



**THE HEALTH  
OF AMERICA**  
R E P O R T

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# Disparities Identified in Post-Heart Attack Treatment between Women and Men

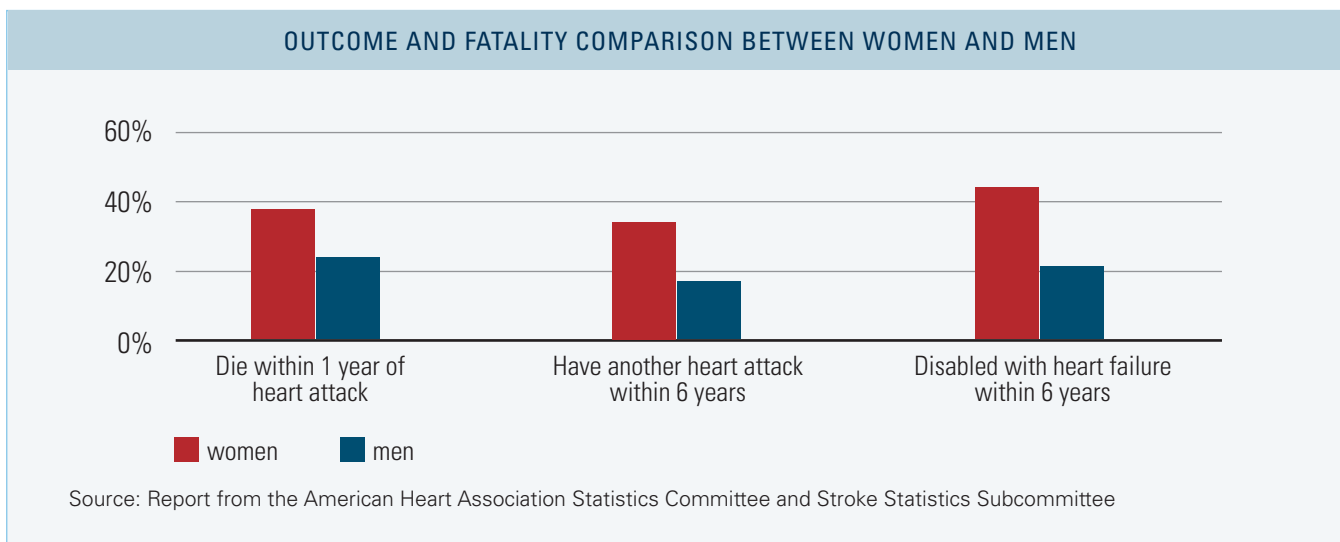
SEPTEMBER 2015

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## INTRODUCTION

As healthcare moves towards personalized or precision medicine, the differences between women and men should play an increasingly important role in diagnosis and treatment. To explore the potential impact of these differences in healthcare, this report analyzed medical claims from Blue Cross and Blue Shield (BCBS) members to compare heart attack rates and treatment patterns between women and men in the United States. The results show that women are receiving less aggressive treatments after a heart attack than men. This pattern emerges even as a greater percentage of women than men die or become disabled due to heart attacks.<sup>1</sup>

BCBS data reveals that heart attacks occur more frequently in men than women, a finding that is consistent with statistics reported by the Centers for Disease Control and Prevention. However, the American Heart Association reports that while heart disease and heart attacks are more prevalent in men, women who experience heart attacks have worse outcomes — they are more likely than men to die within one year of a heart attack, to have another heart attack within six years, and to be disabled because of heart failure within six years. In fact, heart disease far surpasses breast cancer and other recognized causes of death among U.S. women.<sup>2</sup>



Heart attacks place a significant physical and economic toll on Americans. They are the deadliest type of heart condition, accounting for nearly 40 percent of coronary heart disease-related deaths each year. Nearly 1.2 million heart attacks occur annually, 700,000 of which are for the first time. The calculated economic burden of heart disease is \$133 billion in the United States.<sup>3</sup> Heart attacks rank among the five most expensive conditions seen during inpatient hospitalizations in the U.S., accounting for total costs of over \$11.5 billion and 612,000 hospital stays.<sup>4</sup>

1 Report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee

2 National Vital Statistics Report (NVSr) "Deaths: Final Data for 2013"

3 Primary and Secondary Prevention of Coronary Artery Disease – April 2015.

4 Torio CM, Andrews RM. National Inpatient Hospital Costs: The Most Expensive Conditions by Payer, 2011. HCUP Statistical Brief #160. Agency for Healthcare Research and Quality, Rockville, MD. August 2013

This report intends to raise awareness of women’s heart health by analyzing BCBS data to show the following:

ANALYSIS	FINDING
<b>Care Received Post Heart Attack</b>	Women receive less aggressive treatment after a heart attack than men, particularly for angioplasties, angiography and coronary bypass surgery.
<b>Geographic Variation of Heart Attack Rates</b>	Heart attack rates vary across the nation. East, Midwest and Southeast regions generally have higher heart attack rates than the rest of the country. Those regions also tend to have higher levels of physical inactivity, obesity, and smoking — common risk factors for heart attack.

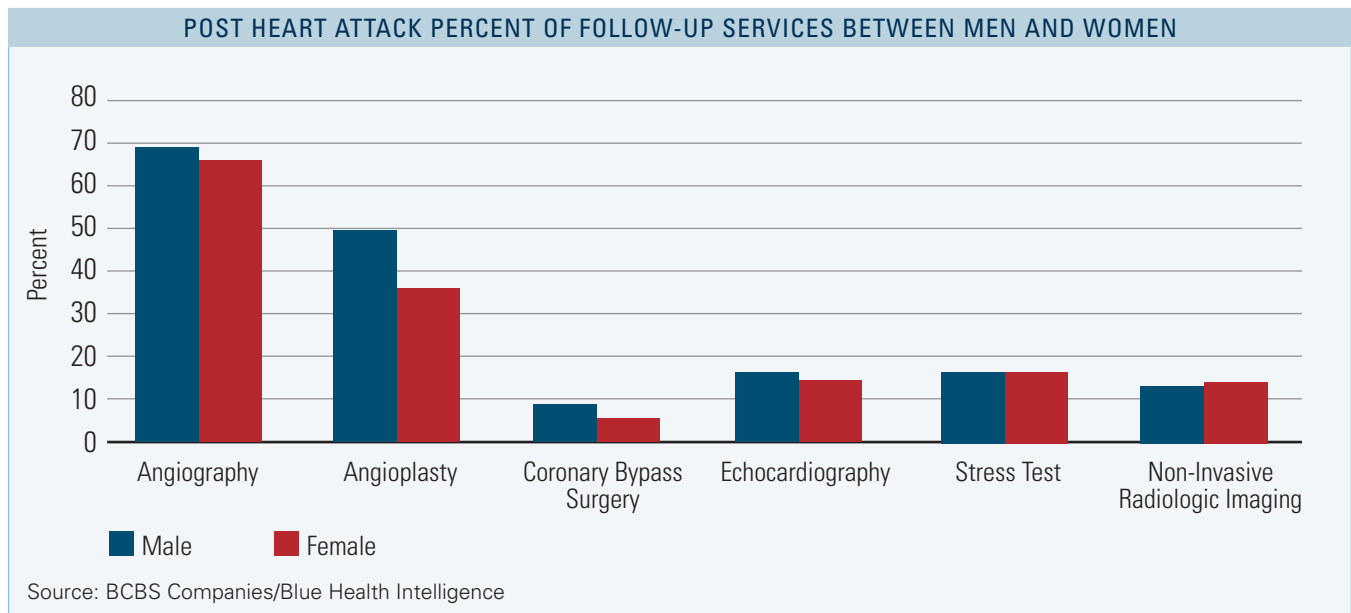
This analysis is based on 2014 claims data from independent BCBS companies’, focusing on people ages 18 through 64.<sup>5</sup> The data set contains more than 43 million BCBS commercially insured members (excludes Medicare and Medicaid).

This is the third edition of “Blue Cross Blue Shield, The Health of America Report,” a collaboration between the Blue Cross Blue Shield Association and Blue Health Intelligence, which uses a market-leading claims database to uncover key trends and insights into healthcare affordability and access to care.

<sup>5</sup> This report examines 12 months of commercial medical claims incurred during 2014, including FEP, group, and individual coverage. The population for the study included 43,535,187 members, ages 18-64, defined as patients per 1,000 members. Mortality is defined as deaths per 1,000.

## CARE RECEIVED POST HEART ATTACK

The BCBS data reveal that in 2014, in the first 60 days following a heart attack, women were less likely than men to receive intensive treatments. Studies have suggested significant differences between men and women when it comes to risks<sup>6</sup> and rates of procedures following a heart attack.<sup>7</sup> BCBS data show that following a heart attack, women are 27 percent less likely than men to receive angioplasties to open clogged arteries. The same data shows that women are 38 percent less likely than men to undergo coronary bypass surgery and nearly 5 percent less likely to receive coronary angiography, a diagnostic procedure that involves an x-ray examination of blood vessels. These findings are consistent with studies that found fewer coronary interventions among younger women.<sup>8</sup>



## GEOGRAPHIC VARIATION IN HEART ATTACK RATES

The BCBS data shows that in the U.S. in 2014, 0.73 out of every 1,000 women experienced a heart attack compared with 1.95 per 1,000 men; but those rates vary considerably across the country. Heart attack rates for both women and men are generally higher in the East, Midwest and Southeast regions of the country (e.g., Delaware, Maryland, Pennsylvania, Tennessee, Indiana, Louisiana, West Virginia, Kentucky and Ohio) and are generally lower in the West and Northwest regions (e.g., California, Colorado, Montana, Oregon and South Dakota). With few exceptions, geographic differences are similar for women and men. However, there are five states — Oklahoma, Louisiana, Maryland, Florida and Mississippi — that rank among the top 25 percent for heart attack rates among women but not for men. (A table reporting heart attack rates for women and men for all states can be found in the appendix.)

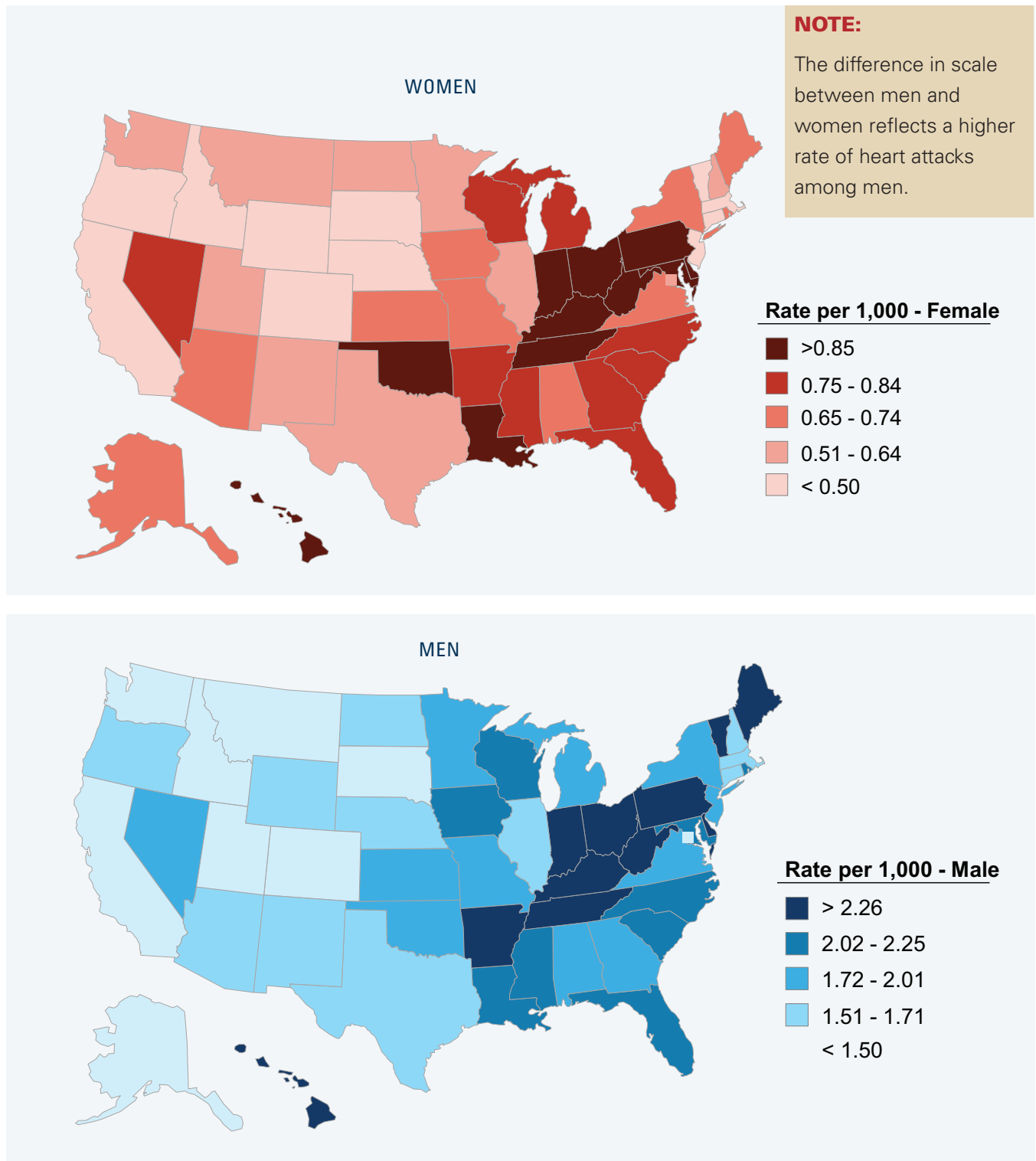
6 King KM, Ghali WA, Faris PD, et al. Sex differences in outcomes after cardiac catheterization: effect modification by treatment strategy and time. *JAMA*. 2004;291(10):1220-1225.

7, 8 Vaccarino V, Horwitz RJ, Meehan TP, et al. Sex differences in mortality after myocardial infarction: evidence for a sex-age interaction. *Arch Intern Med*. 1998;158(18):2054-2062.

Vaccarino V, Parsons L, Every NR, et al. Sex-based differences in early mortality after myocardial infarction. National Registry of Myocardial Infarction 2 Participants. *N Engl J Med*. 1999;341(4):217-225.

8 Dreyer RP, Wang Y, Strait KM, et al. Gender differences in the trajectory of recovery in health status among young patients with acute myocardial infarction: results from the variation in recovery: role of gender on outcomes of young AMI patients (VIRGO) study. *Circulation*. 2015;131(22):1971-1980.

HEART ATTACK GEOGRAPHIC RATE COMPARISON FOR WOMEN AND MEN (AGES 18-64)<sup>9</sup>



Source: BCBS Companies/Blue Health Intelligence

<sup>9</sup> A comparison of lowest and highest rate states for men and women can be found in the Appendix.

Studies show that even modest changes to diet and lifestyle can improve heart health and lower the risk of heart attack by as much as 80 percent.<sup>10</sup> A comparison of three preventable risk factors in states with low versus high heart attack rates, for both men and women, shows that those states with high heart attack rates also tend to exceed the national average rates for at least two of the following three risk factors: physical inactivity, obesity and smoking.

STATE/TERRITORY	% PHYSICAL INACTIVITY	% OBESE	% SMOKE
<b>National Average</b>	<b>30.1%</b>	<b>29.1%</b>	<b>19.2%</b>
<b>States with Low Rates of Heart Attacks for Men and Women*</b>			
South Dakota	23.8	29.9	19.6
Oregon	18.5	26.5	17.3
Nebraska	25.3	29.6	18.5
California	21.4	24.1	12.5
Massachusetts	23.5	23.6	16.6
Idaho	23.7	29.6	17.2
Colorado	17.9	21.3	17.7
Montana	22.5	24.6	19.0
<b>States with High Rates of Heart Attacks for Men and Women*</b>			
Indiana	31.0	31.8	21.9
Kentucky	30.2	33.2	26.5
Delaware	27.8	31.1	19.6
Ohio	28.5	30.4	23.4
Pennsylvania	26.3	30.0	21.0
Tennessee	37.2	33.7	24.3
West Virginia	31.4	35.1	27.3

Source: Behavioral Risk Factor Surveillance System, United States, 2013

\* Low-rate states have rates in the bottom 25 percent of all states; high-rate states are in the top 25 percent of all states — only those states that overlap for both men and women in each category are listed in the table.

10 American Heart Association; <https://www.goredforwomen.org/home/know-your-risk/factors-that-increase-your-risk/>

While important progress has been achieved in bringing attention to the impact of heart disease on women, the findings in this report reflect the actual healthcare experience of thousands of women and reveal the need to further inform and empower women to take control and understand the risks and symptoms of heart disease.

## AWARENESS, SYMPTOMS AND PREVENTION MEASURES

Although chest pain is the most common presentation of acute coronary syndromes (heart attack and unstable angina), women appear more likely to experience acute coronary syndromes without chest pain than men.<sup>11</sup> Women diagnosed with coronary heart disease also have more nonspecific symptoms than men.<sup>12</sup>

Organizations committed to improving women's heart health have been instrumental in bringing attention to this issue. In recognition of the variation of heart attack rates and the power of community-based interventions to help make modest lifestyle changes, the Women's Heart Alliance advocates for improvement in the cardiovascular health of women in high-risk geographies by encouraging women to talk to their healthcare providers. They also are encouraging the medical community to proactively address the screenings, to evaluate diagnostic and therapeutic differences, and to talk to patients and peers about women's heart health.<sup>13</sup>

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11 Khan NA, Daskalopoulou SS, Karp I, et al. Sex differences in acute coronary syndrome symptom presentation in young patients. *JAMA Intern Med.* 2013;173(20):1863-1871.

12 Mosca L, Benjamin EJ, Berra K, et al. Effectiveness-based guidelines for the prevention of cardiovascular disease in women—2011 update: A guideline from the American Heart Association. *Circulation.* 2011;123(11):1243-1262.

13 In October 2014, the Women's Heart Alliance launched Fight the Ladykiller™, a national campaign to build awareness of women's heart health.

## CONCLUSION

The significance of differences between women and men in healthcare will become clearer over the next decade as data improves our capacity to customize treatment interventions. But first we have to ensure that we have more reporting and analysis of differences between men and women in our health research.<sup>14</sup> We can make groundbreaking advances in heart disease if we invest in health research that as a matter of practice analyzes and reports the differences between women and men.

Differences between men and women can also be found in symptoms and prevention, as well as in the types of treatment delivered. Efforts to improve understanding of heart disease and stroke in women and to increase the development of therapies for finding and addressing cardiovascular disease and its risk factors in women will spark a new impetus for understanding differences between women and men in heart disease.

The findings from this report highlight the need for additional examination of treatment patterns and social determinants of heart health at the local and national level among men and women and suggest several areas for follow-up:

- Additional research by local health systems on differences in treatment patterns between men and women.
- Additional research by state health departments and local health systems on the differences in geographic variability and social determinants of health patterns between men and women.

Collectively, interested stakeholders and collaborators can raise awareness in an effective manner that leads to better health outcomes. As advocates increase and intensify their efforts to increase funding for women's heart research and to ensure women's full representation in biomedical studies, researchers and practitioners will better understand the underlying causes of differences between women and men. The result will be a healthier generation of American women.

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<sup>14</sup> Spatz ES, Curry LA, Masoudi FA, et al. The VIRGO classification system: a taxonomy for young women with acute myocardial infarction. *Circulation*. Sep 2015.



## APPENDIX

**Table A1:** States with low and high rates of heart attacks per thousand for women and men in 2014 (ages 18-64).

■ = High rate states

■ = Low rate states

STATE	FEMALE	MALE	STATE	FEMALE	MALE
Ohio	1.25	2.85	Iowa	0.68	2.11
Kentucky	1.18	2.42	Arizona	0.68	1.61
West Virginia	1.14	2.74	Alaska	0.68	1.43
Louisiana	0.97	2.07	Maine	0.65	2.40
Indiana	0.94	2.55	District of Columbia	0.65	0.90
Tennessee	0.93	2.29	Illinois	0.64	1.85
Pennsylvania	0.91	2.48	New Mexico	0.63	1.72
Maryland	0.88	2.04	Texas	0.63	1.62
Delaware	0.86	2.28	New Hampshire	0.60	1.68
Oklahoma	0.85	1.82	Utah	0.56	1.42
Florida	0.84	2.11	North Dakota	0.56	1.67
Mississippi	0.84	2.07	Minnesota	0.52	1.75
Nevada	0.84	1.99	Washington	0.52	1.41
Arkansas	0.83	2.64	Montana	0.52	1.19
Michigan	0.80	1.84	New Jersey	0.51	1.78
South Carolina	0.79	2.05	Connecticut	0.50	1.62
Georgia	0.78	1.72	Nebraska	0.49	1.59
Hawaii	0.78	2.42	Vermont	0.49	2.90
North Carolina	0.78	2.16	Oregon	0.49	1.57
Wisconsin	0.75	2.11	Massachusetts	0.48	1.57
New York	0.72	2.01	California	0.48	1.26
Rhode Island	0.72	2.06	South Dakota	0.45	1.41
Missouri	0.71	2.18	Wyoming	0.45	1.63
Alabama	0.70	2.01	Colorado	0.43	1.50
Virginia	0.70	2.02	Idaho	0.43	1.47
Kansas	0.69	1.87	<b>National Average</b>	<b>0.73</b>	<b>1.95</b>

Source: BCBS Companies/Blue Health Intelligence

Note: Rates of heart attacks per 1,000