WOMEN'S HEALTH AND HEALTH CARE REFORM

The Economic Burden of Disease in Women

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Executive Summary

As America considers ways to reform its health care system, a central focus must be the fact that women need and use the health care system more than men. Women's reproductive health care needs are part of the reason for increased use, but more women than men also suffer from one or more chronic conditions that require ongoing care, such as diabetes, depression, heart disease, and osteoporosis.

Earlier this year, the Mailman School of Public Health at Columbia University released a report, *Women's Health and Health Care Reform: The Key Role of Comprehensive Reproductive Health Care.* That study makes a scientific, data-driven case for a comprehensive standard of health for American women— affordable and stable coverage that enables women to **attain good health in childhood and adolescence, maintain good health during their reproductive years, and age well.** The report also calls for significant preventive and public health investment. The report's recommendations have been endorsed by 38 of the nation's 50 Deans of Schools of Public Health.

Our report, a companion to the Columbia report, was prepared by the Jacobs Institute of Women's Health at The George Washington University School of Public Health and Health Services, and made possible by the Women Donors Network and the Communications Consortium Media Center. It underscores the key roles of both preventive care and continuity of care for women across the lifespan, including primary and specialty care as well as pregnancy care. Further, this report demonstrates that providing continuity of care for women's health would not only result in better health for women, but also may yield cost savings for the U.S. health care system as a whole.

We estimate the direct and indirect costs of care for women for the major chronic diseases and conditions that women face across the lifespan. We also identify the key primary care and preventive services that can lead to prevention, early detection or early intervention for these conditions.

Health care screening, counseling, early diagnosis, and early intervention health care services are important for women at each stage of their lives. But women typically seek care in primary care settings for family planning services and cancer screening prior to becoming pregnant. As a result, high quality care during the reproductive years offers an important opportunity to identify risk factors and health conditions and to provide appropriate interventions and quality care.

Primary and preventive care standards also underscore that screening for cancer, risks for heart disease, family planning services and detection of violence, as well as smoking cessation and nutrition counseling, should begin during the reproductive years. A healthy pregnancy, leading to the best outcome for both mother and child, begins when the woman is in the best possible health prior to conception. Counseling on obesity prevention and smoking cessation are vital prior to pregnancy; delaying counseling until after conception compromises a woman's ability to achieve the best outcomes. Identification of hypertension and/or gestational diabetes in pregnancy provides an opportunity to identify women at higher risk of heart disease and diabetes later in life.

Early care is particularly important for women who are members of racial and ethnic minority groups. Approximately one in every three residents of the United States self-identifies as African-American, American Indian/Alaska Native, Asian/Pacific-American, or Latino. Disparities in health status are closely associated with race and ethnicity – in health insurance coverage, psychosocial stress, discrimination and health care access and quality, and in deaths due to breast cancer and pregnancy-related causes.

Our analysis shows that in 2009:

- The direct costs of *cardiovascular disease*, which affects 43 million U.S. women, are estimated at $162 billion a year.

- Direct and indirect costs of *depression* for both women and men are estimated at over $100 billion, with direct medical costs for depression in women alone estimated to be over $20 billion.

- The direct medical costs alone of *osteoporosis*, which affects nearly 8 million women, are estimated at nearly $14 billion.

- The direct costs of *diabetes* in women are estimated at over $58 billion.

- The direct costs of *breast cancer* are estimated at $9.1 billion.

- The Centers for Medicare and Medicaid Services (CMS), which pays a portion of these direct medical costs for women over 65 and disabled women, reports that for women alone it will spend $33.7 billion for cardiovascular disease, $4.4 billion for depression, $4.8 billion for diabetes, and over $0.8 billion for mammography in FY 2009.

Important primary and preventive services for women include screening for cancer, risks for heart disease and diabetes, sexually transmitted infections, intimate partner violence, provision of family planning services as well as counseling and interventions to reduce smoking or alcohol use/abuse, and improved nutrition and fitness are critical to achieve high quality care for women. These primary and preventive services during the reproductive years provide the opportunity to reduce the impact of chronic illness later in life through prevention, early detection and early intervention.

The evidence presented in these findings reinforces the link between health reform and reducing the economic burden of chronic disease through primary and preventive care that can prevent or mitigate the effects of disease. Of particular importance are:

- Comprehensive primary care and reproductive health care – and access to early prevention, detection and appropriate treatment – is available to all women;

- Health care for pregnant women begins prior to pregnancy, including help with the timing and spacing of pregnancies; and

- Women's health care is comprehensive and continuous across the lifespan.

Introduction

Over the course of women's lives, due in part to their reproductive health needs, women use the health care system more than men (Patchias and Waxman, 2007). Women suffer from chronic disease and disability at a rate disproportionate to men, with consequences for their own health and the health of their families. More women than men (38% vs. 30%) suffer from one or more chronic conditions, such as diabetes, asthma or hypertension, which require ongoing coordinated care. A large proportion of elderly women suffer from arthritis and hypertension, 61% and 58% respectively (Kaiser Family Foundation, 2005). Women of color have poorer health outcomes for many health conditions, and eliminating health disparities is a major public health challenge.

Approximately two-thirds of women obtain their health insurance through employer-based coverage (either from their employer or their spouses' employer) (Glied et al., 2008). In 2008, 6% of women purchased private individual health insurance, 10% were covered by Medicaid, and 3% were covered by other government insurance (Kaiser, 2008). Women with insurance often face higher premiums (National Women's Law Center, 2009) and spend more on out-of-pocket costs (Rustgi, Doty, Collins, 2000) than men. Overall, 18% of women under 65 are uninsured (Kaiser, 2008). Uninsured people are less likely to receive medical care and are more likely to be in poorer health than those who are insured (Hadley, 2007). Stable and continuous health care coverage of the range of primary and preventive health services for women should be an essential element of health care reform.

Earlier this year, the Mailman School of Public Health at Columbia University released a report, *Women's Health and Health Care Reform: The Role of Comprehensive Reproductive Health Care.* That study makes a scientific, data-driven case for a comprehensive standard of health for American women—a standard that enables women to **attain good health in childhood and adolescence, maintain good health during their reproductive years, and age well**. (Chavkin, Rosenbaum, et al., 2009). The Columbia report's findings have been endorsed by 39 of the nation's 50 Deans of Schools of Public Health.

The following report was prepared by the Jacobs Institute of Women's Health at The George Washington University School of Public Health and Health Services, and made possible by funding from the Women Donors Network and the Communications Consortium Media Center. It examines the costs of health care for women across the lifespan, and the role of primary and specialty care, as well as pregnancy care. This report identifies the prevalence, major health disparities, costs of care, and the available preventive services in health care settings for women.

We outline the economic underpinnings of disease and chronic conditions and the economic costs to the health care system and to the U.S. economy of chronic illness in women. Prevention, early detection and early intervention through primary care and pregnancy care before, during, and after women's reproductive years are essential to the strategy to reduce the burden of illness and disability.

Women typically seek care in primary care settings for family planning services and cancer screening prior to becoming pregnant (Hauenstein et al., 2006). Risk factors and health conditions can be identified during these visits to provide interventions that can reduce the cost of care later in life. Screening for cancer, identification of risks for heart disease, provision of family planning services and early detection of violence, as well as smoking cessation and nutrition counseling, begins during the reproductive years.

Although not all preventive health care services have been shown to result in immediate direct or indirect cost savings, prevention, early detection, and early appropriate care are critical to reduce the impact of illness in women across the lifespan. Comprehensive health care services, delivered through primary care settings, specialty care and during pregnancy, can reduce the incidence and burden of chronic illness later in life.

Six of the leading causes of death among women are associated with behavioral risks; thus screening, counseling and other interventions are key to improving health outcomes. Table 1 lists the prevalence of chronic disease and conditions in women and major risk factors. Tobacco smoking, poor diet, physical inactivity, and alcohol abuse are responsible for an estimated 900,000 deaths annually, or 40% of total yearly mortality. One in four women is obese and one in six women continues to smoke (Table 1). Studies suggest substantial health care savings may be achieved by investing in health promotion programs that modify poor health habits. In particular, physical inactivity and smoking are significant predictors of higher medical costs (Bland et al., 2009).

A healthy pregnancy, leading to the best outcome for both mother and child, begins when a woman is in the best possible health prior to conception. Counseling on obesity prevention and smoking cessation are vital prior to pregnancy; delaying counseling until after conception compromises a woman's ability to achieve the best outcomes. Women should receive timely screening services during pregnancy for conditions such as gestational diabetes, hypertension, and risks of preterm birth, depression, and violence. Unfortunately, pregnancy care is often not covered by individual insurance policies, and many women may be left to piece together haphazard contraceptive, pregnancy care and other benefits throughout their reproductive years (Kaiser Family Foundation, 2007; Neuschler, 2004; National Women's Law Center, 2009).

Approximately one in every three residents of the United States self-identifies as African-American, American Indian/Alaska Native, Asian/Pacific-American, or Latino. A large and growing body of research indicates that race and ethnicity continue to matter in access to, quality of, and delivery of care. Race is associated with disparities in health status, health insurance coverage, psychosocial stress and discrimination. People of color consistently fare poorer on many health outcomes, including deaths due to breast cancer and pregnancy-related causes.

Table 1 : Prevalence of Chronic Disease among Women		
	Prevalence (age >18 years)[a]	
	(%)	**(Million)**
Smoking	17.5	20.5
Obesity	25.2	29.5
Hypertension	32.9	36.3
CVD (including hypertension)	38.5	42.0
Psychological Distress	3.4	3.8
Diabetes	7.3	8.5
Osteoporosis	17.8	7.8
COPD[b]	10.7	9.0
Breast Cancer	2.1	2.5
Lung Cancer[c]	0.1	0.1
Cervical Cancer	0.9	1.1
Intimate Partner Violence (lifetime)[d]	26.4	30.2
Intimate Partner Violence	2.2	2.5

Source: NHIS 2007, with the exception of NHANES (2003-2006) for hypertension, (1999-2004) CVD, and (1988-1994) COPD, NHIS 2007 calculated by CDC for psychological distress, America's Bone Health, National Osteoporosis Foundation (2002) for osteoporosis, BRFSS 2005 for IPV, and 2005 United States Cancer Statistics for Lung cancer.
a) The age group for obesity (20+) and osteoporosis (50+).
b) COPD includes both moderate obstructive lung disease (both the FEV1/FVC ratio was <70% and the FEV1 was <80% of the predicted value) and mild obstructive lung disease (FEV1/FVC ratio was <70% and the FEV1 was >80% of the predicted value).
c) 2005 incidence.
d) Lifetime prevalence of IPV (definition see the IPV section).

Methods

Economic burden (or cost of illness) studies provide a consistent method of evaluation which can facilitate insight into the economic impact that illness has on society as a whole, as well as on individuals and their families. Costs of illness can be divided into direct costs associated with medical needs (e.g., inpatient stays, outpatient visits, and drugs) and indirect costs related to the inability to work and reduced productivity.

For this report, we rely on secondary data sources from nationally representative surveys. Our main source for prevalence estimates is the 2007 National Health Interview Survey (NHIS), one of the major data collection programs of the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC). The NHIS data are widely used by the Department of Health and Human Services (HHS) to monitor trends in health and health care, and to track progress toward achieving national health objectives. NHIS 2007 was used for smoking, obesity, diabetes, COPD, breast cancer, and cervical cancer. For psychological distress we used CDC estimates that are based on the 2007 NHIS.

The National Health and Nutrition Examination Survey (NHANES) examines a nationally representative sample of about 5,000 persons each year. The combination of personal interviews and physical examinations makes NHANES unique and its health estimates more reliable. In this paper we report CDC estimates for hypertension that are based on the NHANES 2003-2006 data (NCHS, 2009); National Heart Lung and Blood Institute estimates for CVD based on NHANES 1999-2004 (NHLBI, 2007); National Osteoporosis Foundation estimates for osteoporosis based on NHANES III (HHS, 2004); and CDC estimates for COPD that are based on the NHANES 1988-1994 data (CDC, 2002). CDC reported estimates from the United States Cancer Statistics (USCS) database are used for lung cancer incidence. Reported IPV estimates are estimated by Breiding, Black, Ryan (2008) on the basis of Behavioral Risk Factor Surveillance System (BRFSS) data from 16 states. Where possible we rely on crude prevalence estimates. All sources with the exception of the NHIS 2007 data are crude (non-age adjusted) estimates.

Estimates of the total number of women suffering from chronic disease were calculated on the basis of the prevalence estimates and census data available online (U.S. Census Bureau). We note that the calculation of total number of women based on age-adjusted prevalence estimates is imperfect. However, the difference between age-adjusted prevalence and crude prevalence does not bias the numbers that significantly and therefore the total numbers give a correct estimate of the order of magnitude of disease prevalence.

A search of English-language articles was conducted on PubMed using a combination of the following keywords: economic burden of disease, cost-of-illness, chronic diseases, and the specific diseases we examined. We limited the literature cited in this study to analyses that measure both direct and indirect costs where possible and were published after 1995. In addition, researchers with expertise in the field of economic burden of disease issues were consulted regarding existing publications and works in progress.

We report direct medical costs as they relate to women on the basis of the original cost estimates (smoking, osteoporosis, cervical cancer, and IPV). Direct medical costs were calculated where gender specific cost estimations were missing using the share of the disease burden on women (obesity, CVD, depression, diabetes, COPD, and HIV/AIDS). In the case of overall mental disorders and sexually transmittable infections no reliable burden of disease was available considering for these specific disease groups there is no clear gender differentiation in prevalence (Kessler et al., 2005). Therefore, we feel that a reasonable, rough estimate can be produced by dividing the total economic burden of disease in half to represent the economic burden of disease on women.

Most of the papers we reviewed provide gender-specific indirect costs (with the exclusion of osteoporosis, cervical cancer, and intimate partner violence). Methods and inclusion criteria used across research and disease groups vary widely, which negatively affects the comparability of the estimates. Therefore, female-specific indirect cost estimates were not reported. To allow comparability of cost estimates all costs throughout this document have been converted to current 2009 dollars. A complete list with references is made available in the Appendix.

Spending on women's health services by Medicare and Medicaid are reported from the Moyer Table on Women's Health 2009, provided by the Centers for Medicare and Medicaid Services and the Department of Health and Human Services to Congress (available from HHS).

The recommended preventive screening and counseling services for women are based on the recommendations made by the United States Preventive Services Task Force and the Department of Health and Human Services Office on Women's Health, the CDC and health professional organizations.

Findings

Direct and indirect costs of the major chronic health conditions faced by women (cardiovascular disease, mental health disorders, breast cancer, cervical cancer, diabetes, osteoporosis, intimate partner violence, sexually transmitted infections, HIV/AIDS), as well as for health-related behaviors (smoking and obesity) (Table 2) have been estimated. Cost estimates are available for direct and indirect costs for both men and women in many cases, and we have estimated the direct costs for women only where possible. Table 2 demonstrates that cardiovascular disease, which affects 43 million U.S. women, is estimated to cost $166.4 billion per year in direct costs. Depression for both women and men is estimated to cost over $100 billion in direct and indirect costs, and over $20 billion in direct costs for women. Osteoporosis, which affects nearly 8 million women, costs nearly $14 billion for direct medical costs alone. Direct costs for breast cancer care are estimated to be $9.1 billion. The Centers for Medicare and Medicaid Services (CMS) pays a portion of these direct medical costs for women over 65 and women with disabilities; CMS reports that it will spend $33.7 billion for cardiovascular disease in women, $4.4 billion for depression in women and $ 0.8 billion for mammography in FY 2009.

We also analyzed the need for timely preventive care, health care screening, early detection, treatment and counseling, which are important throughout the lifespan as well as prior to and during pregnancy. Health disparities in outcomes are also identified. Figure 1 illustrates the range of health care screening, counseling and early intervention health care services that are important for women at each stage of their lives.

Table 2: Economic Burden of Disease for Men and Women (Billions of U.S. Dollars, 2009)					
	Men and Women[a]			Women only	CMS 2009 women's health allocation[f]
	Direct Costs	Indirect Costs	Total	Direct Costs	
Smoking[b]	96.6	104.3	200.9	46.1[g]	--
Obesity[c]	114.1	--	--	57.1[g]	--
CVD[d]	313.8	161.5	475.3	162.0[g]	33.7
Depression	32.0	70.2	102.3	20.2	4.4
Mental Disorders[e]	169.5	39.7	209.2	84.7[g,h]	4.4
Diabetes	118.7	59.4	178.1	58.2[g]	4.8
Osteoporosis	18.4	--	--	13.9	--
COPD	23.7	18.5	42.2	9.6[g]	5.1
Breast Cancer	9.1	--	--	9.1	0.8[i]
Cervical Cancer	--	--	--	0.34-0.45	--
IPV	--	--	--	4.7	--
STIs (excluding HIV)	0.1	--	--	0.04[h]	--
HIV/AIDS	0.1	--	--	0.02	--

-- Data not available.
a) References for economic burden of disease can be found in the main document.
b) Economic costs of smoking include a share of CVD, diabetes, and COPD costs.
c) Economic costs of obesity include a share CVD and diabetes costs.
d) CVD includes heart diseases, hypertensive disease, stroke, and heart failure.
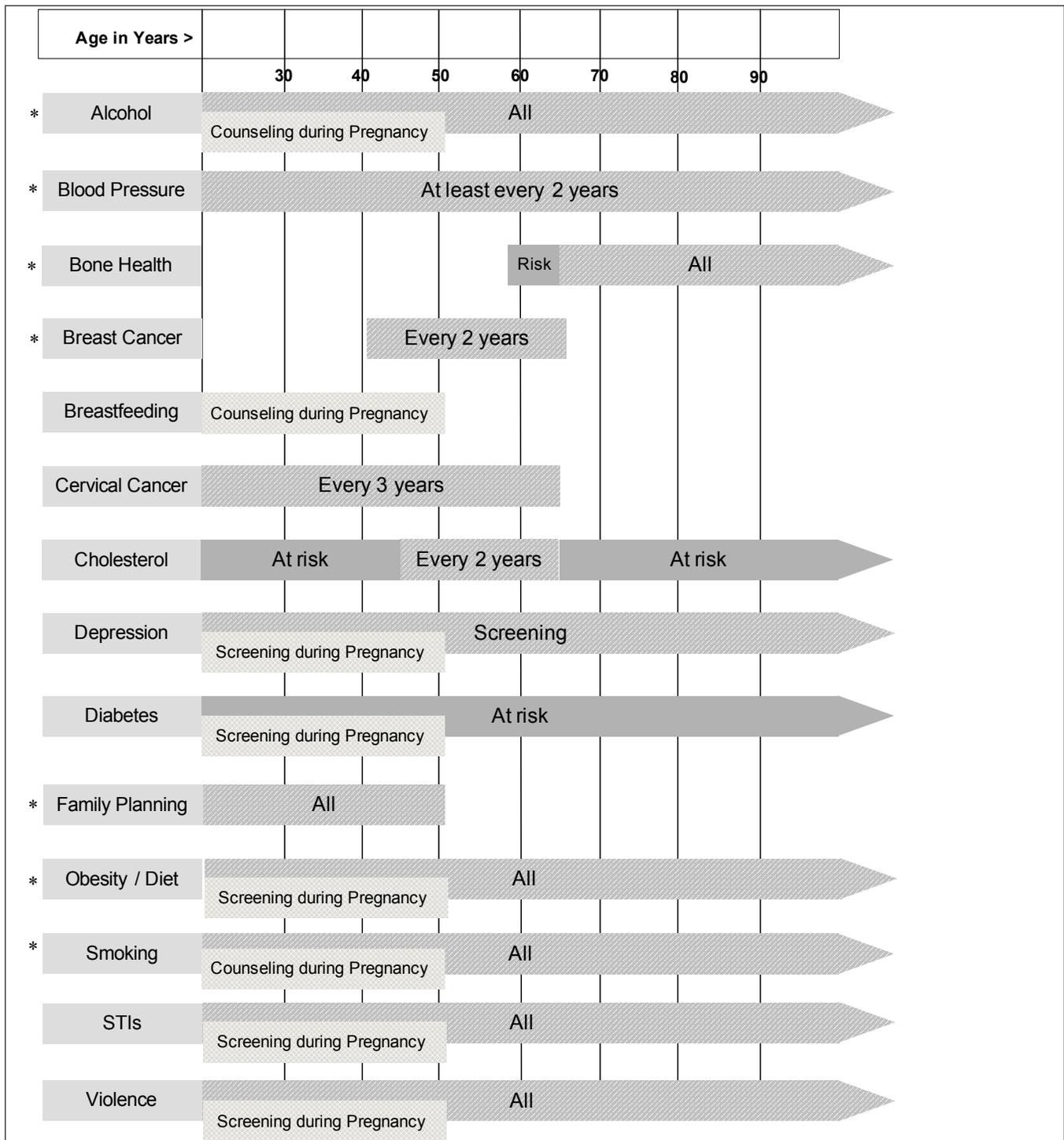e) Mental Disorders includes depression.
f) Source: Department of Health and Human Services: Women's Health Moyer Table (2009).
g) Direct costs are estimated using the share of women who suffer from the condition (or health behavior).
h) Due to the lack of gender specific prevalence data this estimate is calculated on the basis of 50% share of burden of disease for women.
i) CMS estimated benefit outlays for screening and diagnostic mammograms.

Figure 1: Recommended Preventive Screening and Counseling Services for Women

Age in Years >									
	30	40	50	60	70	80	90		

* Alcohol — All / Counseling during Pregnancy

* Blood Pressure — At least every 2 years

* Bone Health — Risk / All

* Breast Cancer — Every 2 years

Breastfeeding — Counseling during Pregnancy

Cervical Cancer — Every 3 years

Cholesterol — At risk / Every 2 years / At risk

Depression — Screening / Screening during Pregnancy

Diabetes — At risk / Screening during Pregnancy

* Family Planning — All

* Obesity / Diet — All / Screening during Pregnancy

* Smoking — All / Counseling during Pregnancy

STIs — All / Screening during Pregnancy

Violence — All / Screening during Pregnancy

Source: United States Preventive Services Task Force
(http://www.ahrq.gov/clinic/pocketgd08/pocketgd08.pdf), HHS, Office of Women's Health
(http://www.womenshealth.gov/screeningcharts/general/general.pdf), and CDC (2006b).
* Counseling

Chronic Diseases and Conditions:

Cardiovascular Disease

Prevalence: Cardiovascular disease (CVD)[1] is the most prevalent of the chronic diseases affecting both women and men; almost four out of every 10 adult women over age 18 suffers from it (Table 1). Cardiovascular disease also causes a large share of mortality: over one-third of deaths in 2004. Prevalence of CVD increases with age (NHANES 1999-2004): 51% of women over age 50 suffer from hypertension (Robinson, 2007). CVD patients also have an increased risk of co-morbidities. Hypertensive disorders complicate an estimated 12% to 22% of all pregnancies and are responsible for 17.6% of maternal deaths in the United States (Walker, 2000; Koonin et al., 1997).

Health disparities: African-American women are more likely to have high blood pressure: 42% of African-American women over age 20 suffer from hypertension, in contrast to 27% of whites and 24% of Mexican-American women (NHANES 2004-2005). African-American women are more likely to die from heart disease and stroke than white women. In 2005, age-adjusted death rates for heart disease and stroke are respectively 28% and 38% higher among African Americans than among whites (AHA, 2009). A 2007 series of analyses of NCQA HEDIS managed care plan data revealed that compared to men, women are less likely to be screened for common CVD risk factors (e.g., hypertension, dyslipidemia, blood glucose levels), and that African-American women experienced even greater screening disparities (Chou et al., 2007).

Costs: Total costs associated with CVD[2] are the highest among all the disease groups identified (Table 1). Economic costs (direct and indirect costs) for men and women will comprise an estimated $475 billion in 2009 (AHA, 2009). In 2009, total economic costs for cardiac heart disease are estimated to be $165.4 billion, of which $121.6 billion will be for indirect costs and total economic costs for hypertensive disease at $73.4 billion, of which $19.2 billion are estimated as indirect costs (AHA, 2009). Compared with adults without hypertension, the annual additional direct costs for treating hypertension were estimated at $1,131 per hypertension patient (Balu and Thomas, 2006). Of these additional direct costs, more than 90% are attributed to prescription medicines, inpatient visits and outpatient visits (Balu and Thomas, 2006). Based on the proportion of women with CVD (52% in 2006), direct costs associated with CVD for women would be $162 billion. These figures are more likely underestimated rather than overestimated. Balu and Thomas (2006) found that treatment costs for hypertension increase with age and are higher for women. CMS expenditures on women with CVD are $34 billion (Table 2).

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1 Cardiovascular disease includes hypertension, coronary heart disease, cerebrovascular disease, and heart failure.
2 CVD includes heart diseases, hypertensive disease, stroke, and heart failure (AHA, 2009).

Prevention:
- Primary care: Left under-treated or untreated, high blood pressure can lead to other serious health conditions such as heart disease, stroke, and kidney disease. Risk factors for hypertension include overweight and obesity, for which effective interventions are available. Weight loss, exercise, smoking cessation, alcohol reduction, salt restriction, dietary changes and stress reduction have all been shown effective in decreasing blood pressure (CDC, 2008a).
- Pregnancy care: Blood pressure monitoring and management are essential parts of prenatal care. Death from maternal hypertensive disease is preventable through early diagnosis and blood pressure management. Identification of hypertension in pregnancy provides an opportunity to identify women at higher risk of heart disease later in life.

Mental Health

Prevalence: The importance of mental health disorders is often underestimated: close to half the adult population has a mental health disorder sometime in their lives, and 3.4 million adult women are estimated to have suffered from serious psychological distress in the previous 30 days (Kessler et al., 2005a).[3] During their lifetimes, women are 1.7 times more likely to suffer from major depressive disorder than men (Kessler et al., 2003) and 1.5 times more likely to suffer from lifetime mood disorder (Kessler et al., 2005a). In the majority of cases, depression goes unrecognized and untreated. The highest rates for depression occur in women between 25 and 44 (Weissman, 1995). An estimated 500,000 pregnancies each year involve women with psychiatric illnesses that either predate or emerge during pregnancy (ACOG, 2008). Although pregnancy itself does not increase the risk of depression, symptoms are common in pregnancy. Approximately 10% to 16% of pregnant women fulfill diagnostic criteria for depression, and up to 70% of pregnant women report symptoms of depression (Nayak and Al-Yattama, 1999). Many symptoms of depression overlap with the symptoms of pregnancy and are often overlooked (Gotlib, 1989).

Many medical conditions – including migraine, viral and bacterial infections, HIV/AIDS, cancer, and cardiopulmonary disease – are accompanied by symptoms of depression. In addition, depression frequently coexists with other medical conditions.

Health disparities: Whites have a higher risk for reported lifetime mental disorder – including any anxiety, mood, and substance use disorder – than African-Americans (Kessler et al., 2005b). Conditions among African-American and Hispanic minorities may be underreported due to stigma, reduced access to services, and/or reluctance to seek medical care.

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3 Lifetime prevalence is defined as the number of people who have had a mental disorder sometime in their lifetime. The DSM-IV disorders include anxiety disorders (panic disorder, generalized anxiety disorder, agoraphobia without panic disorder, specific phobia, social phobia, post-traumatic stress disorder, obsessive-compulsive disorder, separation anxiety disorder), mood disorders (major depressive disorder, dysthymia, bipolar disorder I or II), impulse control disorders (oppositional defiant disorder, conduct disorder, attention-deficit/hyperactivity disorder, intermittent explosive disorder), and substance use disorders (alcohol and drug abuse and dependence).

Costs: In 2007, annual total costs for mental health disorders (using the CMS definition) among men and women were $209 billion (2009 dollars) or 7.5% of total costs of treating illness in the United States (NHLBI, 2007). Based on the proportion of women suffering from a mental health disorder, direct costs associated with mental health disorders would be $84.7 billion. Indirect costs estimated on the basis of suicide-related costs and work-related costs outweigh direct medical costs for both men and women; respectively $70 billion and $32 billion (2009 dollars) (NHLBI, 2007). With the exception of coronary artery disease, depression results in more lost time from work than any other medical condition, with direct costs related to the illness estimated to be $20.2 billion (2009 dollars). CMS expenditures on women with depression are $4.4 billion in direct expenditures (Table 2).

Prevention:

- Primary care: The two most common treatments for depression are psychotherapy and medication. The National Institute of Mental Health recommends psychotherapy for mild to moderate depression. Studies indicate that for adolescents a combination of medication and psychotherapy is the most effective treatment for major depression and reduces the likelihood of recurrence (March et al., 2004). Health promotion through self-care education is found to be highly effective to reduce substance abuse and improve mental health (Broskowski and Smith, 2001).
- Pregnancy care: Counseling and medication are available to women for a variety of psychiatric conditions in pregnancy and after delivery. Ongoing treatment and monitoring are important to maintain the health of the women and infant.

Breast Cancer

Prevalence: Breast cancer is the second leading cause of all cancer-related deaths among women, after lung cancer. The lifetime risk for a woman to develop breast cancer is approximately 13%, meaning that one in eight women develops breast cancer.

Health disparities: The incidence of breast cancer is higher among white women than among African-American women. However, African-American women are more likely to die of the disease (32.8 per 100,000 for African Americans and 23.3 per 100,000 for whites) (CDC, 2005a). Researchers have found that due to disparities in income and access to care, African-American women tend to be diagnosed at later stages of breast cancer than white women. (Hogue, 2002).

Costs: The National Cancer Institute estimates direct breast cancer treatment costs to be $9.1 billion (2009 dollars based on 1997-1999 prices) (NCI, 2008). Close to 100% of these costs are for women. Federal expenditures through the Medicare and Medicaid screening and diagnostic programs on women with breast cancer are $0.8 billion of direct expenditures (Table 2)(Moyer Table, available from HHS). Medicare and Medicaid also cover a significant portion of breast cancer treatment costs which are unreported by CMS.

Prevention:
- Primary care: Clinical breast exams, screening mammograms, and ultrasound imaging improve early detection of breast cancer. Some individuals with inherited forms of breast and ovarian cancer can have their risk identified with the help of genetic testing. Early detection of breast cancer has been shown to decrease the mortality rate (ACS, 2003).
- Pregnancy care: Breast care is an important part of prenatal care, including breast exams at the beginning and end of pregnancy. Breastfeeding can reduce the risk of breast cancer, and studies have shown that counseling can be successful at promoting increased breastfeeding (Schwarz et al., 2009).

Cervical Cancer

Prevalence: In 2006, 1.4 million women over the age of 18 were told by a doctor or other health professional that they had cervical cancer (HHS, 2007). The American Cancer Society estimates that in 2003, more than 13,000 new cases of invasive cervical cancer and 4,100 deaths from it occurred in the United States. Cervical cancer is the cancer most commonly diagnosed during pregnancy (ASCCP, 2009).

Health disparities: Survival rates vary among ethnic groups. For cervical cancer, both incidence and survival rates for African-American women are lower than those of white women (HHS, 2007). Death rates among black women (5.9 per 100,000) are approximately twice as high as among white women (2.4 per 100,000). The incidence of cervical cancer is highest among Vietnamese women (43.0 per 1000,000) as compared to (11.2 per 100,000) for black and (7.3 per 100,000) for white women (CDC, 2000). The persistent disparity is attributed to the prevalence of risk factors for cervical cancer, differences in screening and treatment, and differences in stage of disease at diagnosis (CDC, 2000).

Costs: In 2003, direct annual costs of treating cervical cancer were estimated at $340 million to $450 million (2009 dollars) (Insinga et al., 2005).

Prevention:
- Primary care: Much of the substantial decrease in incidence of invasive cervical cancer and mortality from the disease is attributed to widespread use of Pap smear testing. Where comprehensive detection, treatment, and referral programs have been implemented, the incidence and mortality rates of this cancer have decreased dramatically (Sankaranarayanan et al, 2001). Most cases of invasive cervical cancer occur among women who were not screened during the previous five years (Grosse et al., 2007). One in 10 adult women are not regularly screened (Sirovich and Welch, 2004). The Human Papilloma Virus (HPV) vaccine is recommended for women age 26 and younger and helps prevent the most common forms of HPV that lead to cervical cancer.
- Pregnancy care: Cervical cancer screening is an essential component of prenatal care, with screening at the beginning and end of pregnancy. It is also recommended for preconception and interconception care.

Diabetes

Prevalence: Diabetes is the fifth-deadliest disease in the United States. Approximately 9 million or 7.7% of all adult women in the United States have diabetes (NHIS, 2007). However, about a third of them are not aware of their condition. A woman born in 2000 has an estimated 38.5% lifetime risk of developing diabetes (Narayan et al, 2003). Before women develop Type 2 diabetes, they usually have "pre-diabetes" – blood glucose levels that are higher than normal but not yet high enough to be diagnosed as diabetes. Some 57 million people in the U.S. have pre-diabetes (National Diabetes Clearinghouse, 2008). People with pre-diabetes may be able to prevent the development of Type 2 diabetes by making dietary changes and increasing their physical activity levels, thereby reducing the potential for long-term damage to the body (ADA).

Women with diabetes are also at increased risk of vaginal infections and complications during pregnancy. Gestational diabetes, or diabetes that develops during pregnancy, occurs in 5% of all pregnancies, or about 200,000 cases a year (NICHD, 2009). Women who have had gestational diabetes are at increased risk for developing Type 2 diabetes later in life (Dornhorst and Rossi, 1998; Buchanan et al., 1998).

People with diabetes are at increased risk for other diseases, including cardiovascular disease, the most common complication. The increased risk for CVD is more serious among women than men; deaths from heart disease in women with diabetes have increased by 23% over the past 30 years, compared to a 27% decrease in deaths from heart disease among women without diabetes (Gu et al., 1999).

Health disparities: The prevalence of physician-diagnosed diabetes is two to four times higher among African-American, Hispanic/Latina, American Indian, and Asian/Pacific Islander women than among white women.

Costs: In 2007, total estimated cost of diabetes among men and women was $178 billion (2009 dollars) with two-thirds spent on direct medical costs (Dall et al, 2008). Direct diabetes costs in 2007 for women totaled close to $60 billion (2009 dollars) (Table 2). In 2009, CMS estimates $4.8 billion in spending for treatment of diabetes in women.

Prevention:
- Primary care: Regular screening for glucose levels, hypertension, and weight loss and exercise counseling in physicians' offices have been effective at preventing the progression of pre-diabetes to diabetes.
- Pregnancy care: Diabetes in pregnancy must be found early or even prior to pregnancy to significantly improve outcomes. Identification of risk factors and diagnosis of gestational diabetes provides an opportunity to address and reduce the later risks for Type 2 diabetes and heart disease in women.

Osteoporosis

Prevalence: In 2002, 7.8 million postmenopausal women, or one in five women over the age of 50, had osteoporosis. Another 21.8 million had low bone mass and thus were at increased risk for osteoporosis (National Osteoporosis Foundation, 2002). Osteoporosis results in over 2 million fractures every year in the U.S., with close to 1.5 million of them experienced by women (Burge et al., 2007).

Health disparities: In 2005, the overwhelming majority of fractures (88.6%) occurred among non-Hispanic white women (Burge et al., 2007).

Costs: In 2005, direct medical costs due to osteoporosis-related fractures were estimated to total $13.9 billion for women (2009 dollars) (Burge et al., 2007). The majority (72%) of these costs were related to hip fractures, (Burge et al., 2007). Fractures become more frequent with age and are expensive to treat. Aging and other demographic trends will increase future prevalence and incidence of osteoporosis-related fractures. As a result, direct medical expenditures are projected to grow by almost 50% by 2025, to $25 billion per year (Burge et al., 2007).

Prevention:
- Primary care: Osteoporosis is a largely preventable complication of aging. Appropriate screening strategies and significant pharmacologic interventions are available to prevent and treat osteoporosis. Women should be counseled about preventive measures early in life: adequate calcium consumption; using dietary supplements if dietary sources are not adequate; adequate vitamin D consumption; regular weight-bearing and muscle-strengthening exercises to reduce falls and prevent fractures; smoking cessation; and moderation of alcohol consumption.
- Pregnancy care: Prenatal vitamins taken throughout a pregnancy and even in preparation for a pregnancy and breastfeeding are an important source of calcium for women and maintenance of bone health.

Intimate Partner Violence

Prevalence: Annually, intimate partner violence (IPV)[4] results in approximately 2 million injuries and 1,300 deaths for women. In 2005, a set of questions related to IPV was administered with the Behavioral Risk Factor Surveillance System (BRFSS) in 16 states. Results suggest that one in every four women in the study experienced IPV in her lifetime (Breiding, Black, Ryan, 2008a). Women who are victims of IPV are more likely to have worse health outcomes such as high cholesterol, CVD, joint disease, asthma, and activity limitations. In addition, they are more likely to adopt unhealthy behaviors such as risk factors for HIV infection, smoke, or drink, and are less likely to visit a doctor for check-ups (Breiding, Black, Ryan, 2008b). Women who have a history of IPV may also be more likely to become involved with the criminal justice system (Covington, 2007).

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4 IPV against women includes rape, physical assault, and stalking perpetrated by a current or former date, boyfriend, husband, or cohabiting partner, with cohabiting meaning living together as a couple (Breiding, Black, Ryan, 2008a).

Health disparities: Reported lifetime IPV was higher among women of more than one ethnic origin than non-Hispanic white women, while Asian and Hispanic women were less likely to report intimate partner violence than non-Hispanic white women (Breiding, Black, Ryan, 2008a). A separate nationally representative survey by the National Crime Victimization Survey showed that the percentage of nonfatal IPV[5] reported to the police between 2001 and 2005 was higher among African-American females than white females (Catalano, 2007).

Costs: In 2003, total direct medical costs related to IPV were estimated to be $6.7 billion (2009 dollars) for women, of which $4.7 billion was associated with direct medical costs (Breiding, Black, Ryan, 2008a).

Prevention:
- Primary care: Many professional societies continue to recommend screening or assessing patients for IPV (Lipsky et al., 2009). Both primary and secondary prevention efforts should be culturally informed and specific. Racial/ethnic groups are complex, heterogeneous, and diverse and may benefit from tailored prevention efforts.
- Pregnancy care: Women should be screened regularly at prenatal and postpartum visits. Pregnancy is one of the few times when women and their partners are present for care; thus it is an important opportunity for violence screening.

Sexually Transmitted Infections

Prevalence: 19 million new sexually transmitted infections (STIs)[6] occur each year in the United States — almost half of them among young people 15 to 24 years of age. One in four American teens has an STI. In 2007, 1,108,374 cases of *Chlamydia trachomatis* were reported to the Centers for Disease Control and Prevention (CDC). This is the highest number of cases ever reported to CDC for any condition. Each year, 2.2 million pregnant U.S. women are infected with an STI (CDC, 2008b). The majority suffer from bacterial vaginosis (1 million), a condition where the normal balance of bacteria in the vagina is disrupted, and herpes simplex virus 2 (0.8 million).

Women bear a disproportionate burden of the long-term health consequences of STIs, including pelvic inflammatory disease and infertility. In 2007, the rate of Chlamydia cases among women was three times that of men (543.6 cases per 100,000 women compared to 190 cases per 100,000 men). The gonorrhea infection rate was also higher among women (123.5 per 100,000 women compared to 113.7 per 100,000 among men).

Impact on chronic disease: Human Papilloma Virus (HPV) infection is the cause of almost all cervical cancers (Steben and Duarte-Franco, 2007). Chlamydia and gonorrhea often have no symptoms and may go undetected. If left untreated, up to 40% of Chlamydia and gonorrhea infections in women can cause ectopic pregnancy, chronic pelvic pain, or result in pelvic inflammatory disease – a condition that causes as many as 50,000 women to become infertile each year.

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5 IPV in the NCVS is defined as 'rape, sexual assault, robbery, aggravated assault, and simple assault'.

6 STIs includes HIV, HPV, genital herpes, hepatitis B, Chlamydia, gonorrhea, trichomoniasis, and syphilis.

Health disparities: Across all age groups, non-Hispanic African-American women have the highest rate of Chlamydia, followed by American Indian/Alaskan Native and Hispanic women. In 2007, gonorrhea rates were 19 times higher among African-Americans than among whites.

Costs: The estimated lifetime direct medical costs of nine million new cases of STIs among 15- to 24-year-olds (men and women) in 2000 was $4.3 billion (2009 dollars) (Chesson et al., 2004). Given an average life expectancy of 78 years (75 years for men and 80 years for women), approximately $70 million (2009 dollars) annually is spent on STIs excluding HIV. The lifetime costs per case of HPV, Chlamydia, and gonorrhea are more for women than for men. HPV is the most costly STI (not including HIV/AIDS), accounting for $3.6 billion (2009 dollars) in lifetime direct medical costs (Chesson et al., 2004).

Prevention:
- Primary care: Most women are infected through unprotectected heterosexual contact. Annual Chlamydia screening for all sexually active women under age 26 is recommended, as well as for older women with risk factors such as new or multiple sex partners. Vaccines are available for the prevention of two common sexually transmitted viral infections: Hepatitis B and HPV. Abstinence and reduction in the number of sexual partners can be effective methods of avoiding STIs. Latex condoms, when used consistently and correctly, can reduce the risk of gonorrhea, Chlamydia, and trichomoniasis transmission.
- Pregnancy: The 2006 CDC Guidelines for Treatment of Sexually Transmitted Diseases (STDs) recommend that pregnant women be screened on their first prenatal visit for STDs including Chlamydia, gonorrhea, hepatitis B, HIV, and syphilis.

HIV/AIDS

Prevalence: In 2005, a total of 126,964 women were living with diagnosed HIV/AIDS (CDC, 2008c). In 2005 an additional 9,708 women were newly diagnosed (CDC, 2008c). Although the number of new cases declines annually, women accounted for 27% of HIV cases in 2004, up from 8% in 1985 (KFF, 2006). Over 50% of HIV/AIDS cases are estimated to be undiagnosed. CDC estimated that by the end of 2006, approximately 278,400 adult and adolescent women were living with diagnosed or undiagnosed HIV/AIDS (CDC, 2008c).

Women can transmit HIV to their children during pregnancy, during delivery, or through breastfeeding. Nearly all AIDS cases among U.S. children are due to mother-to-child transmission. In 1992, 855 U.S. children developed AIDS, but in 2005 only 57 children developed AIDS (CDC, 2008c) due to increased screening of pregnant women and increased administration of antiretroviral medication to prevent vertical transmission of HIV during childbirth.

Impact on chronic disease: People living with HIV who are not treated will probably develop one or more opportunistic infections such as pneumocystis carinii pneumonia, candidiasis, toxoplasmosis, cytomegalovirus retinitis, tuberculosis, and increased risks of cervical cancer, and lymphomas (DHHS, 2009). Untreated HIV, of course, most often leads to a diagnosis of AIDS.

Health disparities: African-American and Hispanic women are at significantly higher risk of contracting HIV/AIDS. In 2007, the incidence among female adults and adolescents was nearly 20 times as high among African-American women (60.6 per 100,000) as the rate among white females (3.3 per 100,000), and the incidence among Hispanic females was nearly four times as high (16 per 100,000) (CDC, 2008c). In 2007, the AIDS diagnosis rate was 22 times higher for African-American females than for white females, 39.8 and 1.9 per 100,000 respectively (CDC, 2008c). In 2007, the estimated HIV prevalence rate for African-American women (1,122.4 per 100,000) was nearly 18 times the rate for white women (62.7 per 100,000), and the rate for Hispanic women (263.0 per 100,000) was more than four times the rate for white women (CDC, 2008d). HIV is the leading cause of death among African-American women between 25 and 34 (CDC, 2008c).

Costs: Lifetime HIV costs per new case range between $176,500 and $223,300. HIV accounts for $3.3 billion to $4.1 billion (2009 dollars) in direct lifetime medical costs for both men and women, or between $272 million and $344 million in annual direct costs (Chesson et al., 2004). Chesson et al. estimated a lower bound of expenditures because their lifetime costs are based on 12 years of care while estimated life expectancy following HIV infection is 22 to 26 years for persons receiving highly active antiretroviral treatment (HAART). Using the share of HIV cases affecting women (27%), lifetime direct costs accounts for between $0.9 billion and $1.1 billion or between $73 million and $93 million annually.

Prevention:
- Primary care: The CDC recommends HIV testing be a routine part of medical care. Abstinence and reduction in the number of sexual partners can be effective methods of avoiding STIs. Latex condoms, when used consistently and correctly, are highly effective in preventing HIV transmission.
- Pregnancy: The 2006 CDC Guidelines for Treatment of Sexually Transmitted Diseases recommend that pregnant women be screened on their first prenatal visit for HIV. Women who have HIV can reduce the likelihood that their child will contract HIV during pregnancy from 25% to 2% if certain precautions are taken. These include: seeing a medical professional, taking prescribed medications (e.g., AZT), and arriving at the hospital early for delivery.

Health Behaviors and Risks:

Smoking

Prevalence: Smoking prevalence among women has decreased substantially since the 1960s, but one in six adult women over the age of 18 (17.4%) still smoked in 2007 (NHIS, 2007). Cigarette smoking during pregnancy is the most modifiable cause of adverse birth outcomes in the U.S. Despite extensive anti-smoking publicity, an estimated 11% to 20% of all pregnant women in the U.S. still smoke (Jesse et al., 2005).

Impact on mortality: Cigarette smoking continues to cause premature deaths: between 1995 and 1999, an average of 178,311 deaths among women annually (CDC, 2002). Cigarette smoking accounts for 30% of all cancer deaths in the U.S., including one in four lung cancer deaths, and is highly related to heart disease and chronic lung disease (Jemal et al., 2008; CDC, 2005b). Smoking during pregnancy, even light smoking (less than six cigarettes per day), has negative consequences such as reduced birth weight and up to 40% higher infant mortality (Martin et al., 2003). Cigarette smoking also increases the risk for stillbirth and sudden infant death syndrome (CDC, 2006).

Impact on chronic diseases: Smoking increases risk for cancers, including stomach and cervical cancer. Women who smoke double their risk for developing coronary artery disease and increase by more than tenfold their likelihood of dying from chronic obstructive pulmonary disease. Postmenopausal women who smoke have lower bone density and increased risk for hip fractures than women who never smoked (DHHS, 2001). Cigarette smoking is one of the most important modifiable causes of poor reproductive health and pregnancy outcomes in the United States - it increases the risk for infertility, preterm delivery, and low birth weight.

Health disparities: Current smoking rates among racial/ethnic groups vary widely. One in four American Indian or Alaska Native women currently smokes cigarettes (26.8%), significantly more than among white women (20%) and African American women (17.3%). Smoking among Hispanics and Asians is significantly lower, 11% and 6% respectively (CDC, 2006).

Costs: Estimated direct costs of smoking range between 6% and 8% of total annual expenditures for health care (Surgeon General, 2004). In 1995 and 1999, smoking tobacco resulted in a total estimated cost of $200 billion (2009 dollars) with close to half spent on direct medical costs (CDC, 2002). Direct costs the proportion of smokers who are women totaled around $46 billion (2009 dollars) for women and an additional $34 billion (2009 dollars) in productivity costs (CDC, 2002). Every $1.00 spent on targeted smoking cessation counseling among pregnant women was found to result in $3.31 savings in subsequent direct costs for low-birth-weight infants in a neonatal intensive care unit (Broskowski and Smith, 2001).

Prevention:
- Primary care: Tobacco smoking prevention and control is one of the most cost-effective forms of health promotion (Grosse et al., 2007). Comprehensive state-level tobacco control programs that included both mass media campaigns and telephone quit lines have been highly successful at low cost to reduce overall smoking and the prevalence of youth smoking (Grosse et al., 2007).

- Pregnancy Care: Increased public education measures and public health campaigns in the United States have led to a decline in smoking during pregnancy (Colman and Joyce, 2003). Pregnancy motivates women to make lifestyle changes; approximately 46% of pre-pregnancy smokers quit during pregnancy. It is estimated that eliminating smoking during pregnancy would reduce infant deaths by 5% and reduce the incidence of singleton low-birth-weight infants by 10.4% (Salihu et al., 2003; Ventura, 2003).

Obesity

Prevalence: The prevalence of obesity in the United States has increased dramatically over the past 13 years. As a consequence, more than half the adult female population is overweight; one in four adult women in the U.S. is obese (25.6%) (BRFSS 2008). The prevalence of overweight and obesity among children and adolescents increased significantly between 1999 and 2004 (Ogden et al., 2006).

Impact on chronic disease: Obesity is a major risk factor for many chronic diseases and associated with increased health problems, including Type 2 diabetes, hypertension, cardiovascular diseases, infertility, heart disease, gallbladder disease, osteoarthritis, gynecological problems such as abnormal menses and infertility, and a variety of cancers, including breast, uterine, and colon cancers (CDC, 2009). In addition, obese women are five times more likely than non-obese women to develop endometrial cancer.

Health disparities: Obesity is more prevalent among African-American and Hispanic women and varies by race and ethnicity. Between 2001 and 2004, 51% of African-American adult women were obese, compared with 39% of women of Hispanic origin and 31% of non-Hispanic white women (NCHS, 2007). Health disparities start at a young age; African-American and Hispanic girls are more likely to be obese than non-Hispanic white girls in grades 9-12 (AHA, 2009).

Costs: There is a clear relationship between obesity and increasing health care costs. Obese people have 36% higher inpatient costs and 77% higher medication costs than non-obese people (Sturm, 2002). Twenty-seven percent of the rise in health care expenditures in the U.S. relative to other developed countries is attributed to obesity (Thorpe et al., 2004). In 1998, overweight- and obesity-attributable medical spending represented almost 10 percent of health care spending in the U.S., a total of $114 billion (2009 dollars) (Finkelstein et al., 2003). Direct costs of obesity, based on the share of obese women, totaled around $57 billion (2009 dollars). Incremental lifetime costs of obesity for the 9 million obese children in the U.S. would account for almost $500 billion (McKinnon, 2009).

Prevention:
- Primary Care
  Primary Prevention: Exercise and good nutrition are critical to maintaining a healthy weight. The Surgeon General recommends physical activity for adults of at least 30 minutes on most days of the week, and 60 minutes on most days of the week for children. Recommendations also include consuming nutrient-dense foods and beverages while limiting intake of saturated and trans-fats, cholesterol, added sugars, salt, and alcohol.

Secondary prevention: The U.S. Preventive Services Task Force recommends that clinicians screen all adult patients for obesity and offer counseling and behavioral interventions to promote sustained weight loss for obese adults. Nutrition and weight loss counseling have been shown to be effective at weight reduction in a primary care setting. Physical activity and nutrition habits are teachable and modifiable. In addition, according to NIH's National Heart, Lung, and Blood Institute, losing as little as 5% to 10% of one's base weight leads to significant reductions in risks for development of heart disease, diabetes, and high blood pressure.

- Pregnancy care: The prevention of maternal obesity and maternal diabetes is critically important. Maternal obesity and diabetes are linked to increased birth weight and consequent increased body weight in adulthood (Whitaker and Dietz, 1998). There is a clear association between birth weight and adult weight. Therefore, it is important to ensure only appropriate weight gain as specified by a healthcare provider. A moderate weight reduction is safe for breastfeeding women and does not compromise weight gain of the nursing infant (DHHS, 2005).

Conclusion

This report demonstrates the extremely high costs of chronic conditions and illnesses in women and the disproportionate burden of disease and disability they face. However, calculating the true costs of chronic diseases and conditions is difficult, as is measuring the direct or indirect saving that may accrue through high quality primary and preventive care. Estimated costs to Medicare and Medicaid are limited by the reporting by specific disease category and likely underestimate the costs to CMS.

The recommendations for early primary care and preventive services during the reproductive years identify key opportunities to reduce the impact of chronic illness later in life through prevention, early detection and early intervention. Screening for cancer, risks for heart disease, family planning services and detection of violence, as well as smoking cessation and nutrition counseling, should begin early in life and continue through a woman's reproductive years during primary care and family planning visits. Identification of hypertension and/or gestational diabetes in pregnancy provides an opportunity to identify women at higher risk of heart disease and diabetes later in life, along with the possibility of reducing her risks and improving her health outcomes as she ages.

These findings make it clear that in order to improve the long-term health of women and to reduce the burden of chronic disease and conditions, health care reform should ensure that:

- Comprehensive primary care and reproductive health care – and access to early prevention, detection and appropriate treatment – are available to all women;

- Health care for pregnant women begins prior to pregnancy, including help with the timing and spacing of pregnancies; and

- Women's health care is comprehensive and continuous across the lifespan.

Consistent with the earlier report *Women's Heath and Health Care Reform: The Key Role of Comprehensive Reproductive Health Care*, health care reform must therefore achieve three core goals:

1) Health insurance coverage must make care available, affordable and stable at the right time and in the right place;

2) Direct investments should be made in infrastructure and a qualified workforce; and

3) Public health investments should be made in community health promotion and surveillance.

In addition, a well-woman standard of care, providing access to essential health care services and established through the reform of our health care system, would ensure that women **attain good health in childhood and adolescence, maintain good health during their reproductive years and age well**.

References

ACOG Practice Bulletin. (2008). *Use of Psychiatric Medications during Pregnancy and Lactation*. Number 92, April.

Agency for Healthcare Research and Quality, USPSTF. (2006). The Guide to Clinical Preventive Services 2006: Recommendations of the U.S. Preventive Services Task Force.

Agency for Healthcare Research and Quality. (2008). *National Healthcare Disparities Report, 2008*. Available at: http://www.ahrq.gov/qual/nhdr08/Chap3.htm. Accessed June 1, 2009.

American Cancer Society. (2003). *Cancer Facts & Figures 2003*. Atlanta, GA.

American Diabetes Association. (2008). *Economic Costs of Diabetes in the U.S. in 2007*. Available at: http://care.diabetesjournals.org/cgi/content/abstract/31/3/596. Accessed: May 1, 2009.

American Diabetes Association. *Pre-Diabetes*. Available at: http://www.diabetes.org/pre-diabetes.jsp. Accessed May 1, 2009.

American Heart Association. (2009). *American Heart Association, Heart disease and stroke statistics - 2009 update: A report from the American Heart Association Statistics Committee and Stroke Statistics* Subcommittee, *Circulation.* 2009;119:e21-e181.

American Heart Association. *Women and Cardiovascular Diseases – Statistics 2009*. Available at: http://www.americanheart.org/downloadable/heart/1236184538758WOMEN.pdf. Accessed April 28, 2009.

American Society for Colposcopy and Cervical Pathology. *Practice Recommendations: The Cervix-Cervical Cancer Screening and Colposcopy During Pregnancy*. Available at: http://www.asccp.org/edu/practice/cervix/cervical.shtml. Accessed May 7, 2009.

Balu, S, and J Thomas III. (2006). Incremental expenditure of treating hypertension in the United States. *American Journal of Hypertension*; 19:810-816.

Bland, P, An, L, Foldes, S, Garrett, N, Alesci, NL. (2009). Modifiable health behaviors and short-term medical costs among health plan members. *American Journal of Health Promotion*. 23(4):265-73.

Breiding, Black, Ryan. (2008). Prevalence and risk factors of intimate partner violence in eighteen U.S. States/Territories, 2005. *American Journal of Preventive Medicine,* 34(2):112-118.

Breiding, MJ, Black, MC, Ryan, GW. (2008). Chronic disease and health risk behaviors associated with intimate partner violence—18 U.S. States/Territories, 2005. *Annals of Epidemiology.* 18(7): 538-544.

Broskowski, A., and Smith, S. (2001). *Estimating the Cost of Preventive Services in Mental Health and Substance Abuse Under Managed Care*. DHHS Pub. No. SMA-02-3617R. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration.

Buchanan, TA, Xiang, A, Kjos, SL, Lee, WP, Trigo E, Nader I, et al. (1998). Gestational diabetes: Antepartum characteristics that predict postpartum glucose intolerance and type 2 diabetes in Latino women. *Diabetes,* 47:1302–1310.

Burge, R, B Dawson, DH Solomon, JB Wong, A King, and A Tosteson. (2007). Incidence and economic burden of osteoporosis-related fractures in the United States, 2005-2025. *Journal of Bone and Mineral Research*; 22(3), 465-475.

Catalano, S. (2007). *Intimate Partner Violence in the United States*. U.S. Department of Justice. Available at: http://www.ojp.usdoj.gov/bjs/intimate/ipv.htm. Accessed May 14, 2009.

Centers for Disease Control and Prevention. (2000). Implementing recommendations for the early detection of breast and cervical cancer among low-income women. *Morbidity and Mortality Weekly Report.* 49(RR02);35-55. Available at: http://www.cdc.gov/mmwR/preview/mmwrhtml/rr4902a4.htm. Accessed May 7, 2009.

Centers for Disease Control and Prevention. (2002). Annual smoking-attributable mortality, years of potential life lost, and economic costs --- United States, 1995—1999. *Morbidity and Mortality Weekly Report.* 51(14); 300-3.

Centers for Disease Control and Prevention. (2005a). *United States Cancer Statistics: 2005 Cancer Types Grouped by Race and Ethnicity. Female Breast Cancer*. Available at: http://apps.nccd.cdc.gov/uscs/Table.aspx?Group=TableAll&Year=2005&Display=n. Accessed May 6, 2009.

Centers for Disease Control and Prevention. (2005b). Cigarette smoking among adults—United States, 2004. *Morbidity and Mortality Weekly Report*, 54(44): 1121–1124.

Centers for Disease Control and Prevention. (2006). *Women and Tobacco*. Available at: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/populations/women_tobacco.htm Accessed May 11, 2009.

Centers for Disease Control and Prevention. (2006b). *Preconception Health and Care.* Available at: http://www.cdc.gov/ncbddd/preconception/documents/At-a-glance-4-11-06.pdf. Accessed June 3, 2009.

Centers for Disease Control and Prevention. (2007). *Pregnancy and Childbirth*. Available at: http://www.cdc.gov/hiv/topics/perinatal/index.htm. Accessed May 11, 2009.

Centers for Disease Control and Prevention. (2008a). *Heart Disease Prevention: What You Can Do*. Available at: http://www.cdc.gov/heartdisease/prevention.htm. Accessed May 11, 2009.

Centers for Disease Control and Prevention. (2008b). *STDs and Pregnancy - CDC Fact Sheet*. Available at: http://www.cdc.gov/std/STDFact-STDs&Pregnancy.htm#Common. Accessed May 6, 2009.

Centers for Disease Control and Prevention. (2008c), *HIV/AIDS Among Women*. Available at: http://www.cdc.gov/hiv/topics/women/resources/factsheets/women.htm. Accessed May 11, 2009.

Centers for Disease Control and Prevention. (2008d). HIV prevalence estimates – United States, 2006. *Morbidity and Mortality Weekly Report*. 57(39); 1073-1076.

Centers for Disease Control and Prevention. (2009). *Overweight and Obesity*. Available at: http://www.cdc.gov/nccdphp/dnpa/obesity/index.htm. Accessed May 11, 2009.

Chavkin, W, Rosenbaum, S, et al. (2009). *Women's Health and Health Care Reform: The Key Role of Comprehensive Reproductive Health Care*. Columbia University Mailman School of Public Health. Available at: http://www.jiwh.org/attachments/Women%20and%20Health%20Care%20Reform.pdf. Accessed May 3, 2009.

Chesson, HW, Blandford, JM, Gift TL. et al. (2004). The estimated direct medical cost of sexually transmitted diseases among American youth. *Perspectives on Sexual and Reproductive Health*. 36(1):11-19.

Chou, AF, Scholle, SH, Weisman, C, et al. (2007). Gender disparities in the quality of cardiovascular disease care in private managed care plans. *Women's Health Issues*, 17(3):120-130.

Colman, GJ, Joyce, T. (2003). Trends in smoking before, during, and after pregnancy in ten states. *Am J Prev Med*;24:29–35.

Covington, S. (2007). Women and the criminal justice system. *Women's Health Issues*. 17(4):180-182.

Dall et al. (2008). Economic costs of diabetes in the U.S. in 2007. *Diabetes Care* 31:596-615.

Dennis, KE. (2007). Postmenopausal women and the health consequences of obesity. *Journal of Obstetric Gynecologic Neonatal Nursing*; 36(5) :511-7; quiz 518-9.

Department of Health and Human Services, Office on Women's Health. *Women's Health Moyer Table*, 2009.

Dornhorst, A, Rossi, M. (1998). Risk and prevention of type 2 diabetes in women with gestational diabetes. *Diabetes Care* 21 suppl:B43–B49.

Ettaro, L, TJ Songer, P. Zhang, MM Engelgau. (2004). Cost-of-illness studies in diabetes mellitus. *PharmacoEconomics;* 22(3).

Finkelstein,E, Fiebelkorn IC, Wang G. (2003). National medical spending attributable to overweight and obesity: How much and who's paying? *Health Affairs.* W3, 219-226.

Glied S, Jack K, Rachlin J. (2008). Women's health insurance coverage 1980-2005. *Women's Health Issues*; 18:7-16.

Gotlib IH, Whiffen VE, Mount JH, Milne K, Cordy NI. (1989). Prevalence rates and demographic characteristics associated with depression in pregnancy and the postpartum. *J Consult Clin Psychol* ;57:269–74.

Grosse, S., Teutsch, S., Haddix, A. (2007). Lessons from cost-effectiveness research for United States public health policy. *Ann Rev Public Health.* 28:365-391.

Gu, K, Cowie, CC, Harris, MI. (1999). Diabetes and decline in heart disease mortality in US adults. *JAMA*; 281:1291-7.

Hadley J. (2007). Insurance coverage, medical care use, and short-term health changes following an unintentional injury or the onset of a chronic condition. *JAMA*; 297(10):1073-84.

Hauenstein, E. J., Petterson, S., Merwin, E., Rovnyak, V., Heise, B., & Wagner, D. (2006). Rurality, gender, and mental health treatment. *Family & Community Health.* 29(3), 169-185.

Hogue, CJR. (2002). Toward a systematic approach to understanding—and ultimately eliminating—African-American women's health disparities. *Women's Health Issues.* 12(5): 222-237.

HSTAT: Guide to Clinical Preventive Services, 3rd Edition: Recommendations and Systematic Evidence Reviews, Guide to Community Preventive Services U.S. Preventive Services Task Force Evidence Syntheses. Interventions in Primary Care to Promote Breastfeeding: A Systematic Review. Available at: http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat3. Accessed April 22, 2009.

Insinga, R, Dasbach, E, Elbasha, E. (2005). Assessing the annual economic burden of preventing and treating anogenital Human Papillomavirus-related disease in the U.S. *Pharmacoeconomics,* 23(11):1107-1122.

Jemal, A, Thun, M, Ries, L, Howe, H, Weir, H, Center, M, et al. (2008). Annual report to the nation on the status of cancer, 1975-2005, featuring trends in lung cancer, tobacco use, and tobacco control. *J Natl Cancer Inst,* 100:1672-1694.

Jesse, DE, Graham, M., Swanson, M. (2006). Psychosocial and spiritual factors associated with smoking and substance use during pregnancy in African American and White low-income Women. JOGNN, 35, 68-77.

Johnson, K, Atrash, H, Johnson A. (2008). Policy and financing issues for preconception care: Opportunities for today and the future. *Women's Health Issues* 18(6s).

Kaiser Family Foundation. (2005). *Women and Health Care: A National Profile*. Available at: http://www.kaiserfamilyfoundation.org/womenshealth/upload/Women-and-Health-Care-A-National-Profile-Key-Findings-from-the-Kaiser-Women-s-Health-Survey-Report-Highlights.pdf. Accessed May 1, 2009.

Kaiser Family Foundation. (2006). *Women and HIV/AIDS in the United States*. Available at: http://www.kff.org/hivaids/upload/6092-03.pdf Accessed May 1, 2009.

Kaiser Family Foundation. (2007). *Maternity Care and Consumer-Driven Health Plans*. Available at: http://www.kff.org/womenshealth/upload/7636ES.pdf. Accessed May 4, 2009.

Kaiser Family Foundation. (2008). *Women's Health Insurance Coverage Fact Sheet*. Available at: http://www.kff.org/womenshealth/upload/6000_07.pdf. Accessed June 1, 2009.

Kessler, RC, Berglund, P, Demler, O, Jin, R, Koretz, D, Merikangas, KR, et al. (2003). "The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *JAMA*, 289:3095-3105.

Kessler, RC, Berglund, P, Demler, O, Jin R, Merikangas, KR, Walters, EE. (2005a). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry.* 2005; 62:593-602.

Kessler, RC, Chiu, WT, Demler, O, Walters, EE. (2005b).Prevalence, severity, and comorbidity of 12-Month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry,* 62:617-627.

Koonin, LM, MacKay, AP, Berg, CJ, Atrash, HK, Smith, JC. (1997). Pregnancy-related mortality surveillance—United States, 1987–1990. *Mor Mortal Wkly Rep CDC Surveill Summ,* 46(4):17–36.

Lipsky S, R Caetano, P Roy-Byrne. (2009). Racial and ethnic disparities in police-reported intimate partner violence and risk of hospitalization among women. *Women's Health Issues*, 19(20); 109-117.

Looker, AC, Wahner, HW, Dunn, WL, Calvo, MS, Harris, TB, Heyse, SP, et al. (1998). Updated data on proximal femur bone mineral levels of U.S. adults. *Osteoporos Int* 8: 468–89. (Level III).

March, J, Silva, S, Petrycki, S, et al. (2004). Treatment for Adolescents with Depression Study (TADS) team. Fluoxetine, cognitive-behavioral therapy, and their combination for adolescents with depression: Treatment for Adolescents with Depression Study (TADS) randomized controlled trial. *Journal of the American Medical Association*, 292(7): 807-820.

Martin, JA, Hamilton , BE, Sutton , PD, Ventura, SJ, Menacker F, Munson , ML. (2003). *Births: Final Data for 2002*. *National Vital Statistics Reports, 52* , 1-114, Tables. Hyattsville, MD: National Center for Health Statistics.

McKinnon, R. (2009). *Obesity as Market Failure: Development of a Model to Estimate the Lifetime, External Costs of Obesity in the United States*. Doctoral dissertation, The George Washington University, 2009.

Melton III, LJ. (2002). *Prevalence and Burden of Illness, Report of the Surgeon General's Workshops on Osteoporosis and Born Health*. Available at: http://www.surgeongeneral.gov/topics/bonehealth/workshop_report/workshop_rpt.htm#Melton. Accessed May 1, 2009.

Mannino, DM, Homa DM, Akinbami, LJ, Ford, ES, Redd, SC. (2002). Chronic obstructive pulmonary disease surveillance – United States,1997-2000. *Surveillance Summaries*. 51(SS06);1-16.

Narayan et al. (2003). Lifetime risk for diabetes mellitus in the United States. *JAMA,* 290:1884-1890.

National Center for Health Statistics. Health United States, 2007, With Chart book on Trends in the Health of Americans, Hyattsville, MD. 2009.

National Center for Health Statistics. Health United States, 2008, With Chart book on Trends in the Health of Americans, Hyattsville, MD. 2009.

National Cancer Institute. "Breast Cancer Snapshot." September 2008.

National Diabetes Clearinghouse (2008). *Diabetes Prevention Program*. NIH Publication No. 09–5099. Available at: http://diabetes.niddk.nih.gov/dm/pubs/preventionprogram/#type. Accessed May 15, 2009.

National Institute of Child Health and Human Development. (2008). *Gestational Diabetes*. Available at: http://www.nichd.nih.gov/health/topics/Gestational_Diabetes.cfm, Accessed on May 13, 2009.

National Osteoporosis Foundation. *America's Bone Health*. 2002.

National Women's Law Center. (2009). *Nowhere to Turn: How the Individual Health Insurance Market Fails Women*.

Nayak MB, Al-Yattama M. (1999). Assault victim history as a factor in depression during pregnancy. *Obstetrics & Gynecology,* 94:204–8.

Neuschler, E. (2004). *Institute for Health Policy Solutions, Policy Brief on Tax Credits for the Uninsured and Maternity Care*, prepared for the March of Dimes. Available at: http://www.marchofdimes.com/TaxCreditsJan2004.pdf. Accessed May 5, 2009.

NHLBI. (2007). *Direct and Indirect Economic Costs of Illness by Major Diagnosis,* U.S., 2007.

NIH. *Cancer Trends Progress Report – 2007 Update*. Available at: http://progressreport.cancer.gov/doc_detail.asp?pid=1&did=2007&chid=76&coid=730&mid=#life.

Ogden, C, Carroll, M, Curtin, L, McDowell, M, Tabak, C, Flegal, K. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA,* 295: 1549-1555.

Patchias, EM and Waxman J. (2007). *Women and Health Coverage: The Affordability Gap*. The Commonwealth Fund and the National Women's Law Center. Available at: http://www.nwlc.org/pdf/NWLCCommonwealthHealthInsuranceIssueBrief2007.pdf. Accessed May 3, 2009.

Robinson K. (2007). *Trends in Health Status and Health Care Use Among Older Women*. U.S. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. Aging Trends No. 7.

Rustgi, S, Doty, M, Collins, S. (2009). *Women at Risk: Why Many Women Are Forgoing Needed Health Care*. The Commonwealth Fund.

Salihu HM, Aliyu MH, Pierre-Louis BJ, Alexander GR. (2003). Levels of excess infant deaths attributable to maternal smoking during pregnancy in the United States. *Matern Child Health J,* 7:219–27.

Sankaranarayanan R, Budukh AM, Rajkumar R. (2001). Effective screening programmes for cervical cancer in low- and middle-income developing countries. *Bull World Health Organ* 79: 954–62.

Schwarz, E, Ray,R, Stuebe, A, et al. (2009). Duration of lactation and risk factors for maternal cardiovascular disease. *Obstetrics and Gynecology.* 113(5):974-982.

Sirovich, B, Welch, H. (2004). The frequency of Pap Smear screening in the United States. *J Gen Intern Med.*19:243–250.

Steben M., Duarte-Franco E. (2007). Human Papillomavirus infection: Epidemiology and pathophysiology. *Gynecologic Oncology.* 107:S2–S5.

Sturm R. (2002). The effects of obesity, smoking, and drinking on medical problems and costs. *Health Affairs*. Mar-Apr; 21(2):245-53.

Surgeon General's Report. (2004). The Health Consequences of Smoking.

Thorpe K, Florence C, Howard D, Joski P. (2004). The impact of obesity on rising medical spending. *Health Affairs*. Jul-Dec; Suppl W4-480-6.

U.S. Cancer Statistics Working Group. (2009). *United States Cancer Statistics: 1999–2005 Incidence and Mortality Web-based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute.

U.S. Census Bureau. (2007). *Annual Estimates of Population by Sex, Age and Hispanic Origin for the United States*: April 1, 2000 to July 1, 2007 (NC-EST2007-04). Accessed on line, June 2nd. Available at: http://www.census.gov/popest/national/asrh/NC-EST2007-asrh.html.

U.S. Department of Health and Human Services, (2001). *Women and Smoking: A Report of the Surgeon General*, U.S. Department of Health and Human Services, Public Health Service, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

U.S. Department of Health and Human Services, Office for Women's Health. (2009). *The Healthy Woman*: *A Complete Guide for All Ages*. Washington DC.

U.S. Department of Health and Human Services. (HHS). (undated). *Achieving a Heart-Healthy and Stroke-Free Nation: The Burden of Heart Disease and Stroke in the United States*. Available at: http://www.healthierus.gov/STEPS/summit/prevportfolio/strategies/reducing/heart/burden.htm.

U.S. Department of Health and Human Services and U.S. Department of Agriculture. (2005). *Dietary Guidelines for Americans, 2005*. 6th Edition, Washington, DC: U.S. Government Printing Office, January.

U.S. Department of Health and Human Services, Health Resources and Services Administration, *Women's Health USA 2007*, Rockville Maryland: US Department of Health and Human Services.

U.S. Department of Health and Human Services, Office on Women's Health. (HHS). (undated). *General Screenings and Immunizations for Women*. Available: http://www.womenshealth.gov/screeningcharts/general/general.pdf. Accessed May 1, 2009.

U.S. Department of Health and Human Services (HHS). (2009). *Summary Health Statistics for U.S. Adults: National Health Interview Survey*. Vital and Health Statistics series 10(235).

U.S. Department of Labor, Bureau of Statistics. (2009). *Consumer Price Index - All urban consumers (CPI-U), US city average (all items, 1982-84=100)*. Available at: at ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt. Accessed June 5, 2009.

U.S. Preventive Services Task Force. The Guide to Clinical Preventative Services (2008), Available at: http://www.ahrq.gov/clinic/pocketgd08/pocketgd08.pdf. Accessed May 1, 2009.

Ventura, S, Hamilton, B, Mathews, T, Chandra, A. (2003). Trends and variations in smoking during pregnancy and low birth weight: evidence from the birth certificate, 1990-2000. *Pediatrics*. 111:1176–80.

Walker JJ. (2000). Pre-eclampsia. *Lancet.* 356:1260–1265.

Weissman M, Olfson M. (1995). Depression in women: implications for health care research. *Science*. 269: 799–801.

Whitaker R, Dietz W. (1998). Role of the prenatal environment in the development of obesity. *Journal of Pediatrics* 132(5):768-776.

Wisner K, Sit D, Hanusa B, et al. (2009). Major depression and antidepressant treatment: Impact on pregnancy and neonatal outcomes. *American Journal of Psychiatry*. 166(5):557-66.

World Health Organization (2003). *State of the Art New Vaccines: Research and Development*. Initiative for Vaccine Research, Geneva. Available at: http://www.who.int/vaccine_research/documents/en/stateofart_excler.pdf.   Accessed May 1, 2009.