender gap favoring women might be normal. She also contends that a greater difference indicates that men may be disadvantaged, in part because of their aggressive and risky health behaviors, while a smaller gap indicates that women may be disadvantaged regarding access to medical care, diet, and restricted labor-force participation. One clear example of this is the overall decline in life expectancy in the Russian Federation (not shown in the table) with a thirteen-year gap between men and women (fifty-nine vs. seventy-two), which generally is attributed to men's excessive alcohol use and greater smoking, suicide, and homicide rates (Kalben 2002). While it is debatable whether a five-year gap reflects a normal or biologically driven gender difference in life expectancy, changing environmental hazards, such as pandemics or civil wars, might alter this interpretation by shifting the balance one way or the other. However, we generally agree that the current data tend to support Pinnelli's interpretation.

In contrast to the worldwide pattern of women outliving men, the difference disappears and is even reversed in several of the poorer countries, with women outliving men by one year or less, if at all (e.g., Zimbabwe, Zambia, and Malawi). The lower overall life span and the minimal gender gap in these countries illustrates the extent to which extreme poverty, political disruption, and disease-specific mortality patterns (such as AIDS, malaria, and other infectious diseases) diminish life expectancy for both men and women (Andoh et al. 2006; Rao, Lopez, and Hemed 2006). These data also suggest that if women do indeed have some biological advantages that contribute to greater life expectancy, they can be attenuated by harsh social conditions and restrictive gender roles. Although a country's wealth (as measured by GDP) can contribute to population health, it does not appear to be the main factor affecting the gender gap in life expectancy among relatively wealthy countries; but a specific wealth threshold may be more critical in poor countries.

The variability in the gender gap highlights the impact of differences in life circumstances overall, as well as between men and women. Having considered the variation in life expectancy across countries, we need also to consider how the causes of death differ geographically and by gender. In some parts of the world, adults typically die relatively young and most often from infectious disease (particularly Southeast Asia and sub-Saharan Africa). Yet even in these societies, the factors that contribute to early mortality differ somewhat for men and women. And the variation is not only by gender. For example, in countries with high rates of abject poverty such as Zambia and Zimbabwe, there are also geographic patterns to the leading causes of death both among men and among women. In Zambia (40.3 vs. 40.6) and Zimbabwe (41.4 vs. 40.2) there is little gender difference in life expectancy, which has been declining for both men and women due in large

Table 4.1. Countries with highest and lowest life expectancy, with GDP per capita

Countries with highest life expectancy						Countries with lowest life expectancy					
Country	Life expectancy at birth	Women	Men	Difference	GDP per capita	Country	Life expectancy at birth	Women	Men	Difference	GDP per capita
Japan	82.3	85.7	78.7	7.0	31,267	Senegal	62.3	64.4	60.4	4.0	1,792
Hong Kong, China (SAR)	81.9	84.9	79.1	5.8	34,833	Yemen	61.5	63.1	60.0	3.1	930
Iceland	81.5	83.1	79.9	3.2	36,510	Timor-Leste	59.7	60.5	58.9	1.6	N/A
Switzerland	81.3	83.7	78.5	5.2	35,633	Gambia	58.8	59.9	57.7	2.2	1,921
Australia	80.9	83.3	78.5	4.8	31,794	Togo	57.8	59.6	56.0	3.6	1,506
Sweden	80.5	82.7	78.3	4.4	32,525	Eritrea	56.6	59.0	54.0	5.0	1,109
Spain	80.5	83.8	77.2	6.6	27,169	Niger	55.8	54.9	56.7	–1.8	781
Canada	80.3	82.6	77.9	4.7	33,375	Benin	55.4	56.5	54.1	2.4	1,141
Italy	80.3	83.2	77.2	6.0	28,529	Guinea	54.8	56.4	53.2	3.2	2,316
Israel	80.3	82.3	78.1	4.2	25,864	Djibouti	53.9	55.2	52.6	2.6	2,178
France	80.2	83.7	76.6	7.1	30,386	Mali	53.1	55.3	50.8	4.5	1,033
Norway	79.8	82.2	77.3	4.9	41,420	Kenya	52.1	53.1	51.1	2.0	1,240
New Zealand	79.8	81.8	77.7	4.1	24,996	Ethiopia	51.8	53.1	50.5	2.6	1,055
Austria	79.4	82.2	76.5	5.7	33,700	Burkina Faso	51.4	52.9	49.8	3.1	1,213
Singapore	79.4	81.4	77.5	3.9	29,663	Tanzania	51.0	52.0	50.0	2.0	744
Netherlands	79.2	81.4	76.9	4.5	32,684	Chad	50.4	51.8	49.0	2.8	1,427
Germany	79.1	81.8	76.2	5.6	29,461	Uganda	49.7	50.2	49.1	1.1	1,454
United Kingdom	79.0	81.2	76.7	4.5	33,238	Burundi	48.5	49.8	47.1	2.7	699
Cyprus	79.0	81.5	76.6	4.9	22,699	Cote d'Ivoire	47.4	48.3	46.5	1.8	1,648
Finland	78.9	82.0	75.6	6.4	32,153	Nigeria	46.5	47.1	46.0	1.1	1,128
Greece	78.9	80.9	76.7	4.2	23,381	Malawi	46.3	46.7	46.0	0.7	667
Belgium	78.8	81.8	75.8	6.0	32,119	Congo	45.8	47.1	44.4	2.7	714
Ireland	78.4	80.9	76.0	4.9	38,505	Guinea-Bissau	45.8	47.5	44.2	3.3	827
Luxembourg	78.4	81.4	75.4	6.0	60,228	Rwanda	45.2	46.7	43.6	3.1	1,206
United States	77.9	80.4	75.2	5.2	41,890	Central African Republic	43.7	45.0	42.3	2.7	1,224
Denmark	77.9	80.1	75.5	4.6	33,973	Mozambique	42.8	43.6	42.0	1.6	1,242
Korea (Republic of)	77.9	81.5	74.3	7.2	22,029	Sierra Leone	41.8	43.4	40.2	3.2	806
Portugal	77.7	80.9	74.5	6.4	20,410	Angola	41.7	43.3	40.1	3.2	2,335
Slovenia	77.4	81.1	73.6	7.5	22,273	Zimbabwe	40.9	40.2	41.4	–1.2	2,038
Brunei Darussalam	76.7	79.3	74.6	4.7	28,161	Zambia	40.5	40.6	40.3	0.3	1,023

Source: United Nations 2005

part to political turmoil and the countries' inability to control infectious diseases. In fact, a review of the data on the ten countries with the highest seropositivity rates over the past fifteen years shows that the female gender advantage decreases as HIV prevalence increases, a further reminder that neither the trends nor the gaps in life expectancy will remain constant over time, particularly as the leading causes of death vary with changing social and environmental circumstances (Velkoff and Kowal 2007).

Thus, it is clear that biological sex differences between men and women are not equally advantageous (or disadvantageous) in all circumstances; consequently the gender differences in mortality are dynamic. This insight is not new. Kalben (2002, 2) quotes a 1974 report by the Committee on Ordinary Issuance and Annuities that noted that differences in the leading causes of death "strongly suggest that sex differentials in mortality are due to biological as well as environmental factors and that the relative importance of the biological components varies by sex and social circumstances."

There is little precise understanding of the biological and social factors or pathways between them that can or do widen or narrow the gender gap in both longevity and general health. Although many reasons for the variation have been identified, biological or social factors alone are not considered a sufficient explanation for the cross-national gender differences (Kalben 2002; Krieger 2003; Yin 2007). Some social scientists argue that health status differences among individuals and groups within a country are due to income inequalities or other fundamental social causes (Phelan et al. 2004), while others contend it is the status syndrome associated with positions in the social hierarchy that explains such phenomena (Marmot 2004, 2005). Cross-national differences in life expectancy are often linked to a country's wealth (Kawachi and Kennedy 2006) or to the distribution of income within a country (Wilkinson 1996). Moreover, when Krieger and colleagues (2008) examined inequities in premature mortality rates in the United States between 1960 and 2002, they found that as population health improves the magnitude of health inequalities can either rise or fall, and the reasons for the observed trends are largely unknown. For the most part, the general explanations of population health disparities are not focused on gender differences or the gender gap, so they don't provide a comprehensive understanding of these complexities.

However, some evidence of what contributes to the gender gap is provided by biomedical studies of sex-related changes in mortality rates in cardiovascular diseases and other specific diseases. In an influential article, Verbrugge and Wingard (1987) explained the paradox of men's higher mortality and lower morbidity compared to women's on the basis of gender differences in the patterns of disease. Unlike others who advanced the prevailing paradigm of focusing on men's premature mortality, Verbrugge and Wingard also called for researchers and clinicians to move beyond the focus on men's higher cardiovascular disease (CVD) mortality toward a more nuanced view of the gender differences in disease patterns over the life course. They also offered more complex explanations of the implications of gender differences in disease prevalence, including women's increased risk for CVD after menopause and their greater morbidity from debilitating illnesses such as rheumatoid arthritis. But a knowledge gap remains in understanding the sex-specific differences in the epidemiology of many specific diseases, and most notably cardiovascular diseases.

Disease Patterns in the United States

Our examination here of four conditions that vary considerably by gender—CVD and immune function disorders for physical health, and depression and substance abuse for mental health—is not intended to be exhaustive; rather we seek to provide a more complex portrait of specific patterns of gender difference in mental and physical health that extends beyond the life expectancy and mortality difference. We contend that this more nuanced picture also requires more multifaceted explanations than are typically articulated in a summary of gender differences in health.

Cardiovascular Disease (CVD)

CVD is the world's leading cause of death, causing one-third of all deaths globally, and the single largest cause of death among both men and women worldwide. In the United States, 8.4 percent of men and 5.6 percent of women report a diagnosis of CVD (Thom et al. 2006). Historically, men have greater prevalence and age-adjusted CVD mortality rates than women, a consistent finding across most developed countries (WHO 2006). While men outnumber women three or four to one in mortality from coronary heart disease (CHD) before age seventy-five, the gender difference in prevalence and incidence narrows at older ages (Verbrugge and Wingard 1987). A growing body of research indicates that despite later onset in women, risk factors such as smoking, family history, depression, diabetes, and inflammation (measured using C-reactive protein) may have a more negative influence on CVD in women than in men (Bassuk and Manson 2004; Pai et al. 2004; Thorand et al. 2007).

Due in part to earlier onset among men than among women, CVD also contributes substantially to gender differences in the number of years lived with and without CVD and related conditions (Crimmins, Kim, and Hagedorn 2002). For example, Crimmins and colleagues indicate that a cohort of women in the United States will experience 70 percent more years of life after age sixty-five with hypertension than a similar-sized birth cohort of men. Today, the patient undergoing treatment for CVD and hypertension is likely to be a woman beyond middle age. Yet until recently, scientists and clinicians focused on explaining and addressing the earlier onset of CVD in men, whereas the role of biological mechanisms in women's greater lifetime risk remained largely unexplored.[1] Ultimately women's increased inclusion in research led to a dramatic shift in knowledge and understanding regarding women's CVD risk (see Bird and Rieker 2008 for details on the Women's Health Initiative and this shift in research). However, this shift is only beginning to produce insights into the antecedents of gender differences in risk and life expectancy differences. For example, Shetty and colleagues (2009) took advantage of the sharp drop in women's use of Hormone Replacement Therapy (HRT) following the negative findings reported in 2002 regarding HRT and CVD to conduct an observational study of the relationship between HRT use and cardiovascular outcomes in the entire U.S. population. They found that the decreased use of HRT was associated with a decreased acute myocardial infarction rate among women but not with a reduced stroke rate.

Immune Function and Disorders

Researchers and clinicians are challenged and perplexed by the sex-linked patterns of immune function and disorders. The sex ratios in immune function also contribute to substantial differences in men's and women's disease risks and longevity. Although men and women tend to develop different disorders, women still have a greater risk than men of autoimmune rheumatic disorders and a higher risk of genetic immune suppression disorders (Jacobson et al. 1997; Lockshin 2001; Walsh and Rau 2000). Although the incidence of female/male ratios varies, the severity of the disease does not. For example, the female-to-male ratio of lupus, Graves', and Sjögren's is 7–10:1; that of rheumatoid arthritis, scleroderma, and multiple sclerosis is 2–3:1; while Type 1 diabetes and inflammatory bowel disease have equal sex frequencies (Lockshin 2006). Much of the disability men and women experience from rheumatologic and thyroid disorders, especially from middle age on, can be attributed to autoimmune disease. However, the differences in incidence in the most common disorders contribute to women's greater morbidity.

Since Selye's original work (1956) delineating physiological responses to stress, transdisciplinary research has greatly expanded our knowledge of human physiology and the ways that it can be influenced by social psychological phenomena (see Dedovic et al. 2009 for a review of gender socialization and stress reactivity). A growing body of evidence indicates that a variety of psychosocial factors can affect physiologic processes with implications for immune function. Researchers have described various possible pathways through which psychological factors impact immune function (Kiecolt-Glaser et al. 2002a, b). For example, some researchers and physicians argue that gender differences in men's and women's exposure to environmental substances and experiences of stress also contribute to gender differences in autoimmune disease incidence and severity

(Legato 2002; Lockshin et al. 1999). Moreover, there is considerable debate about whether sex hormones, including estrogen and testosterone, affect inflammatory and immune responses (Begg and Taylor 2006; Lockshin 2006; Lockshin, forthcoming).

Mental Health

Although the overall rate of mental health disorders in the United States is similar for men and women, researchers, clinicians, and even women's rights advocates believed until the early 1990s that women suffer from higher rates of mental illness than do men (Chodorow 1978; Cleary, Mechanic, and Greenly 1982; Dohrenwend and Dohrenwend 1976, 1977; Gove and Tudor 1973). This assumption was based largely on the higher prevalence of depression among women and the fact that more women than men sought care for mental health problems. In addition, clinical studies suggested that the gender differences in depression had a hormonal basis and were at least partly biological, while sociologists contended that the differences were due to gender inequalities and restricted social roles.

However, findings based on the 1991 Epidemiologic Catchment Area Data (ECA) revealed that there are no large gender differences in the overall prevalence of major psychological disorders, whether one compares prevalence rates for one month, six months, a year, or a lifetime (Kessler, McGonagle, Zhao, et al. 1994; Regier and Robins 1991; Regier et al. 1993). Ten years later, the first nationally representative mental health study, the National Comorbidity Survey (NCS 1), confirmed these findings (Kessler and Walters 2002; Narrow et al. 2002).

The discrepancy with respect to prior findings is partly the result of the development of more rigorous research methods and of previous studies' focus on rates of depressive and anxiety disorders, which are higher among women; the ECA and the NCS included substance abuse, which is more common among men. The interpretation of the overall gender differences in mental health changed radically in light of new information on the full range of mental health disorders from these population-based studies. The new insights into men's and women's mental health reflected a typical pattern of scientific progress resulting from challenges to prior findings along with the application of more rigorous methods to answer both old and new questions.

In our discussion of gender differences in mental health, we focus on depression and substance abuse because they represent disorders with substantially different prevalence rates among men and women and because they create an enormous health burden (Kessler, Barker, et al. 2003). The World Health Organization (WHO) ranks major depression and substance abuse among the most burdensome diseases in the world (WHO 2002). Moreover, a growing body of research links depression and serious psychological distress with physical health (Pratt 2009; Whang et al. 2009), further illustrating the need to consider the interaction between physical and mental health in unraveling the puzzle of gender differences in health.

Depressive Disorders

Women's rates of depressive disorders are 50 to 100 percent higher than men's (Gove and Tudor 1973; Kessler, Barker, et al. 2003; Kessler, Berglund, et al. 2003; Mirowsky and Ross 2003). Until the recent men's health movement, women's disproportionately high depression rates generated the erroneous impression that men were comparatively immune to depression (Courtenay 2000a, b). Clinicians' underdiagnosis of men's depression has been linked to a combination of gender differences in the causes and symptoms of depression, men's unwillingness to seek help for such feelings, as well as men's tendency to cope with sadness and loss through drinking and drug use and through acting-out and risk-taking behaviors (Bird and Rieker 2008; Chino and Funabaki 1984; Courtenay 2000a, b; Nolen-Hoeksema 1987, 1990). When symptoms of depression are acknowledged and diagnosed, men as well as women appear to seek treatment (Nazroo, Edwards, and Brown 1998; Rhodes et al. 2002).

Although men and women do differ in the age and rates of onset of depression (young males have higher rates until early adolescence), the gender gap appears to be greatest during the reproductive years (Bebbington 1996; Piccinelli and Wilkinson 2000). Moreover, while crosssectional studies indicate that once major depression develops, the course is similar for both genders (Kessler, McGonagle, Swartz et al. 1993; Wilhelm, Parker, and Hadzi-Pavlovic 1997), several longitudinal studies have reported that girls and women have longer episodes and higher rates of recurrent and chronic depression (Aneshensel 1985; Ernst and Angst 1992; Keitner et al. 1991; Kornstein et al. 2000; Sargeant et al. 1990; Winokur et al. 1993). What is clear is that women have consistently higher lifetime prevalence rates for depression, and that depressed women are more likely than are men to have comorbid anxiety (Gregory and Endicott 1999; Kessler, Berglund et al. 2003), while men are more likely to have comorbid substance abuse or dependence (Endicott 1998; Kessler, Berglund et al. 2003). However the determinants of these gender differences and how they are related to substance abuse and other mental health disorders is unclear (Piccinelli and Wilkinson 2000).

Substance Abuse Disorders

Men have significantly higher rates of alcohol and drug use, abuse, and dependence, as well as antisocial behavior disorders, than do women (Kessler, McGonagle, Zhao et al. 1994; Regier et al. 1993). In fact, the prevalence of substance abuse disorders in men and women is the reverse of that seen for depression. The gender difference in prevalence of substance use is smallest among adolescents, increases with age, and varies by type and level of drug use (Kandel, Warner, and Kessler 1998).

Although those who initiate substance use earlier in life are more likely to continue using and to become dependent, not all users in any age group become dependent (even with highly addictive substances). With the exception of tobacco, lifetime dependence rates are considerably higher for men than for women (Kessler, Crum et al. 1997; Kessler, McGonagle, Zhao et al. 1994; Kessler, Nelson et al. 1996). It is unclear whether the gendered patterns in dependence among users are due to greater use of alcohol by men and of psychotherapeutics by women, or to other biological and environmental factors that vary by drug type (see Pescosolido et al. 2008 for a detailed and nuanced analysis of the pathway to alcohol dependence in men and women and the complex interplay between social and genetic influences). However, extensive comorbidity exists between drug and alcohol disorders, as well as with other psychiatric disorders in both men and women, especially in those with a major depressive disorder (Kessler, Berglund et al. 2003; Kessler, Nelson et al. 1996).

The emerging field of men's studies recognizes that while gender roles advantage men in some ways, they disadvantage them in others, and that not all men are equally advantaged nor are all women equally disadvantaged (Cameron and Bernardes 1998; Harrison 1978; Kimmel and Messner 1993; Pleck 1983, 1984; Pleck and Brannon 1978; Rieker and Bird 2000, 2005; Sabo and Gordon 1995). Work by Courtenay (2000a, b) and others has also begun to reexamine the role of masculine identities in the development of men's unhealthy and risky behaviors and subsequent mental and physical health problems. Other research has focused on stressors to which men are either more exposed or potentially more vulnerable, such as those in the workplace and in the military (Connell 1987; Jaycox 2008; Levant and Pollack 1995; Sabo and Gordon 1995). For instance, combat duty, which continues to be more common for men, puts soldiers at risk for post-traumatic stress disorder (PTSD), whereas physical and sexual abuse remains the most likely PTSD risk factor for women (Rieker and Carmen 1984).[2] In contrast, the stress associated with being unemployed can differ depending on one's options and constraints: unemployed women frequently have access to more socially acceptable roles than men do, including caregiver and housewife, which are more highly stigmatized for men and may therefore lead to greater stress or simply deter men from considering or accepting these roles (Lennon 2006). The high rates of combat duty in recent and ongoing wars and conflicts, along with the high current rates of unemployment, provide an important opportunity for much-needed research to better understand vulnerability to depression and PTSD and to learn more about how to provide better care to men and women afflicted with these debilitating disorders. Such research can also inform theories that explain both male and female psychological health and illness and the ways these gender patterns vary across race, class, and ethnicity.

Pathways and Mechanisms Underlying Gender Differences

Although social and biological pathways to illness and the mechanisms connecting them with gender differences in health are relatively unexplored, we would like to suggest some topics that warrant attention. For example, a growing body of research demonstrates that mental and physical health are deeply intertwined. Thus, not only can physical health problems cause symptoms that appear to be attributable to one's mental health or current mental state (such as fatigue, hopelessness), but also mental health conditions can exacerbate physical health problems, and serious or chronic physical health problems can lead to depression or anxiety. Understanding relationships between physical and mental health is relevant to researching and explaining health trajectories, identifying opportunities for intervention, and recognizing the full benefits of such interventions in terms of reduced morbidity and mortality.

Impact of Health Behaviors on Physical and Mental Health

Health behaviors are a primary pathway through which psychological distress and depression impact health. For example, a longitudinal study of patients with stable cardiovascular disease found that the association between depressive symptoms and subsequent cardiovascular events was explained in part by differences in health behaviors, including smoking, alcohol use, and level of physical activity (Whooley et al. 2008). Individuals with more depressive symptoms at baseline engaged in fewer positive and more negative health behaviors and consequently faced an increased risk of cardiovascular events.

Gender differences in both mental health and self-care may exacerbate the problem of negative effects of psychological distress and depression on specific health behaviors. In particular, although women engage more often in self-care behaviors than men do, they are somewhat less likely to engage in regular physical activity. Moreover, depressed mood may reduce any female advantage in health behaviors, as women typically begin to drop self-care behaviors before decreasing their caring for others (Rosenfield 1999). Depressed mood and other mental health problems may similarly affect men and women by reducing positive health behaviors, even though men and women engage on average in somewhat different positive behaviors (Reeves and Rafferty 2005; Whooley et al. 2008).

Recent research also suggests that some negative health behaviors play a central role in gender differences in health. For example, Grundtvig and colleagues (2009) examined data from 1,784 patients admitted for a first heart attack at a hospital in Lillehammer, Norway. Their retrospective study found that on average men had their first heart attack at age seventy-two if they didn't smoke, and at sixty-four if they did. In contrast, women in the study had their first heart attack at age eighty-one if they didn't smoke, and at age sixty-six if they did. If supported by prospective studies, their data suggest that smoking drastically reduces gender differences in age at first heart attack, narrowing women's advantage from nine to merely two years. Grundtvig speculated that smoking may lead to earlier onset of menopause in women, reducing the length of women's premenopausal protection from heart disease. Thus smoking represents a negative health behavior that is frequently used in part as a means of coping with stress, but that also interacts differently with men's and women's biology to increase their health risks. Other health conditions related to health behavior and cardiovascular disease have also been found to have a greater negative effect on women's health than men's. For example, diabetes in particular has been found to outweigh (and even eliminate) women's otherwise lower cardiovascular risk prior to menopause (Kannel and Wilson 1995; Sowers 1998). In regard to diabetes, Lutfey and Freese (2005) use ethnographic data to provide an in-depth analysis of the mechanisms that perpetuate disparities in diabetes treatment regimens, including some differences between men and women.

Social Norms, Biology, and Gendered Behaviors

As West and Zimmerman (1987) argued, a cost and consequence of living in a social world is the ongoing process of *doing gender*. Specifically, individuals are expected in innumerable social circumstances to express themselves in gender-appropriate ways (Ridgeway and Smith-Lovin 1999; Taylor et al. 2000). While gender roles have become far less circumscribed over time, gender scripts remain and are obvious even in fitness recommendations (Dworkin and Wachs 2009). Moreover, behaving and communicating in ways that are seen as gender appropriate are rewarded in subtle ways.

Recent work suggests that men and women also have some physiologic differences that may complement the social norms to behave in gender-appropriate ways. Partly in response to the extensive literature on the fight-or-flight response, most of which was theorized and studied in males (including animal studies), Taylor and colleagues (2000) began to study and write about the "tend or befriend" stress response, which they contend is supported by a hormonal response present only in females. They do not suggest that males are prevented from responding to stress with the same hypervigilance aimed at protecting and caring for others they found in females, but that in females, oxytocin encourages these specific behaviors. Compared to men, women tend to engage in more nurturant activities designed to protect the self and others that in turn promote safety and reduce distress. Women also tend to create and maintain social networks that may aid in this process. This gendered response to stress is encouraged and supported both socially and biologically (Ridgeway and Smith-Lovin 1999; Taylor et al. 2000). Unlike the fight-or-flight response, which is hormonally present in both men and women, oxytocin in conjunction with female reproductive hormones and endogenous opioid peptide mechanisms supports the "tend and befriend" stress regulatory mechanism. Taylor and colleagues proposed that the attachment-caregiving system forms the biobehavioral underpinnings of tending and befriending in response to stress. These in turn may contribute to differences in men's and women's CVD risk and mortality.

Pescosolido and colleagues (2008) provide another example in their study of how gendered stress reactions become part of the pathway to alcohol dependence. In their provocative findings, they explicate the causal pathway through which the gene GABRA2 interacts with social factors to produce gender differences in alcohol dependence. Specifically, they conclude that "genetic predisposition to alcohol dependence on GABRA2 is operative in men but not in women" (S192). The genetic inheritance of GABRA2 can become triggered or suppressed through social patterns. Daily hassles, past stressors, and the coping response differentiate men and women regarding their propensity to engage in "escapist drinking." The researchers contend that drinking to excess in public is also more acceptable for men and that such behavior sets men up for greater alcohol dependence, which then can be attenuated or exacerbated by early childhood deprivation and family-based social support.

Thus social processes and biological mechanisms can interact in complex ways to produce observed differences in men's and women's health. Earlier explanations of women's higher morbidity hinged largely or exclusively on the negative consequences of female social and economic disadvantages (for a review, see Wingard 1984), whereas the explanations of women's greater longevity focused solely on the hypothesized biological advantages of hormones (see Ramey 1982). Yet each explanation applied to only a narrow portion of the complex differences in men's and women's health. As we have argued elsewhere, what is needed to advance research and understanding of gender differences in morbidity and mortality is a synthesis of social and biological theories and evidence. To begin to address this conundrum, we introduced a model of constrained choice as a promising direction for understanding and researching gender differences and other health disparities (Rieker and Bird 2005).

Constrained Choice: A Different Way to View Health Disparities

Much of the recent work on health disparities focuses primarily on the contribution of socioeconomic status. We take a broader perspective on the range of factors that pattern individual lives. In so doing, we identify additional potential levers for addressing gender, racial/ethnic, and socioeconomic disparities in health. While population health and the health of disadvantaged subgroups are in part functions of the income distribution in a society, it does not necessarily follow that income redistribution is the most feasible and effective way to address such disparities. Nor is it clear that such efforts would address gender differences in health or effectively resolve disparities among men and among women (James et al. 2009; Murray et al. 2006). While other countries (notably, the Nordic countries) have instituted a multifaceted series of policies affecting the distribution of income, such policies are unlikely in the United States in the foreseeable future.

We offer constrained choice as an alternative framework that recognizes a wider range of contributing factors and thus identifies additional research foci and intervention points for improving individual and population health. Our approach is not intended to minimize the role of social inequalities in health or to emphasize individual behaviors over structural factors. To the contrary, we developed a framework that shows how structural constraints narrow the opportunities and choices available to individuals in both absolute and relative ways. In the extreme case, structural inequalities socially pattern health, creating or exacerbating particular gender, racial/ethnic, and socioeconomic disparities in health; for example, when discrimination creates differential opportunities for specific groups, it enhances or protects the range of opportunities for some while constraining them for others. But discrimination is not the only factor that socially patterns the constraints that men and women (as a group or individually) experience in their everyday lives and that also affect their health. While the impact of gender roles may be obvious —including differences in the distribution and nature of caregiving and other relationships at the level of family—the indirect health impact of decisions at the levels of community and social policy have received far less attention in research to date.

In *Gender and Health* (Bird and Rieker 2008), we presented the constrained-choice model to address these gaps. The multilevel model explains how decisions made and actions taken at the family, work, community, and government levels contribute to differences in individuals' opportunities to incorporate health into a broad array of everyday choices. We argue that the unintentional and cumulative consequences of constrained choice socially pattern women's and men's lives in differential ways that impact their exposure to stressors, their health behaviors, and their physiology. Therefore, we conclude that health is not only an individual responsibility but one shared by decision makers at multiple levels.

Levels and Processes of Constrained Choice

Individuals make everyday choices that create health outcomes. Furthermore, they make these choices in the context of family, employment settings, and community. For example, many young families must negotiate ongoing decisions on where to live, how to balance career with family life, child rearing, child care, and financial management. When attempting to meet these explicit priorities every day, young families may make immediate choices that are not health promoting. Consider a dual income family: over the course of a day a parent may choose to skip breakfast to ensure being able to drop a child off at daycare and get to work on time. A parent may bring home a fast-food dinner in order to spend time with family rather than spend time cooking, or simply to get food on the table quickly to feed a hungry family. Similarly, a parent may choose to sleep less in order to spend time with children, manage the household, or complete work-related tasks. None of these actions are necessarily gender-specific nor may any of them as discreet, individual actions result in major health consequences. Yet when the wider context shapes and constrains opportunities and choices, as it does in everyone's life to varying degrees, such trade-offs can have cumulative effects on health. These choices occur and play out in gendered ways, as men's and women's everyday decisions and priorities differ somewhat on average, due in part to differences in their social roles. Moreover, the consequences of such everyday actions cumulatively affect health, and their impact depends in part on innate and acquired differences in men's and women's biology or genetic predisposition.

Our model of constrained choice includes three levels of organizational context that can influence men's and women's health outcomes: social policy, community actions, and work and family (see Figure 4.1). The model demonstrates how decisions made within these organizational contexts can limit the opportunities that individuals have to choose healthy behaviors. Two recent reports on racial and ethnic disparities in women's health across the United States demonstrate clearly such constraints (James et al. 2009; Rustgi, Doty, and Collins 2009). The model also acknowledges how the interplay between gendered health choices and sex-specific biological patterns and responses can shape morbidity and mortality outcomes.

Work and Family

Many of the differences in men's and women's lives are rooted in their work and family roles. Men and women are exposed to different kinds of work, as well as differences in pay and other benefits. Occupations and social roles carry expectations, create routines of daily life, and establish norms of social interaction, all of which contribute to stress levels, health-related behaviors, and coping styles. For example, a role such as single parent or caregiver to aging parents or to children with special health-care needs can be time consuming and stressful, and these roles are more often performed by women. Moreover, both work and family roles include flexible or inflexible demands (such as urgent situations that require immediate attention) or routines that may not easily be combined with other obligations. Even for those who do not work from home, the boundaries between work and home life have become increasingly blurred as technology makes us always available. While in theory this flexibility increases the possibilities for managing conflicting demands, it also reduces the physical and temporal boundaries between work and home life for both singles and couples.

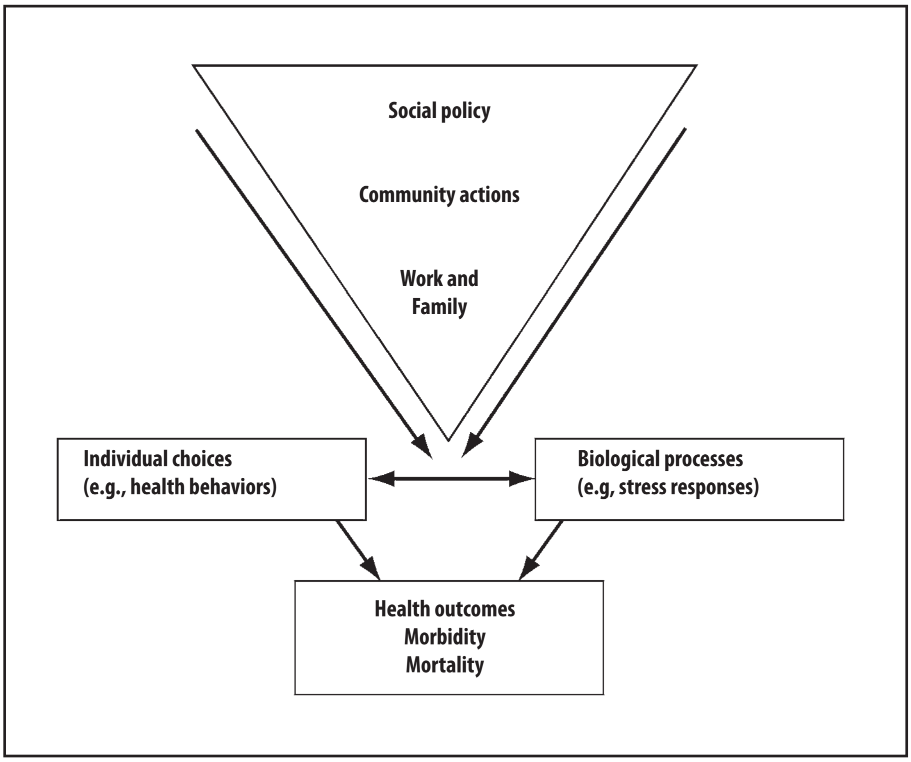

Figure 4.1. Conceptualization of Constrained Choice
Source: Bird, C.E., & Rieker, P.P. (2008). *Gender and health: The effects of constrained choices and social policies.* New York: Cambridge University Press.

Even though differences in men's and women's roles have diminished over time, the lingering differences have cumulative effects on health and on the ways in which family decisions impact health. For example, compared to men, women typically acquire more health information and take a larger role in the health of their families. Clearly men and women continue to be differentially distributed across industries and workplaces, with more women in service occupations and men more concentrated in manufacturing, transportation, and military work. Occupations and work environments differ substantially in both the demands placed on workers and the level of control individuals have over the speed and content of their work. Whereas some occupations and work environments provide manageable demands and healthy and supportive environments, others place substantial physical or emotional demands on employees. High-demand and low-control work has been shown to be particularly stressful in ways that impact health (Theorell and Karasek 1996). Workplaces also differ in the extent to which they provide work-life programs and policies that facilitate or even encourage positive health behaviors such as physical activity and healthy eating.

Some workplaces or work arrangements may indirectly promote destructive behaviors such as smoking, poor diet, or even excess alcohol consumption. For example, a British study demonstrated that working very long hours was negatively associated with women's, but not men's, health behaviors; among those who worked long hours, the women consumed more high-fat and high-sugar snacks, exercised less, and, if smokers, smoked more (O'Connor et al. 2005). There is generally less understanding about how men experience structural constraints, formulate their priorities, or respond to work and family stress, or about when and how, for example, they learn to turn to alcohol and drugs as forms of coping or self-care. Such information is essential to designing gender-appropriate interventions to improve men's and women's health.

Norms of long work hours can affect the costs and consequences of achieving success at work by reducing the possibility of balancing work, family, and time for exercise and other positive self-care activities. In their insightful critique of the media's role in selling the desire for perfect bodies rather than health and healthy behaviors, Dworkin and Wachs (2009) describe the different priorities and time constraints on men's and women's health behavior and self-care. In describing the barriers women face after pregnancy and childbirth, they characterize paid work as the first shift, work in the home (child care, feeding oneself and the family, paying bills, and otherwise maintaining a household) as the second shift, and the time spent pursuing health and fitness regimens that allow for adherence to the latest bodily requirements as promoted in the media as the third shift (see also Dworkin 2001; Dworkin and Messner 1999). Individuals, particularly those with long work hours or family caregiving responsibilities, typically fit exercise and other activities they view as health promoting into their schedules after addressing these other tasks and responsibilities. Thus, both theory and evidence suggest that women are more likely than men to minimize or forgo such self-care in response to the competing demands on their time and energy.

Community Actions

In the constrained-choice model, "community" refers to both social networks of relationships with family, friends, and acquaintances at home and at work and the physical environment in which one lives. Thus one can imagine these communities distributed on a continuum from supportive to draining, negating the effects of stress or exacerbating them or enlarging or diminishing options of many types. These social and physical environments affect the ease or difficulty of men and women in meeting the demands of specific roles. However, the impact of living in a community at a given point along this continuum would on average differ somewhat for men versus women, as they are differentially exposed to and impacted by available resources and stressors. For example, as noted earlier, men and women differ in their exposure to specific daily stressors, which in turn affect their stress levels and responses due in part to gender differences in role activity and role expectations. At the community level, gender roles and responsibilities interact with resources and barriers such as employment opportunities or security, the provision of child care and elder care (both as givers and recipients of each), mass transit, and public safety.

The study of the impact of community or neighborhood on health is a rapidly growing transdisciplinary field of research. Yet research focused on assessing and explaining gender differences in the links between neighborhood factors and mortality is just emerging. For example, Grafova and colleagues (2008) found that economic and social environment aspects were important for men's risk of obesity, whereas aspects of the built environment were more important for women's. Similarly, Anderson and colleagues (1997) reported that the relationship between neighborhood socioeconomic status and mortality varied by age, gender, and race/ethnicity. Men and women typically live in the same neighborhoods, so unlike workplace effect, residential place effects are not related to gender segregation. Also, many studies have found gender differences in the link between neighborhood deprivation—an index generally based on unemployment, income, educational attainment, and utilization of public assistance—and health and mortality (Berke et al. 2007; Ross et al. 2007). Winkleby, Sundquist, and Cubbin (2007) found an association between higher neighborhood-level deprivation and both incident coronary heart disease and one-year case fatality for Swedish adults, with slightly stronger effects among women.

While such studies show that neighborhood effects contribute to gender differences in health, it remains unclear how neighborhood effects get under the skin. Men and women may differ in their physiological responses to particular neighborhood features partly through the possible impact on health behaviors. For example, Ross and colleagues (2007) found metropolitan sprawl was associated with higher body mass index (BMI) for men, but the effect was not significant for women. This finding may be explained by research showing that men and women use neighborhood features such as parks differently and that neighborhood walkability is more strongly associated with men's walking (Cohen et al. 2006; Morenoff and Sampson 1997). Other research has shown gender differences in how men and women incorporate social support and social networks. For men, such influences are often more place based. For women, place of residence may not be as strong an influence as work, family, and other social and role-related influences in their lives. Taken together, this work suggests that men's health behaviors may be more strongly affected by characteristics of their residential environment.

Social Policy

Finally, the constrained-choice framework includes the impact of social policy, including federal, state, and local government decisions and policies. To illustrate this at the federal level, we explored the proposition that different types of policy regimes formulate policies and regulations that directly and indirectly affect gender differences in health. We used cross-national differences in longevity and the gender gap in health behaviors to show how these policies could differentially increase the options and opportunities to for men and women to pursue health (see Bird and Rieker 2008, chapters 3 and 6). Obvious examples of social policies that affect health are universal day care, universal access to education, and retirement benefits not tied to employment or retirement benefits that affect continued employment. Such policies provide an economic safety net through a variety of public and private mechanisms and assure at least a minimum level of income and health-care access for a country's citizens. In addition, for a more general discussion emphasizing the value of integrating and the need to integrate medical sociology and social welfare theory, see Olafsdottir and Beckfield 2009.

These policies can have intended and unintended differential effects on men's and women's lives regardless of whether policy makers assume the genders are the same or different. However, the more critical issue is how much responsibility the state assumes for protective public health regulations and especially for family well-being and child care, and how much remains the responsibility of individuals and families. For example, in social democratic regimes such as the Nordic countries, where the state has more responsibility, both longevity and health status are better than in liberal regimes such as the United States and

Australia, where social policies rely on the market and where health care is tied to employment. Other examples concern antismoking and alcohol regulations enacted at the country or state level and the demonstrable effects these have had on declines in smoking rates and alcohol abuse (see Bird and Rieker 2008, chapter 6).

Consider also, for example, how in the United States the current recession has had a far greater effect on men's employment to date than on women's, due largely to the job losses in manufacturing (U.S. Department of Labor 2009a, b, c), resulting in the highest gender gap in unemployment in U.S. history (10 percent for men vs. 7.6 percent for women in April 2009). However, women are more highly represented in the part-time work force, which offers fewer benefits; thus a combination of recent economic trends and employment policies differentially affect men's and women's exposure to job and income loss and the related risk of loss of health insurance. Ironically perhaps, within families, higher rates of unemployment among men increase pressure on women to fill the role of breadwinner, despite their lower average incomes and differences in average work hours and benefits (Hartmann 2008; Lorber 1995; Risman 1998). Moreover as Heidi Hartmann (2008) noted in her congressional testimony on the impact of the current economic downturn on women: "A recession or weak job growth will only exacerbate the problems that face mothers who want and need to work but must find work that is compatible with their families' needs."

Loue (2008) notes that our cross-national comparison of health and economic indicators "underscores the irony of the position of the United States: even as we emphasize individual choice and responsibility for health, we fail as a nation to address and rectify the larger constraints that constitute barriers to opportunities and impediments to choice." Thus while our work to date has focused on the ways in which the social organization of men's and women's lives contributes to gender differences in health, our constrained-choice model clearly applies to racial/ethnic and socioeconomic health disparities as well. For example, differences in opportunities shape the trade-offs and choices made by racial and ethnic minorities—from where to live and what job to take, to who is responsible for caring for children and the elderly (Bird and Rieker 2008). Thus, we argue that the constrained-choice framework is also relevant to understanding and intervening on racial/ethnic disparities in health. An explanation of the complex link between gender and health behaviors cannot be complete without addressing the relationship of SES to healthy lifestyles and to health over the life course, but that broader discussion is beyond the scope of this chapter.

Future Research Questions and Issues to Consider

The idea that decisions and policies at multiple levels affect health is not new. Researchers, employers, public health officials, and policy makers use both implicit and explicit ecological models to understand and estimate the health effects of specific decisions and to identify individual, environmental, and population-based ways to reduce risk and unsafe behaviors. However, such models and health improvement efforts seldom focus on whether and how pathways and effects may differ by gender.

What do constrained-choice and gender-based analysis have to contribute to the study of health disparities and ultimately to population health? They can provide an understanding of how decisions made and actions taken at the family, work, community, and government levels differentially shape women's and men's health-related priorities, opportunities, and choices. This is not to suggest that individual health and behavior are fully determined by external forces, but that priorities and decisions beyond the level of the individual can reduce the latitude or sense of agency individuals have and the options they perceive in everyday life to pursue health. Clearly, many regulatory measures such as protecting and improving air quality and assuring a clean water supply or the safety of food and other products are largely beyond the reach of most individuals. Thus, we view constrained choice as a platform for prevention where the intention is to create a different kind of health consciousness, one that recognizes the role of differential gender constraints as an additional means for improving population health, both among individuals and decision makers at all levels. Moreover this model includes consideration of how racial/ethnic and socioeconomic constraints interact with sex and gender to produce health disparities among men and among women. As a research framework, it calls for transdisciplinary and comparative approaches at a variety of levels, and for studies that take into account the longer-term costs of policies that damage or undermine health, as well as the benefits of policies that foster health.

Recognizing the contributions to both individual and population health and to health disparities of decisions made at multiple levels beyond the individual raises key questions for researchers, clinicians, and policy makers. For example: Whose responsibility is health? Are protective measures, preventive behaviors, and the costs and consequences of poor health practices the province of individuals, families, the workplace, communities, states, or some combination of these? How such questions are answered has ramifications for improving population health and studying gender and health (see for example Walter and Neumann 2009 on how advances in gender sensitivity and analysis can affect health).

Other key questions seldom raised are: How can we measure the contribution of social, political, and economic policies to gender differences in health? How important are nonhealth policies for improving population health and preventing illness? How do we account for health-care access and quality within a constrained-choice framework (see Banks et al. 2006 and Schoeni et al. 2008 for an elaboration of some of these issues)? How do such policies interact with advances in biomedical science and technology to produce health? Although not focused on gender, others have been thinking about these topics as well. For example, Phelan and Link (2005) address the bidirectionality of biomedical processes and social phenomena in a way that resonates with our model. They argue that over the past century biomedical science and technology advances have made it possible for individuals to avoid some diseases and live longer, thereby transforming disease patterns and increasing human control over health. The added control makes understanding social factors even more important for improving population health through a "social shaping" approach (Link 2008). Link also notes that "when humans have control, it is their policies, their knowledge, and their behaviors that shape the consequences of biomedical accomplishments and thereby extant patterns of disease and death" (36).

We contend that constrained choice along with gender-based research can lead to better science. This approach provides an opportunity to explore biological and social pathways and mechanisms together as gender opens a window into biological processes, which is not the case with race/ethnicity and SES. However, if we start with gender and examine the intersectionalities with race/ethnicity and SES, then constrained choice can provide a glimpse of the pathways and mechanisms that create gendered health behaviors and outcomes (see Loue 2006 for a discussion of methods and measurement issues in such sex/gender research). Moreover there are a variety of ways and levels at which gender differences can be addressed. Briefly, research can be focused on: disease patterns; a specific disease or biological and genetic predispositions; health behaviors; comparative social regimes and health status; employment patterns; differential stress exposure and responses; and social networks. These topics can be studied as variations within a country, as cross-national comparisons, or as some combination of these.

Research such as what we are advocating is already under way. There is considerable momentum to include both biological and social factors in health studies, a trend observable in both research and policy domains where gender-based analysis is promoted (see for example Fausto-Sterling 2008, 2005; Johnson, Greaves, and Repta 2007, 2009; Klinge 2007; Lohan 2007; Spitzer 2005). These efforts will substantially advance understanding of the biological and social circumstances and identify pathways and mechanisms that expose men and women to harmful stress levels or that place them at risk for adopting unsafe health behaviors that contribute to differential outcomes. Pescosolido and colleagues' (2008) analysis of the intersecting biological and social pathways to gender differences in alcohol dependence provides one very promising example. These authors not only examine the genetic and social interaction empirically but also address the implications of the findings for sociological theories. Extending this thinking to gender-based analysis and theories would advance our knowledge of these phenomena.

If sociologists seek to improve population health and reduce health disparities by influencing the broad range of decisions that occur beyond the level of the individual but affect opportunities to pursue a healthy life, there is much work to be done. The next phase of gender and health comparison work should include the application of the constrained-choice framework to various research agendas. Decision makers at all levels need actionable evidence from gender-focused, generalizable studies on the health benefits or costs of specific choices and policies. This approach requires analyses of the health effects of particular policies that provide clear directives for action beyond the provision of and access to health care. For example, where work to date has typically sought to capture the short-term, and in some cases longer-term, economic costs of policies as diverse as education, employment, and transportation, constrained choice suggests that assessing and reporting the probable health impacts would allow policy makers to take population health effects into account and to value health in considering the trade-offs among policy options (Schoeni et al. 2008). In a society where future prosperity depends on the health and well-being of the population, researchers have tremendous new opportunities to inform policy decisions and a responsibility to take into account whether and how specific policies will affect population health. Attention to the differences in men's and women's lives can further assure that policies will not inadvertently exacerbate these differences or contribute to health disparities among men or among women.

Notes

1. The *Canadian Medical Association Journal* devoted a special issue (March 13, 2007) to the knowledge gap in understanding the sex-specific differences in the epidemiology of CVD. For example, in one article Pilote and colleagues (2007) conclude that the knowledge gap might explain why cardiovascular health is not improving as rapidly among women as it is in men, and that the regional/country gender differences in CVD incidence may result from an interaction between sex- and gender-related factors.
2. Although both combat duty and exposure to sexual abuse are PTSD risk factors for both men and women, their exposure rates differ by gender. However, women's increasing presence in combat roles and a growing recognition of the prevalence of sexual abuse of boys by clergy members may be narrowing these long-standing differences.

References

Abramowicz, Mark, and Henry L. Barnett. 1970. "Sex Ratio of Infant Mortality." *American Journal of Diseases of Children* 119(4): 314–15.

Anderson, Roger T., Paul Sorlie, Eric Backlund, Norman Johnson, and George A. Kaplan. 1997. "Mortality Effects of Community Socioeconomic Status." *Epidemiology* 8(1): 42–47.

Andoh, S. Y., M. Umezaki, K. Nakamura, M. Kizuki, and Takehito Takano. 2006. "Correlation between National Income, HIV/AIDS and Political Status and Mortalities in African Countries." *Public Health* 120(7): 624–33.

Aneshensel, Carol S. 1985. "The Natural History of Depressive Symptoms." *Research in Community and Mental Health* 5:45–74.

Annandale, Ellen. 2009. *Women's Health and Social Change*. London: Routledge.

Banks, James, Michael Marmot, Zoe Oldfield, and James P. Smith. 2006. "Disease and Disadvantage in the United States and in England." *Journal of the American Medical Association* 295(17): 2037–45.

Bassuk, Shari S., and JoAnn E. Manson. 2004. "Gender and Its Impact on Risk Factors for Cardiovascular Disease." In *Principles of Gender Specific Medicine*, ed. M. J. Legato, 193–213. London: Elsevier Academic Press.

Bebbington, Paul. 1996. "The Origins of Sex Differences in Depressive Disorder: Bridging the Gap." *International Review of Psychiatry* 8(4): 295–332.

Begg, Lisa, and Christopher E. Taylor. 2006. "Regulation of Inflammatory Responses: Influence of Sex and Gender: Workshop Summary." In *NIH Workshop: Regulation of Inflammatory Responses: Influence of Sex and Gender*. Bethesda, Md.: Office of Research on Women's Health.

Berin, Barnet N., George L. Stolnitz, and Aaron Tenenbein. 1989. "Mortality Trends of Males and Females over the Ages." *Transactions of Society of Actuaries* 41(1): 9–32.

Berke, Ethan M., Laura M. Gottlieb, Anne V. Moudon, and Eric B. Larson. 2007. "Protective Association between Neighborhood Walkability and Depression in Older Men." *Journal of the American Geriatrics Society* 55(4): 526–33.

Bird, Chloe E., and Patricia P. Rieker. 2008. *Gender and Health: The Effects of Constrained Choices and Social Policies*. New York: Cambridge University Press.

Cameron, Elaine, and Jon Bernardes. 1998. "Gender and Disadvantage in Health: Men's Health for a Change." *Sociology of Health and Illness* 20(5): 673–93.

Chino, Allan F., and Dean Funabaki. 1984. "A Cross-Validation of Sex Differences in the Expression of Depression." *Sex Roles* 11(3–4): 175–87.

Chodorow, Nancy J. 1978. *The Reproduction of Mothering*. Berkeley: University of California Press.

Cleary, Paul D., David Mechanic, and James R. Greenly. 1982. "Sex Differences in Medical Care Utilization: An Empirical Investigation." *Journal of Health and Social Behavior* 23(2): 106–19.

Cohen, Deborah A., Amber Sehgal, Stephanie Williamson, Ronald Sturm, Thomas L. McKenzie, Rosa Lara, and Nicole Lurie. 2006. "Park Use and Physical Activity in a Sample of Public Parks in the City of Los Angeles." Santa Monica, Calif.: RAND Corporation.

Connell, Robert W. 1987. *Gender and Power*. Stanford, Calif.: Stanford University Press.

Courtenay, Will H. 2000a. "Behavioral Factors Associated with Disease, Injury, and Death among Men: Evidence and Implications for Prevention." *Journal of Men's Studies* 9(1): 81–142.

———. 2000b. "Constructions of Masculinity and Their Influence on Men's Well-Being: A Theory of Gender and Health." *Social Science and Medicine* 50(10): 1385–1401.

Crimmins, Eileen M., Jung K. Kim, and Aaron Hagedorn. 2002. "Life with and without Disease: Women Experience More of Both." *Journal of Women and Aging* 14(1–2): 47–59.

Dedovic, Katarina, Mehereen Wadiwalla, Veronica Engert, and Jens C. Pruessner. 2009. "The Role of Sex and Gender Socialization in Stress Reactivity." *Developmental Psychology* 45(1): 45–55.

Dohrenwend, Bruce P., and Barbara S. Dohrenwend. 1976. "Sex Differences and Psychiatric Disorders." *American Journal of Sociology* 81(6): 1147–54.

———. 1977. "Reply to Gove and Tudor's Comment on 'Sex Differences and Psychiatric Disorders.'" *American Journal of Sociology* 82(6): 1336–45.

Dworkin, Shari L. 2001. "'Holding Back': Negotiating a Glass Ceiling on Women's Strength." *Sociological Perspectives* 44(3): 333–50.

Dworkin, Shari L., and Michael A. Messner. 1999. "Just Do What? Sport, Bodies, Gender." In *Revisioning Gender*, ed. M. M. Ferree, J. Lorber, and B. B. Hess, 341–61. Thousand Oaks, Calif.: Sage Publications.

Dworkin, Shari L., and Faye L. Wachs. 2009. *Body Panic: Gender, Health, and the Selling of Fitness*. New York: New York University Press.

Endicott, Jean. 1998. "Gender Similarities and Differences in the Course of Depression." *Journal of Gender-Specific Medicine* 1(3): 40–43.

Ernst, Cecille, and Jules Angst. 1992. "The Zurich Study, XII: Sex Differences in Depression: Evidence from Longitudinal Epidemiological Data." *European Archives of Psychiatry and Clinical Neuroscience* 241(4): 222–30.

Fausto-Sterling, Anne. 2005. "The Bare Bones of Sex: Part 1—Sex and Gender." *Signs* 30(5): 1491–1526.

———. 2008. "The Bare Bones of Race." *Social Studies of Science* 38(5): 657–94.

Gove, Walter R., and Jeannette F. Tudor. 1973. "Adult Sex Roles and Mental Illness." *American Journal of Sociology* 78(4): 812–35.

Grafova, Irina B., Vicki A. Freedman, Rizie Kumar, and Jeannette Rogowski. 2008. "Neighborhoods and Obesity in Later Life." *American Journal of Public Health* 98(11): 2065–71.

Gregory, Tanya, and Jean Endicott. 1999. "Understanding Depression in Women." *Patient Care* 33(19): 19–20.

Grundtvig, Morten, Terje P. Hagen, Mikael German, and Asmund Reikvam. 2009. "Sex-Based Differences in Premature First Myocardial Infarction Caused by Smoking: Twice as Many Years Lost by Women as Men." *European Journal of Cardiovascular Prevention and Rehabilitation* 16(2): 174–79.

Harrison, James. 1978. "Warning: The Male Sex Role May Be Dangerous to Your Health." *Journal of Social Issues* 34(1): 65–86.

Hartmann, Heidi. 2008. "The Impact of the Current Economic Downturn on Women (Testimony Presented to the Joint Economic Committee)." Washington, D.C.: Institute for Women's Policy Research.

Hunt, Kate, and Ellen Annandale. 1999. "Relocating Gender and Morbidity: Examining Men's and Women's Health in Contemporary Western Societies. Introduction to Special Issue on Gender and Health." *Social Science and Medicine* 48(1): 1–5.

Institute of Medicine. 2001a. *Exploring the Biological Contributions to Human Health: Does Sex Matter?* ed. T. M. Wizemann and M. L. Pardue. Washington, D.C.: National Academies Press.

———. 2001b. *Health and Behavior: The Interplay of Biological, Behavioral and Societal Influences*. Washington, D.C.: National Academies Press.

Jacobson, Denise L., Stephen J. Gange, Noel R. Rose, and Neil M. Graham. 1997. “Epidemiology and Estimated Population Burden of Selected Autoimmune Diseases in the United States.” *Clinical Immunology and Immunopathology* 84(3): 223–43.

James, Cara V., Alina Salganicoff, Megan Thomas, Usha Ranji, Marsha Lillie-Blanton, and Roberta Wyn. 2009. *Putting Women's Health Care Disparities on the Map: Examining Racial and Ethnic Disparities at the State Level*. Menlo Park, Calif.: Henry J. Kaiser Family Foundation.

Jaycox, Lisa H. 2008. “Invisible Wounds of War: Summary of Key Findings on Psychological and Cognitive Injuries.” Santa Monica, Calif.: RAND Corporation.

Johnson, Joy L., Lorraine Greaves, and Robin Repta. 2007. *Better Science with Sex and Gender: A Primer for Health Research*. Vancouver, B.C.: Women's Health Research Network.

———. 2009. “Better Science with Sex and Gender: Facilitating the Use of a Sex and Gender-Based Analysis in Health Research.” *International Journal for Equity in Health* 8(1): 14.

Kalben, Barbara B. 2002. *Why Men Die Younger: Causes of Mortality Differences by Sex*. SOA Monograph M-L101–1. Schamburg, Ill.: Society of Actuaries.

Kandel, Denise B., Lynn A. Warner, and Ronald C. Kessler. 1998. “The Epidemiology of Substance Use and Dependence among Women.” In *Drug Addiction Research and the Health of Women*, ed. C. L. Wetherington and A. B. Roman, 105–30. NIDA Research Monograph. Rockville, Md.: National Institute of Drug Abuse.

Kannel, William B., and Peter W. Wilson. 1995. “Risk Factors That Attenuate the Female Coronary Disease Advantage.” *Archives of Internal Medicine* 155(1): 57–61.

Kawachi, Ichiro, and Bruce Kennedy. 2006. *The Health of Nations: Why Inequality Is Harmful to Your Health*. New York: New Press.

Keitner, Gabor I., Christine E. Ryan, Ivan W. Miller, Robert Kohn, and Nathan B. Epstein. 1991. “12-Month Outcome of Patients with Major Depression and Comorbid Psychiatric or Medical Illness (Compound Depression).” *American Journal of Psychiatry* 148(3): 345–50.

Kessler, Ronald C., Peggy R. Barker, Lisa J. Colpe, Joan F. Epstein, Joseph C. Gfroerer, Eva Hiripi, Mary J. Howes, Sharon-Lise T. Normand, Ronald W. Manderscheid, Ellen E. Walters, and Alan M. Zaslavsky. 2003. “Screening for Serious Mental Illness in the General Population.” *Archives of General Psychiatry* 60(2): 184–89.

Kessler, Ronald C., Patricia Berglund, Olga Demler, Robert Jin, Doreen Koretz, Kathleen R. Merikangas, A. John Rush, Ellen E. Walters, and Philip Wang. 2003. “The Epidemiology of Major Depressive Disorder: Results from the National Comorbidity Survey Replication (Ncs-R).” *Journal of the American Medical Association* 289(23): 3095–3105.

Kessler, Ronald C., Rosa M. Crum, Lynn A. Warner, Christopher B. Nelson, John Schulenberg, and James C. Anthony. 1997. “Lifetime Co-Occurrence of DSM-III-R Alcohol Abuse and Dependence with Other Psychiatric Disorders in the National Comorbidity Survey.” *Archives of General Psychiatry* 54(4): 313–21.

Kessler, Ronald C., Katherine A. McGonagle, Marvin Swartz, Dan G. Blazer, and Christopher B. Nelson. 1993. “Sex and Depression in the National Comorbidity Survey 1: Lifetime Prevalence, Chronicity and Recurrence.” *Journal of Affective Disorders* 29(2–3): 85–96.

Kessler, Ronald C., Katherine A. McGonagle, Shanyang Zhao, Christopher B. Nelson, Michael Hughes, Suzann Eshleman, Hans-Ulrich Wittchen, and Kenneth S. Kendler. 1994. “Lifetime and 12-Month Prevalence of DSM-III-R Psychiatric Disorders in the United States: Results from the National Comorbidity Survey.” *Archives of General Psychiatry* 51(1): 8–19.

Kessler, Ronald C., Christopher B. Nelson, Katherine A. McGonagle, J. Liu, Marvin Swartz, and Dan G. Blazer. 1996. “Comorbidity of DSM-III-R Major Depressive Disorder in the General Population: Results from the U.S. National Comorbidity Survey.” *British Journal of Psychiatry* 168, suppl. 30:17–30.

Kessler, Ronald C., and Ellen E. Walters. 2002. “The National Comorbidity Survey.” In *Textbook in Psychiatric Epidemiology*, ed. M. T. Tsuang and M. Tohen, 243–62. New York: John Wiley and Sons.

Kiecolt-Glaser, Janice K., Lynanne McGuire, Theodore F. Robles, and Ronald Glaser. 2002a. “Emotions, Morbidity, and Mortality: New Perspectives from Psychoneuroimmunology.” *Annual Review of Psychology* 53:83–107.

———. 2002b. “Psychoneuroimmunology: Psychological Influences on Immune Function and Health.” *Journal of Consulting and Clinical Psychology* 70(3): 537–47.

Kimmel, Michael S., and Michael A. Messner. 1993. *Men's Lives*. New York: Macmillan.

Klinge, Ineke. 2007. “Bringing Gender Expertise to Biomedical and Health-Related Research.” *Gender Medicine* 4, suppl. 2:S59–63.

Kornstein, Susan G., Alan F. Schatzberg, Michael E. Thase, Kimberly A. Yonkers, James P. McCullough, Gabor I. Keitner, Alan J. Gelenberg, C. E. Ryan, A. L. Hess, Wilma Harrison, Sonia M. Davis, and

Martin B. Keller. 2000. "Gender Differences in Chronic Major and Double Depression." *Journal of Affective Disorders* 60(1): 1–11.

Krieger, Nancy. 2003. "Genders, Sexes, and Health: What Are the Connections—and Why Does It Matter?" *International Journal of Epidemiology* 32(4): 652–57.

Krieger, Nancy, David H. Rehkopf, Jarvis T. Chen, Pamela D. Waterman, Enrico Marcelli, and Malinda Kennedy. 2008. "The Fall and Rise of U.S. Inequalities in Premature Mortality: 1960–2002." *PLoS Medicine* 5(2): e46.

Legato, Marianne J. 2002. *Eve's Rib: The Groundbreaking Guide to Women's Health*. New York: Three Rivers Press.

Lennon, Mary C. 2006. "Women, Work and Depression: Conceptual and Policy Issues." In *The Handbook for the Study of Women and Depression*, ed. C. L. M. Keyes and S. H. Goodman, 309–27. New York: Cambridge University Press.

Levant, Ronald F. and William S. Pollack. 1995. *A New Psychology of Men*. New York: Basic Books.

Link, Bruce G. 2008. "Epidemiological Sociology and the Social Shaping of Population Health." *Journal of Health and Social Behavior* 49(4): 367–84.

Lockshin, Michael D. 2001. "Genome and Hormones: Gender Differences in Physiology: Invited Review: Sex Ratio and Rheumatic Disease." *Journal of Applied Physiology* 91(5): 2366–73.

———. 2006. "Sex Differences in Autoimmune Disease." *Lupus* 15(11): 753–56.

———. Forthcoming. "Non-Hormonal Explanations for Sex Discrepancy in Human Illness."

Lockshin, Michael D., Sherine Gabriel, Zahra Zakeri, and Richard A. Lockshin. 1999. "Gender, Biology and Human Disease: Report of a Conference." *Lupus* 8(5): 335–38.

Lohan, Maria. 2007. "How Might We Understand Men's Health Better? Integrating Explanations from Critical Studies on Men and Inequalities in Health." *Social Science and Medicine* 65(3): 495–504.

Lorber, Judith. 1995. *Paradoxes of Gender*. New Haven, Conn.: Yale University Press.

Loue, Sana. 2006. *Assessing Race, Ethnicity and Gender in Health*. New York: Springer.

———. 2008. "Gender and Health: The Effects of Constrained Choices and Social Policies." *New England Journal of Medicine* 359(11): 1187.

Lutfey, Karen, and Jeremy Freese. 2005. "Toward Some Fundamentals of Fundamental Causality: Socioeconomic Status and Health in the Routine Clinic Visit for Diabetes." *American Journal of Sociology* 110(5): 1326–72.

Marmot, Michael. 2004. *The Status Syndrome: How Social Standing Affects Our Health and Longevity*. New York: Henry Holt.

———. 2005. "Social Determinants of Health Inequalities." *Lancet* 365(9464): 1099–1104.

Mirowsky, J., and K. Ross. 2003. *Education, Social Status, and Health*. Hawthorne, N.Y.: Aldine De Gruyter.

Morenoff, Jeffrey D., and Robert J. Sampson. 1997. "Violent Crime and the Spatial Dynamics of Neighborhood Transition: Chicago, 1970–1990." *Social Forces* 76(1): 31–64.

Murray, Christopher J., Sandeep C. Kulkarni, Catherine Michaud, Niels Tomijima, Maria T. Bulzacchelli, Terrell J. Iandiorio, and Majid Ezzati. 2006. "Eight Americas: Investigating Mortality Disparities across Races, Counties and Race-Counties in the United States." *PLoS Medicine* 3(9): e260.

Narrow, William E., Donald S. Rae, Lee N. Robins, and Darrel A. Regier. 2002. "Revised Prevalence Estimates of Mental Disorders in the United States." *Archives of General Psychiatry* 59(2): 115–130.

Nathanson, Constance A. 1984. "Sex Differences in Mortality." *Annual Review of Sociology* 10:191–213.

National Center for Health Statistics (NCHS). 2009. *Health, United States, 2008, with Chartbook*. Hyattsville, Md.: NCHS.

Nazroo, James Y., Angela C. Edwards, and George W. Brown. 1998. "Gender Differences in the Prevalence of Depression: Artefact, Alternative Disorders, Biology or Roles?" *Sociology of Health and Illness* 20(3): 312–30.

Nolen-Hoeksema, Susan. 1987. "Sex Differences in Unipolar Depression: Evidence and Theory." *Psychological Bulletin* 101(2): 259–82.

———. 1990. *Sex Differences in Depression*. Stanford, Calif.: Stanford University Press.

O'Connor, Daryl B., Mark T. Conner, and Fiona Jones. 2005. "Effects of Stress on Eating Behaviour: An Integrated Approach." Swindon, UK: Economic and Social Research Council.

Olafsdottir, Sigrun, and Jason Beckfield. 2009. "Health and the Social Rights of Citizenship: Integrating Welfare State Theory and Medical Sociology." In *Handbook of Sociology of Health, Illness, and Healing*, ed. B. A. Pescosolido, J. K. Martin, J. D. McLeod, and A. Rogers. New York: Springer.

Pai, Jennifer K., Tobias Pischon, Jing Ma, JoAnn E. Manson, Susan E. Hankinson, Kaumudi Joshipura, Gary C. Curhan, Nader Rifai, Carolyn C. Cannuscio, Meir J. Stampfer, and Eric B. Rimm. 2004. "Inflammatory Markers and the Risk of Coronary Heart Disease in Men and Women." *New England Journal of Medicine* 351(25): 2599–2610.

Pescosolido, Bernice A., Brea L. Perry, J. Scott Long, Jack K. Martin, John I. Nurnberger Jr., and

Victor Hesselbrock. 2008. "Under the Influence of Genetics: How Transdisciplinarity Leads Us to Rethink Social Pathways to Illness." *American Journal of Sociology* 114, suppl. 1:S171–201.

Phelan, Jo C., Bruce G. Link, Ana Diez-Roux, Ichiro Kawachi, and Bruce Levin. 2004. "'Fundamental Causes' of Social Inequalities in Mortality: A Test of the Theory." *Journal of Health and Social Behavior* 45(3): 265–85.

Phelan, Jo C., and Bruce G. Link. 2005. "Controlling Disease and Creating Disparities: A Fundamental Cause Perspective." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 60(2): S27–33.

Piccinelli, Marco, and Greg Wilkinson. 2000. "Gender Differences in Depression: Critical Review." *British Journal of Psychiatry* 177:486–92.

Pilote, Louise, Kaberi Dasgupta, Veena Guru, Karin H. Humphries, Jennifer McGrath, Colleen Norris, Doreen Rabi, Johanne Tremblay, Arsham Alamian, Tracie Barnett, Jafna Cox, William A. Ghali, Sherry Grace, Pavel Hamet, Teresa Ho, Susan Kirkland, Marie Lambert, Danielle Libersan, Jennifer O'Loughlin, Gilles Paradis, Milan Petrovich, and Vicky Tagalakis. 2007. "A Comprehensive View of Sex-Specific Issues Related to Cardiovascular Disease." *Canadian Medical Association Journal* 176(6): S1–44.

Pinnelli, Antonella. 1997. "Gender and Demography." In *Démographie: Analyse et synthèse: Causes et conséquences des évolutions démographiques: Actes du Séminaire "Population et démographie: Problèmes et politiques."* San Miniato. Vol 1. Rome: Universita' La Sapienza, Dipartimento di Scienze.

Pleck, Joseph H. 1983. *The Myth of Masculinity*. Cambridge, Mass.: MIT Press.

———. 1984. "Men's Power with Women, Other Men, and Society: A Men's Movement Analysis." In *The Gender Gap in Psychotherapy: Social Realities in Psychological Processes*, ed. P. P. Rieker and E. H. Carmen, 79–90. New York: Plenum Press.

Pleck, Joseph H., and Robert Brannon. 1978. "Male Roles and the Male Experience: Introduction." *Journal of Social Issues* 34(1): 1–4.

Pratt, Laura A. 2009. "Serious Psychological Distress, as Measured by the K6, and Mortality." *Annals of Epidemiology* 19(3): 202–9.

Ramey, Estelle R. 1982. "The Natural Capacity for Health in Women." In *Women: A Developmental Perspective*, ed. P. W. Berman and E. R. Ramey, 3–12. NIH Publication No. 82–2298. Washington, D.C.: U.S. Department of Health and Human Services.

Rao, Chalapati, Alan D. Lopez, and Yusuf Hemed. 2006. "Causes of Death." In *Disease and Mortality in Sub-Saharan Africa*, 2d ed., ed. D. T. Jamison, R. G. Feachem, M. W. Makgoba, E. R. Bos, F. K. Baingana, K. J. Hofman, and K. O. Rogo, 43–58. Washington, D.C.: World Bank Publications.

Reeves, Mathew J., and Ann P. Rafferty. 2005. "Healthy Lifestyle Characteristics among Adults in the United States, 2000." *Archives of Internal Medicine* 165(8): 854–57.

Regier, Darrel A., William E. Narrow, Donald S. Rae, Ronald W. Manderscheid, B. Z. Locke, and F. K. Goodwin. 1993. "The De Facto U.S. Mental and Addictive Disorders Service System: Epidemiological Catchment Area 1-Year Prevalence Rates of Disorders and Services." *Archives of General Psychiatry* 50(2): 85–94.

Regier, Darrel A., and Lee N. Robins. 1991. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: Free Press.

Rhodes, Anne E., Paula N. Goering, Teresa To, and J. Ivan Williams. 2002. "Gender and Outpatient Mental Health Service Use." *Social Science and Medicine* 54(1): 1–10.

Ridgeway, Cecilia L., and Lynn Smith-Lovin. 1999. "The Gender System and Interaction." *Annual Review of Sociology* 25:191–216.

Rieker, Patricia P., and Chloe E. Bird. 2000. "Sociological Explanations of Gender Differences in Mental and Physical Health." In *The Handbook of Medical Sociology*, 5th ed., ed. C. E. Bird, P. Conrad, and A. M. Fremont, 98–113. Englewood Cliffs, N.J.: Prentice Hall.

———. 2005. "Rethinking Gender Differences in Health: Why We Need to Integrate Social and Biological Perspectives." *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 60(2): S40–47.

Rieker, Patricia P., and Elaine H. Carmen. 1984. *The Gender Gap in Psychotherapy: Social Realities in Psychological Processes*. New York: Plenum Press.

Risman, Barbara J. 1998. *Gender Vertigo: American Families in Transition*. New Haven, Conn.: Yale University Press.

Rosenfield, Sarah. 1999. "Gender and Mental Health: Do Women Have More Psychopathology, Men More, or Both the Same (and Why)?" In *The Sociology of Mental Health and Illness*, ed. A. Horwitz and T. Sheid, 348–60. New York: Cambridge University Press.

Ross, Nancy A., Stephane Tremblay, Saeeda Khan, Daniel Crouse, Mark Tremblay, and Jean-Marie Berthelot. 2007. "Body Mass Index in Urban Canada: Neighborhood and Metropolitan Area Effects." *American Journal of Public Health* 97(3): 500–508.

Rustgi, Sheila D., Michelle M. Doty, and Sara R.

Collins. 2009. *Women at Risk: Why Many Women Are Forgoing Needed Health Care—Analysis from the Commonwealth Fund 2007; Biennial Health Insurance Survey*. New York: Commonwealth Fund.

Sabo, Don, and David F. Gordon. 1995. "Rethinking Men's Health and Illness." In *Men's Health and Illness: Gender, Power and the Body*, ed. D. Sabo and D. F. Gordon, 1–21. Thousand Oaks, Calif.: Sage.

Sargeant, J. Kent, Martha L. Bruce, Louis P. Florio, and Myrna M. Weissman. 1990. "Factors Associated with 1-Year Outcome of Major Depression in the Community." *Archives of General Psychiatry* 47(6): 519–26.

Schoeni, Robert F., James S. House, George A. Kaplan, and Harold Pollack. 2008. *Making Americans Healthier: Social and Economic Policy as Health Policy*. New York: Russell Sage Foundation.

Selye, Hans. 1956. *The Stress of Life*. New York: McGraw-Hall.

Shetty, Kanaka D., William B. Vogt, and Jayanta Bhattacharya. 2009. "Hormone Replacement Therapy and Cardiovascular Health in the United States." *Medical Care* 47(5): 600–606.

Sowers, James R. 1998. "Diabetes Mellitus and Cardiovascular Disease in Women." *Archives of Internal Medicine* 158(6): 617–21.

Spitzer, Denise. 2005. "Engendering Health Disparities (Commentary)." *Canadian Journal of Public Health* 96, suppl. 2: S78–S96.

Taylor, Shelley E., Laura C. Klein, Brian P. Lewis, Tara L. Gruenewald, Regan A. Gurung, and John A. Updegraff. 2000. "Biobehavioral Responses to Stress in Females: Tend-and-Befriend, Not Fight-or-Flight." *Psychological Review* 107(3): 411–29.

Theorell, Tores, and Robert A. Karasek. 1996. "Current Issues Relating to Psychosocial Job Strain and Cardiovascular Disease Research." *Journal of Occupational Health Psychology* 1(1): 9–26.

Thom, Thomas, Nancy Haase, Wayne Rosamond, Virginia J. Howard, John Rumsfeld, Teri Manolio, Zhi-Jie Zheng, Katherine Flegal, Christopher O'Donnell, Steven Kittner, Donald Lloyd-Jones, David C. Goff Jr., Yuling Hong, Robert Adams, Gary Friday, Karen Furie, Philip Gorelick, Brett Kissela, John Marler, James Meigs, Veronique Roger, Stephen Sidney, Paul Sorlie, Julia Steinberger, Sylvia Wasserthiel-Smoller, Matthew Wilson, Philip Wolf, and American Heart Association Statistics Committee and Stroke Statistics Subcommittee. 2006. "Heart Disease and Stroke Statistics—2006 Update: A Report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee." *Circulation* 113(6): e85–151.

Thorand, Barbara, Jens Baumert, Hubert Kolb, Christa Meisinger, Lloyd Chambless, Wolfgang Koenig, and Christian Herder. 2007. "Sex Differences in the Prediction of Type 2 Diabetes by Inflammatory Markers: Results from the Monica/Kora Augsburg Case-Cohort Study, 1984–2002." *Diabetes Care* 30(4): 854–60.

United Nations. 2005. "The World's Women 2005: Trends and Statistics." New York: United Nations.

U.S. Department of Labor. Bureau of Labor Statistics. 2009a. "Employed Persons by Occupation, Sex, and Age." May 29. bls.gov/cps/cpsaat9.pdf.

———. 2009b. "Extended Mass Layoffs." May 29. bls.gov/news.release/pdf/mslo.pdf.

———. 2009c. "News: The Employment Situation; April 2009." May 29. bls.gov/news.release/pdf/empsit.pdf.

Velkoff, Victoria A., and Paul R. Kowal. 2007. *Current Population Reports, P95/07–1 Population Aging in Sub-Saharan Africa: Demographic Dimensions 2006*. Washington, D.C.: U.S. Department of Health and Human Services, U.S. Department of Commerce.

Verbrugge, Lois M., and Deborah L. Wingard. 1987. "Sex Differentials in Health and Mortality." *Women and Health* 12(2): 103–45.

Waldron, Ingrid. 1998. "Sex Differences in Infant and Early Childhood Mortality: Major Causes of Death and Possible Biological Causes." In *Too Young to Die: Genes or Gender?* Department of Economic and Social Affairs, Population Division, 64–83. New York: United Nations.

Walsh, Stephen J., and Laurie M. Rau. 2000. "Autoimmune Diseases: A Leading Cause of Death among Young and Middle-Aged Women in the United States." *American Journal of Public Health* 90(9): 1463–66.

Walter, Ulla, and Brigitte Neumann. 2009. *Gender in Prevention and Health Promotion: Policy Research Practice*. New York: Springer.

West, Candace, and Don H. Zimmerman. 1987. "Doing Gender." *Gender and Society* 1(2): 125–51.

Whang, William, Laura D. Kubzansky, Ichiro Kawachi, Kathryn M. Rexrode, Candyce H. Kroenke, Robert J. Glynn, Hasan Garan, and Christine M. Albert. 2009. "Depression and Risk of Sudden Cardiac Death and Coronary Heart Disease in Women: Results from the Nurses' Health Study." *Journal of the American College of Cardiology* 53(11): 950–58.

Whooley, Mary A., Peter de Jonge, Eric Vittinghoff, Christian Otte, Rudolf Moos, Robert M. Carney, Sadia Ali, Sunaina Dowray, Beeya Na, Mitchell D. Feldman, Nelson B. Schiller, and Warren S. Browner. 2008. "Depressive Symptoms, Health Behaviors, and Risk of Cardiovascular Events in Patients with Coronary Heart Disease." *Journal of the American Medical Association* 300(20): 2379–88.

Wilhelm, Kay, Gordon Parker, and Dusan Hadzi-Pavlovic. 1997. "Fifteen Years On: Evolving Ideas in Researching Sex Differences in Depression." *Psychological Medicine* 27(4): 875–83.
Wilkinson, Richard. 1996. *Unhealthy Societies: The Afflictions of Inequality*. London: Routledge.
Wingard, Deborah L. 1984. "The Sex Differential in Morbidity, Mortality, and Lifestyle." *Annual Review of Public Health* 5:433–58.
Winkleby, Marilyn, Kristina Sundquist, and Catherine Cubbin. 2007. "Inequities in CHD Incidence and Case Fatality by Neighborhood Deprivation." *American Journal of Preventive Medicine* 32(2): 97–106.
Winokur, George, William Coryell, Martin Keller, Jean Endicott, and Hagop Akiskal. 1993. "A Prospective Follow-Up of Patients with Bipolar and Primary Unipolar Affective Disorder." *Archives of General Psychiatry* 50(6): 457–65.
WHO [World Health Organization]. 2002. "The World Health Report: Reducing Risks, Promoting Healthy Life." Geneva: World Health Organization.
———. 2006. "World Health Statistics 2006." February 18. who.int/whosis/whostat2006.pdf.
———. 2008. "Primary Health Care: Now More Than Ever." May 29. who.int/whr/2008/summary/en/index.html.
Yin, Sandra. 2007. "Gender Disparities in Health and Mortality 2007. Population Reference Bureau." February 16. prb.org/Articles/2007/genderdisparities.aspx?p=1.