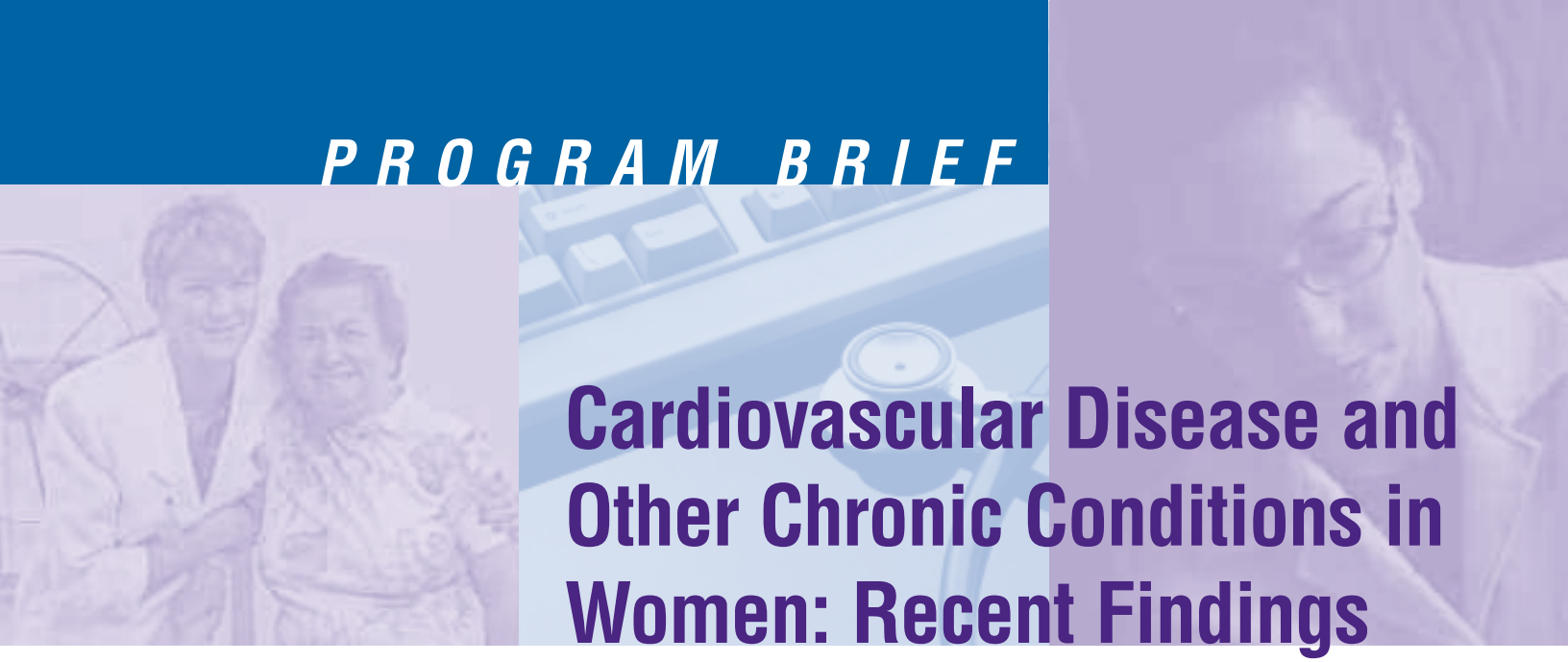
PROGRAM BRIEF



Cardiovascular Disease and Other Chronic Conditions in Women: Recent Findings

The mission of AHRQ is to improve the quality, safety, efficiency, and effectiveness of health care by:

- Using evidence to improve health care.
- Improving health care outcomes through research.
- Transforming research into practice.

Introduction

Cardiovascular disease (CVD) is the number one killer of women in the United States. Long thought of as primarily affecting men, we now know that CVD—including heart disease, hypertension, and stroke—also affects a substantial number of women. Experts estimate that one in two women will die of heart disease or stroke, compared with one in 25 women who will die of breast cancer.

In addition to cardiovascular disease, other chronic illnesses affecting women include diabetes, obesity, hypertension, osteoporosis, depression and other mental illness, and HIV/AIDS. AHRQ researchers are seeking ways to help women understand and manage their chronic conditions and achieve a better quality of life.

AHRQ-Sponsored Research

The Agency for Healthcare Research and Quality (AHRQ) supports a vigorous women's health research program, including research focused on CVD and other chronic illnesses. AHRQ-supported projects are addressing women's access to quality health care services, accurate diagnoses, appropriate referrals for procedures, and optimal use of proven therapies.

This program brief summarizes findings from AHRQ-supported research on cardiovascular disease and chronic illness in women published from 2006-2009. An asterisk (*) at the end of a summary indicates that reprints of an intramural study or copies of other publications are available from AHRQ.

See the back cover of this program brief to find out how you can get more detailed information on AHRQ's research programs and funding opportunities.

Cardiovascular Disease

Recent statistics show significant differences between men and women in survival following a heart attack. For example, 42 percent of women who have heart attacks die within 1 year compared with 24 percent of men. The

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reasons for these differences are not well understood. We know that women tend to get heart disease about 10 years later in life than men, and they are more likely to have coexisting chronic conditions. Research also has shown that women may not be diagnosed or treated as aggressively as men, and their symptoms may be very different from those of men who are having a heart attack.

- *Association found between cardiac problems and prior use of a certain type of breast cancer drug.*

According to this 16-year study of nearly 20,000 women with breast cancer, those who received chemotherapy that included anthracycline had a higher incidence of congestive heart failure, cardiomyopathy, and dysrhythmia than women who received other kinds of chemotherapy or no chemotherapy. For example, the probability of experiencing congestive heart failure in year 10 was 32 percent for women who received anthracycline, compared with 26 percent for women who received other types of chemotherapy and 27 percent for those who received no chemotherapy. Du, Siz, Liu, et al., *Cancer* 115(22):5296-5308, 2009 (AHRQ grant HS16743).

- *Women are more likely than men to experience delays in emergency care for cardiac symptoms.*

Researchers examined time-to-treatment for 5,887 individuals with suspected cardiac symptoms who made a 911 call in 2004. They found that, on average, women arrived at the hospital 2.3 minutes slower than men. Factors increasing the likelihood of delay included evening rush hour travel, bypassing a local hospital, and living in a densely populated neighborhood. Even after adjustments were made for these factors, women were significantly more likely than men to be delayed. Concannon, Griffith, Kent, et al., *Circ Cardiovasc Qual Outcomes* 2:9-15, 2009 (AHRQ grants HS10282, T32 HS00060).

- *Postmenopausal women with metabolic syndrome are at increased risk for a cardiovascular event.*

Researchers used data on 372 postmenopausal women to investigate the effects and usefulness of applying two competing clinical definitions of metabolic syndrome to identify women at high risk of future heart attacks or stroke. Metabolic syndrome—a combination of high blood pressure, elevated blood glucose, abnormal lipid levels, and increased waist size—is known to be associated with elevated risk for heart attack and stroke. Overall, women who met at least one of the definitions for metabolic syndrome were significantly more likely to experience a cardiovascular event than those who did not, and there was no difference between the two definitions in their predictive ability. Brown, Vaidya, Rogers, et al., *J Womens Health* 17(5):841-847, 2008 (AHRQ grant HS13852).

- *Aspirin therapy to prevent heart attack may have different benefits and harms in men and women.*

The U.S. Preventive Services Task Force reviewed new evidence from NIH's Women's Health Study and other recent research and found good evidence that aspirin decreases first heart attacks in men and first strokes in women. The Task Force has issued a recommendation that women between the ages of 55 and 70 should use aspirin to reduce their risk for ischemic stroke when the benefits outweigh the harms for potential gastrointestinal bleeding. The recommendation and

other materials are available at www.ahrq.gov/clinic/uspstf/uspsasmi.htm. U.S. Preventive Services Task Force, *Ann Intern Med* 150(6):396-404, 2009 (AHRQ supports the Task Force). See also Optowsky, McWilliams, and Cannon, *J Gen Intern Med* 22:55-61, 2007 (AHRQ grant T32 HS00020).

- *Women are more likely than men to be hospitalized for unexplained chest pain.*

Data show that in 2006, there were 477,000 admissions of women to U.S. hospitals for unspecified chest pain—feeling of pressure, burning, or numbness—compared with 379,000 admissions for men. Although it is not clear why women receive this diagnosis more than men, there is some evidence that heart disease develops differently in women and men, and their symptoms may differ. See *HCUP Facts and Figures 2006*, online at http://www.hcup-us.ahrq.gov/reports/factsandfigures.jsp (Intramural).

- *Female and black stroke patients are less likely than others to receive care to prevent subsequent strokes.*

A third of stroke survivors suffer another stroke within 5 years, but there are several therapies to prevent further strokes in these patients. According to this study of 501 patients hospitalized for stroke, 66 percent of women and 77 percent of blacks received incomplete inpatient evaluations, compared with 54 percent of men and 54 percent of whites. Also, women were more likely than men to receive incomplete discharge regimens (anticoagulants and other stroke prevention medications and outpatient followup). Tuhrim, Cooperman, Rojas, et al., *J Stroke Cerebrovasc Dis* 17(4):226-234, 2008 (AHRQ grant HS10859).

- *Process-of-care variables may explain some of the male-female differences in cardiovascular disease outcomes.*

Researchers analyzed seven cardiovascular disease quality of care indicators in a national sample of managed care plans and found inadequate lipid control in both men and women, with a lower rate of control in women. Also, women with diabetes were 19 percent less likely than men to have their LDL cholesterol controlled; women with a history of CVD were 28 percent less likely than men to have their LDL cholesterol controlled. More women than men had their blood pressure controlled, although the difference was small (2 percent). Chou, Scholle, Weisman, et al., *Women's Health Issues* 17:120-130, 2007 (AHRQ contract 290-04-0018).

- *Commercial health plans show disparities between women and men in cardiovascular care.*

Researchers evaluated plan-level performance of seven quality of care measures for CVD and found that over half of the plans showed a disparity of 5 percent or more in favor of men for cholesterol control measures among people with diabetes, a recent CVD procedure, or heart attack. The greatest disparity (9.3 percent in favor of men) was among those with recent acute cardiac events; none of the plans showed disparities in favor of women. Disparities between women and men were even greater among Medicare managed care plans. Chou, Wong, Weisman, et al., *Women's Health Issues* 17:139-149, 2007 (AHRQ contract 290-04-0018). See also Bird, Fremont, Bierman, et al., *Women's Health Issues* 17:131-138, 2007 (AHRQ contract 290-00-0012).

- *Among heart disease patients, women are less likely than men to use low-dose aspirin therapy.*

Use of a low-dose aspirin regimen reduces the risk of heart attack, stroke, and other vascular events and reduces heart disease deaths. Although daily aspirin is recommended for all patients with cardiovascular disease unless contraindicated, women with heart disease are less likely than men with heart disease to use aspirin regularly, according to this study. Researchers examined data on 1,869 men and women aged 40 or older who reported heart disease prior to a heart attack. After adjusting for demographic, socioeconomic, and clinical characteristics, 62 percent of women reported regular aspirin use, compared with 76 percent of men. Opotowsky, McWilliams, and Cannon, *J Gen Intern Med* 22:55-61, 2007 (AHRQ grant T32 HS00020).

- *Women continue to fare worse than men in treatment for heart attack and congestive heart failure.*

According to this study of gender disparities among adults age 65 and older, women with acute myocardial infarction (AMI) or congestive heart failure (CHF) do not receive the same care as men. Also, women or men who have other medical conditions associated with AMI or CHF—such as diabetes, hypertension, or end-stage renal disease—do not receive better quality of cardiovascular care than those who have only the heart conditions. Correa-de-Araujo, Stevens, Moy, et al., *Women's Health Issues* 16(2):44-55, 2006 (AHRQ Publication No. 06-R042)* (Intramural).

- *Immunosuppression related to transfusion may explain women's increased risk of dying after CABG surgery.*

A study of more than 9,000 Michigan Medicare patients found that women undergoing coronary artery bypass graft (CABG) surgery were 3.4 times as likely as men to have received blood transfusions and generally received more units of blood, after accounting for age, coexisting conditions, and other factors. Patients who received a transfusion were more than three times as likely to develop an infection as those who did not, and they were 5.6 times as likely to die within 100 days after surgery. The presence of foreign leukocytes in donor blood may suppress the immune system of the recipient and thus increase the risk of postoperative infection, note the researchers. Rogers, Blumberg, Saint, et al., *Am Heart J* 152:1028-1034, 2006 (AHRQ grant HS11540).

- *Management of chest pain differs by sex and race.*

Researchers analyzed the care of 72,508 people with hypertension who were treated at about 50 primary care practices in the Southeastern United States. More men than women received definitive diagnoses of angina, while more women than men were diagnosed with vague chest pain. Also, women and blacks received fewer cardiovascular medications than men and whites. Hendrix, Mayhan, Lackland, and Egan, *Am J Hypertens* 18(8):1026-1032, 2005 (AHRQ grant HS10871).

Chronic Illness

Chronic illnesses, such as diabetes, obesity, stroke, hypertension, osteoporosis, depression, and HIV/AIDS, usually are long-lasting and affect all aspects of a woman's life.

- *Women account for almost 90 percent of all hospital stays for injuries related to osteoporosis.*

An estimated 10 million Americans suffer from osteoporosis, and women are four times as likely as men to be diagnosed with the condition. In 2006, the rate of hospitalization for an injury related to osteoporosis was 149 stays per 100,000 population, compared with 20 stays per 100,000 population for men—a rate more than six times as high for women as for men. See *U.S. Hospitalizations Involving Osteoporosis and Injury, 2006*, HCUP Statistical Brief No. 76; online at http://www.hcup-us.ahrq.gov/reports/statbriefs/sb76.pdf (Intramural).

- *Medicare reimbursement for bone density scans varies by diagnosis codes and Medicare carrier.*

Researchers analyzed Medicare claims data from 1999 to 2005 for a 5 percent national sample of enrollees with part A and part B coverage who were not in HMOs to analyze denial of Medicare coverage for bone density (DXA) scans. They found that although Medicare reimbursement for DXA is covered as part of the "Welcome to Medicare" exam and for certain indications (e.g., screening for estrogen-deficient women and conditions that lead to bone loss), DXA claims were denied from 5 to 43 percent of the time. Variations in reimbursement were related to diagnosis code submitted, place of service, local Medicare carrier, and several other factors. Curtis, Laster, Becker, et al., *J Clin Densitom* 11(4):568-574, 2008 (AHRQ grant HS16956).

- *Millions of women are treated for high blood pressure each year.*

According to an analysis of data from AHRQ's Medical Expenditure Panel Survey (MEPS), approximately 25 million women in the United States—most older than 45—were treated for high blood pressure in 2006, making it the most common condition for which women sought treatment that year. The other most common conditions for which women sought treatment that year, by age group, included: for age 65 and older, hyperlipidemia, osteoarthritis, heart disease, and chronic obstructive pulmonary disease (COPD); ages 45-65, depression, COPD and asthma, hyperlipidemia, and osteoarthritis; ages 30-44, depression, COPD and asthma, female genital disorders, and bronchitis. See http://www.meps.ahrq.gov/mepsweb/data_stats/MEPS_topics.jsp?topicid=18Z-1 (Intramural).

- *Lupus involves higher health care costs and leads to lower work productivity.*

In this study of 812 individuals diagnosed with systemic lupus erythematosus (SLE), researchers found that direct health care costs for each person were $12,643, and their employment rate dropped from 76.8 percent of individuals at the time of diagnosis to 48.7 percent at study enrollment. The majority of study participants (92.6 percent) were female, since lupus most often affects women. Panopalis, Yazdany, Gillis, et al., *Arthritis Rheum* 59(12):1788-1795, 2008 (AHRQ grant HS13893).

- *Socioeconomic status is related to physical and mental health outcomes of women with lupus.*

Researchers examined data on 957 patients with lupus to assess symptoms, physical functioning, and signs of

depression, as well as neighborhood and socioeconomic status (SES). The majority of patients were female (91 percent) and white (66 percent). Three factors were associated with increased disease activity: lower education level, lower income level, and poverty status. There was a significant association between lower SES, worse functioning, and increased depressive symptoms. Patients who were poor and living in high poverty neighborhoods had a depression rate of 76 percent, compared with 32 percent for patients who were not poor and did not live in high poverty areas. Trupin, Tonner, Yazdany, et al., *J Rheumatol* 35(9):1782-1788, 2008 (AHRQ grant HS13893).

- *Mycobacterial pulmonary disease affects more women than men.*

Nontuberculous mycobacteria (NTM) are an important cause of disease and death, most often in the form of progressive lung disease. Long thought to be more common in men, this study found that the epidemiology of this disease has changed in the last several decades, and it now affects women more often than men. Of the 933 patients with NTM isolated by culture, 56 percent met the microbiologic criteria for NTM disease. Pulmonary cases predominated, and skin/soft tissue infections were the second most common form of NTM disease. Cassidy, Hedberg, Saulson, et al., *Clin Infect Dis* 49:e124-e129, 2009 (AHRQ grant HS17552).

- *Report describes quality of care and outcomes for women with diabetes.*

This report, prepared by AHRQ and the Centers for Disease Control and Prevention, presents measures for quality of care and outcomes for women with diabetes. It highlights where the American health care system excels with regard to diabetes care and where the greatest opportunities for improvement lie. For example, women with diabetes were less likely than women without diabetes to have their blood pressure controlled or to have had a dental visit in the preceding 12 months. Among younger women (64 or younger), women with diabetes were significantly more likely than women without diabetes to have only public health insurance. On the other hand, women with diabetes were much more likely than women without diabetes to have received an annual flu vaccination and to have ever received a vaccination for pneumonia. *Women with Diabetes: Quality of Health Care, 2004-2005* (AHRQ Publication No. 08-0099)* (Intramural).

- *Analysis reveals that many women and men with diabetes are not receiving recommended care.*

According to this analysis of 10 quality of care measures—as defined by the National Health Care Quality and Disparities Reports—only 29 percent of women and 34 percent of men with diabetes receive the five care processes recommended for people with diabetes: regular blood sugar measurement, regular eye exams, regular foot exams, flu vaccination each year, and lipid profile every 2 years. Avoidable hospitalizations for diabetes complications decrease as income and education increase among women across all racial and ethnic groups. Correa-de-Araujo, McDermott, and Moy, *Women's Health Issues* 16(2):56-65, 2006 (AHRQ Publication No. 06-R043)* (Intramural).

- *Having a chronic disease may be a barrier to receipt of recommended preventive care among women.*

Researchers used data from three nationally representative surveys to examine the quality of care received by

women with diabetes and the impact of socioeconomic factors on receipt of clinical preventive services and screening for diabetes-related conditions. They found that use of diabetes-specific preventive care among women is low, and that women aged 45 and younger and those with low educational levels were the least likely to receive recommended services. Also, women with diabetes were less likely than other women to receive a Pap smear, and those who were poor and minority were less likely than more affluent and white women to receive the pneumonia vaccine. Owens, Beckles, Ho, et al., *J Women's Health* 17(9):1415-1423, 2008 (AHRQ Publication No. 09-R018)* (Intramural).

- *Osteoporosis and low bone density affect many postmenopausal women.*

Although osteoporosis affects both women and men, it occurs most often in postmenopausal women. It increases bone fragility and susceptibility to fracture; each year in the United States, about 1.5 million people experience a fracture related to osteoporosis. These three documents present information about osteoporosis and low bone density. Comparative Effectiveness of Treatments to Prevent Fractures in Men and Women with Low Bone Density or Osteoporosis presents a review of the evidence comparing the efficacy and safety of agents used to treat low bone density (AHRQ Publication No. 08-EHC008-1). Fracture Prevention Treatments for Postmenopausal Women with Osteoporosis: Clinician's Guide presents information for doctors and other providers on the effectiveness and safety of various treatments for preventing fractures in postmenopausal women (AHRQ Publication No. 08-EHC008-3). *Osteoporosis Treatments that Help Prevent Broken Bones: A Guide for Women After Menopause* describes the effectiveness, side effects, and costs of the various treatments for low bone density (AHRQ Publication 08-EHC008-2A).* These publications are also available on the AHRQ Web site at http://effectivehealthcare.ahrq.gov/.

- *Women with HIV receive poorer quality of care than men with HIV.*

Critical health care services for women infected with HIV continue to lag behind services for men with HIV, according to this study. Researchers examined data on care provided to more than 9,000 patients at HIV clinics and found that women were less likely than men to receive highly active antiretroviral therapy (78 vs. 82 percent, respectively) or prophylaxis for pneumonia (65 vs. 75 percent, respectively). They also were less likely than men to have been assessed for their hepatitis C virus status (87 vs. 88 percent, respectively). Hirschhorn, McInnes, Landon, et al., *Women's Health Issues* 16:104-112, 2006 (AHRQ grants HS10227, HS10408).

- *Management of gout differs for women and men.*

About 5 million Americans suffer from gout, a painful inflammation of the joints. According to this study, factors leading to gout, as well as its management, are different in women and men. Researchers examined data on 1.4 million members of seven managed care plans from 1999 to 2003 and identified 6,133 adult members with gout. Women with gout were older than men (mean age of 70 vs. 58), had a greater number of coexisting medical conditions, and received diuretics more often (77 vs. 40 percent), respectively. Harrold, Yood, Mikuls, et al., *Ann Rheum Dis* 65:1368-1372, 2006 (AHRQ grants HS10391, HS10389).

- *Study details association between maternal asthma and smoking and bronchiolitis in infants.*

Researchers studied hospitalizations for bronchiolitis among infants of 100,000 women enrolled in the Tennessee Medicaid program during 1995-2003. They found that infants of mothers who smoked and had asthma were twice as likely to end up in the emergency department (ED) with bronchiolitis as infants whose mothers had neither problem. Infants whose mothers had only one of the problems had a lower but still significantly elevated risk for ED visits and hospitalizations compared with infants whose mothers had neither problem. Although maternal asthma was the most important of these two risk factors, infants were 50 percent more likely to be hospitalized for bronchiolitis if their mothers had asthma and also smoked. Carroll, Gebretsadik, and Griffin, *Pediatrics* 119(6):1104-1112, 2007 (AHRQ grant HS10384).

- *Pregnant minority women with asthma are at increased risk for poor outcomes.*

Among pregnant women with asthma, this study found that minority women have significantly higher rates of preterm labor, gestational diabetes, and infection of the amniotic cavity than white women. Black women were the youngest (age 24) and had the highest incidence of preterm labor (5.5 percent) and pregnancy-induced hypertension (5 percent). Asian women had the highest occurrence of gestational diabetes (7.2 percent) and were more than three times as likely as white women to have infection of the amniotic cavity (5.7 vs. 1.8 percent, respectively). Black and Hispanic women also had more infections of the amniotic cavity (3.1 and 2.7 percent,

respectively) than white women. Findings are based on examination of 11 adverse outcomes across four ethnic groups of 13,900 pregnant women with asthma who gave birth in 1998 and 1999. MacMullen, Tymkow, and Shen, *Am J Matern Child Nurs* 31(4):263-268, 2006 (AHRQ grant HS13506).

- *Many osteoporosis medications prevent fractures, but none has been shown to be best.*

According to this report, not enough scientific evidence exists to establish whether bisphosphonates (the most commonly used osteoporosis drugs) are better at preventing fractures than estrogen, calcitonin, or raloxifene. The report also indicates that many osteoporosis patients stop taking their medications as prescribed. Some stop because they do not have osteoporosis symptoms; others stop because of medication side effects or because dosing is too frequent. Not taking medications as prescribed increases the risk of bone fractures. *Comparative Effectiveness of Treatments to Prevent Fractures in Men and Women with Low Bone Density or Osteoporosis*, Comparative Effectiveness Review No. 12, 2007; online at www.effectivehealthcare.ahrq.gov (AHRQ contract 290-02-0003).

Mental/Behavioral Health

- *Psychological distress may cause women to delay getting regular medical care.*

The stress of juggling work and family roles may lead some women to delay or skip regular preventive care, such as routine physicals, mammograms, and other screening tests. In this study of 9,166 women aged 18-49, over 13 percent of them reported experiencing signs of psychological distress, including feeling nervous, hopeless, restless, fidgety, or depressed. These distressed women were more likely to delay getting health care than women who did not have distress symptoms (27 percent vs. 22 percent, respectively). Bonomi, Anderson, Reid, et al., *Arch Intern Med* 169(18):1692-1697, 2009 (AHRQ grant HS10909).

- *Nearly two-thirds of mothers with depression do not receive adequate treatment for their condition.*

Nearly 10 percent of the 2,130 mothers in this study reported experiencing depression. More than one-third of those with depression did not receive any treatment for their condition, 27.3 percent received some treatment, and just 35 percent received adequate treatment for depression. Mothers who received treatment were more likely than other mothers to be age 35 or older, white, and have some college education, and they were less likely to be in the paid workforce. Surprisingly, more than 80 percent of mothers who did not receive any treatment for their depression reported having insurance. Witt, Keller, Gottlieb, et al., *J Behav Health Serv Res* online at http://jbhsr.fmhi.usf.edu/toc/36.html, 2009 (AHRQ grants T32 HS00063, T32 HS00083).

- *Dysthymia may be a barrier to use of recommended HIV medications by women.*

Dysthymia—a chronic, low-level daily depression that lasts at least 2 years—is prevalent among women and minorities with HIV and may be a barrier to their use of highly active antiretroviral therapy (HAART). The feelings of hopelessness, indecision, and mental inflexibility that commonly occur in people with dysthymia could reduce the likelihood that they would be offered or accept HAART, according to this study. Researchers analyzed 1997 data on 1,982 adults with HIV; white men were the most likely to receive HAART (69 percent), while Hispanic women (53 percent) and black women (55 percent) were the least likely to receive this life-saving therapy. Turner and Fleishman, *J Gen Int Med* 21:1235-1241, 2006 (AHRQ Publication No. 07-R021)* (Intramural).

- *Nearly half of homeless women are in need of mental health services.*

Researchers conducted face-to-face interviews with 821 homeless women in the Los Angeles area, and found that nearly half of the women had a mental distress score indicating the need for further evaluation and possible clinical intervention. Sixty-seven percent of the women were black, 17 percent were Hispanic, and 16 percent were white. Black women reported the lowest overall mental distress scores; nearly twice as many white women as Hispanic or black women reported childhood or recent physical or sexual assault. Austin, Andersen, and Gelberg, *Women's Health Issues* 18:26-34, 2008 (AHRQ grant HS08323).

- *Study reveals differences between male and female providers in behavioral counseling.*

According to this study, female providers are more likely than male providers to counsel depressed patients about anxiety and less likely to provide counseling on alcohol or drug use. Also, female patients are less likely than male patients to be counseled by providers of either sex. Male patients of male providers reported the most counseling, and female patients of female providers reported the least counseling about alcohol or drug use. Rates of depression diagnosis and care were comparable regardless of the provider's sex or whether the provider and patient were of the same sex. Chan, Bird, Weiss, et

al., *Women's Health Issues* 16:122-132, 2006 (AHRQ grant HS08349).

- *Longitudinal study identifies patterns of tobacco use among young women.*

Researchers conducted a study of 443 Midwestern women who smoke, beginning in 1980, with followup in 1987, 1993, and 1999. They identified three subgroups among the women who smoked daily: the first group (48 percent) worked full time, were heavy smokers, and were generally happy. The second group (19 percent) started smoking casually in college and exercised regularly. The third group (33 percent) were mothers who smoked because they were addicted and received a psychological boost from smoking. Identifying these groups may help in tailoring smoking cessation interventions and messages appropriate for reaching them. Rose, Chassin, Presson, et al., *Addiction* 102(8):1310-1319, 2007 (AHRQ grant HS14178).

More Information

For more information on AHRQ initiatives related to women's health, please contact:

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