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Burden of Cardiovascular Disease in the U.S. - A Focus on Gender and Ethnic Disparities

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The Burden of Cardiovascular Disease in the US: a Focus on Gender and Ethnic Disparities

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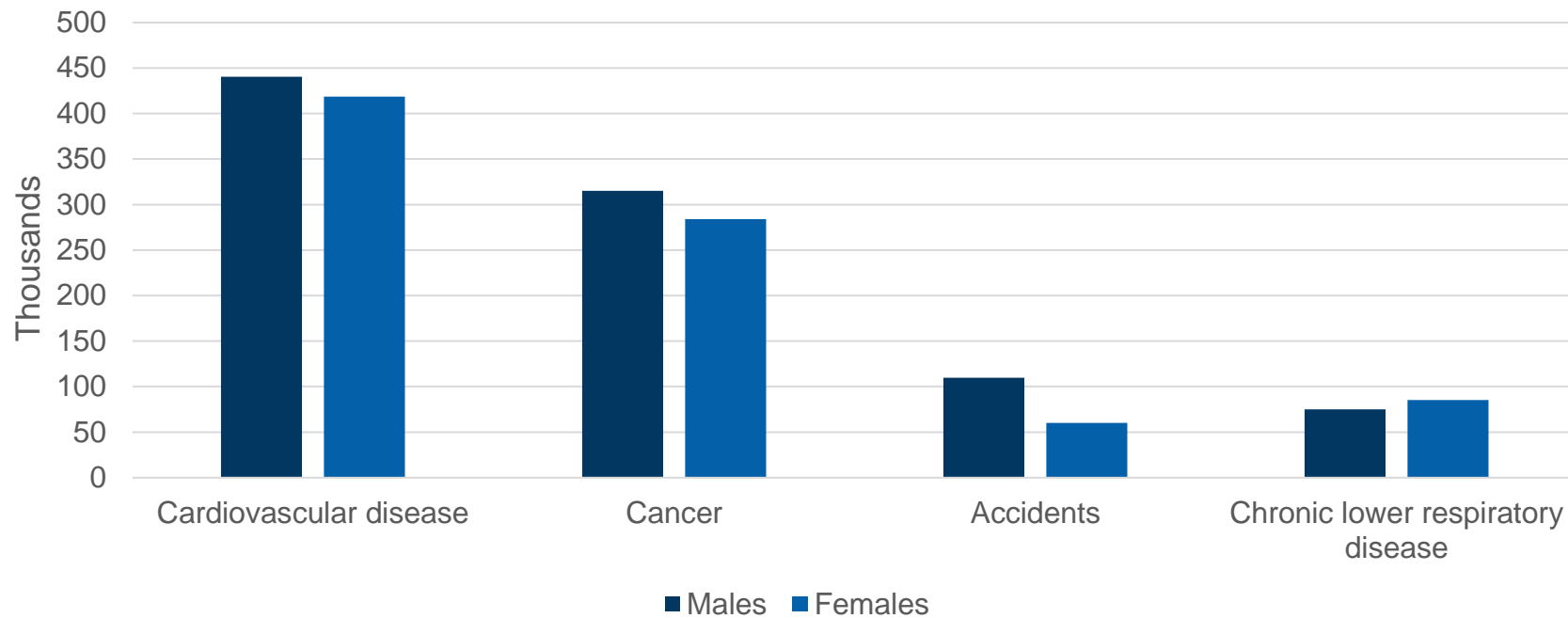
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What is cardiovascular disease (CVD)?



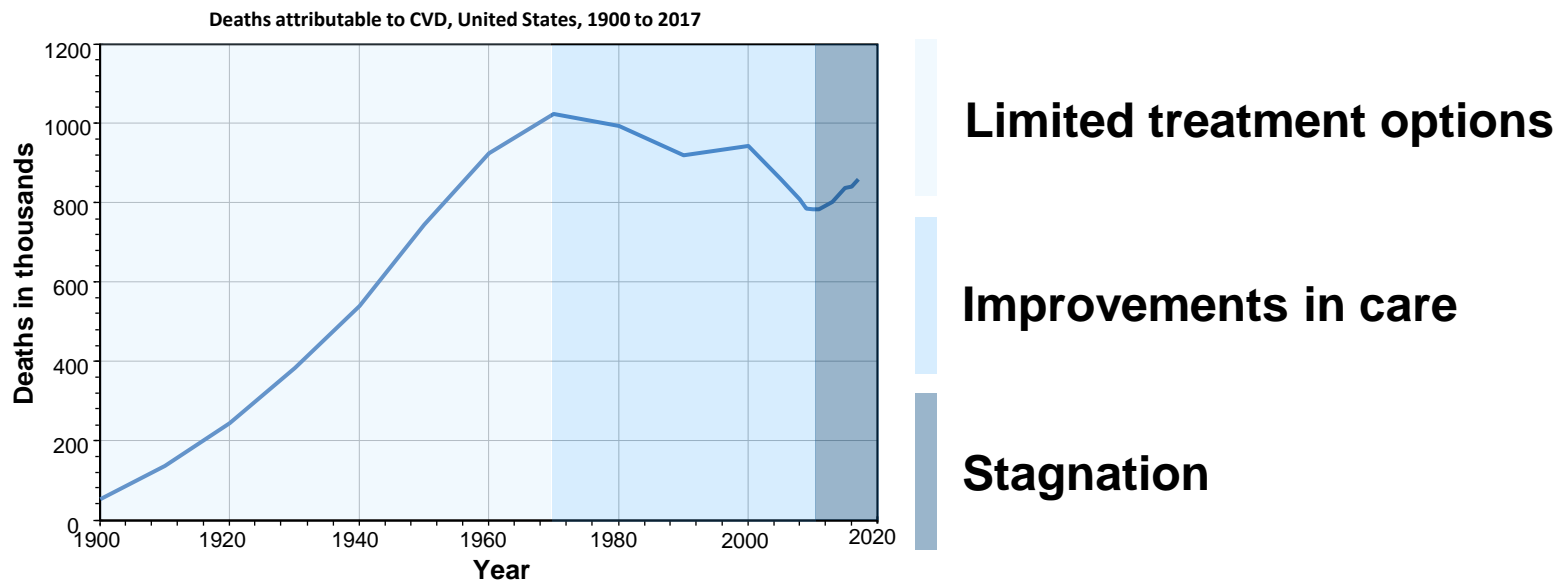
- Broad spectrum of diseases involving the heart and blood vessels:
 - Atherosclerosis
 - Coronary heart disease
 - Hypertension
 - Stroke
 - Heart failure
 - Arrhythmia
 - Valvular heart disease

Cardiovascular disease is the leading cause of death in the US*



4 *Causes of death for all US males and females, 2017. Virani S et al. *Circulation*. 2020;141:e139-e596.

Cardiovascular disease death trend has reversed in recent years



Adapted with permission from Virani S et al.

Cardiovascular disease is impactful, but preventable

Approximately 12 million women in the US live with some form of CVD¹

CVD is the leading cause of death for women in the US²

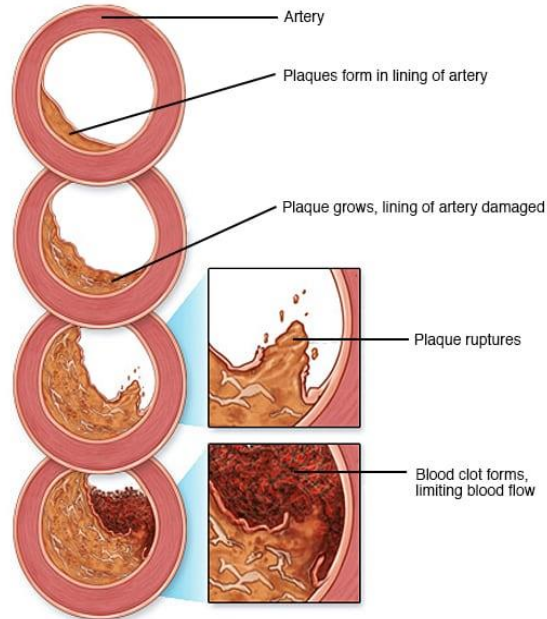
CVD causes 1 in 3 female deaths annually (about one woman every minute)³

A substantial proportion of cardiovascular disease can be avoided by addressing key risk factors – cholesterol, high blood pressure, and smoking

CVD, cardiovascular disease

1. Virani S et al. *Circulation*. 2020;141:e139-e596. 2. CDC. Women and Heart Disease. <https://www.cdc.gov/heartdisease/women.htm> Accessed September 22, 2021. 3. American Heart Association. The facts about Women and Heart Disease. <https://www.goredforwomen.org/en/about-heart-disease-in-women/facts> Accessed September 17, 2021.

Atherosclerotic Cardiovascular Disease (ASCVD) is the most common form of CVD in the US



Adapted from Mayo Clinic²

- ASCVD:
 - Coronary artery disease
 - Angina, heart attack, revascularization
 - Stroke and Transient Ischemic Attack (TIA ‘mini-stroke’)
 - Peripheral arterial disease
- Impact:
 - Approximately 30 million patients carry an ASCVD diagnosis

ASCVD, atherosclerotic cardiovascular disease; CVD, cardiovascular disease.

1. SM Grundy et al. *J Am Coll Cardiol*. 2019;73(24):3168-3209.
2. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/arteriosclerosis-atherosclerosis/symptoms-causes/syc-20350569>. Accessed September 22, 2021

ASCVD is more financially impactful to patients than cancer



- Financial toxicity occurs more frequently in patients with ASCVD than those with cancer
- Financial toxicity includes:
 - Difficulty paying medical bills
 - Inability to pay bills at all
 - High financial distress
 - Medication nonadherence
 - Food insecurity
 - Delayed/foregone care due to cost
- Patients with both ASCVD and cancer experience compounded impact

Gender disparities in preventive care for women

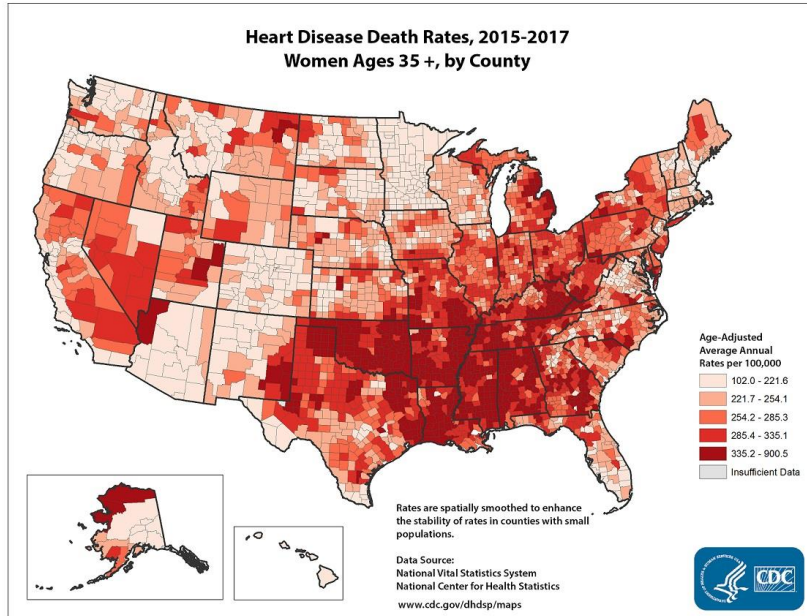
Women are less likely to receive adequate treatment/prevention than men

Physicians underestimate risk in women compared with men

Guideline-recommended risk calculators may underestimate cardiovascular disease risk in women

There are differences in symptoms/presentation between men and women

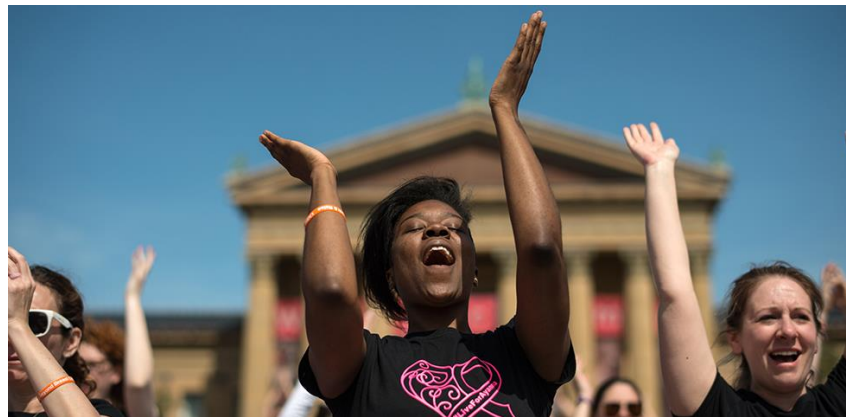
Cardiovascular disease mortality in women



- Leading cause of death for Black and White women
- Approximately 300,000 deaths in 2017
- Approximately 6.2% of women over 20 have coronary artery disease (1 in 16)

Racial and ethnic disparities in cardiovascular disease

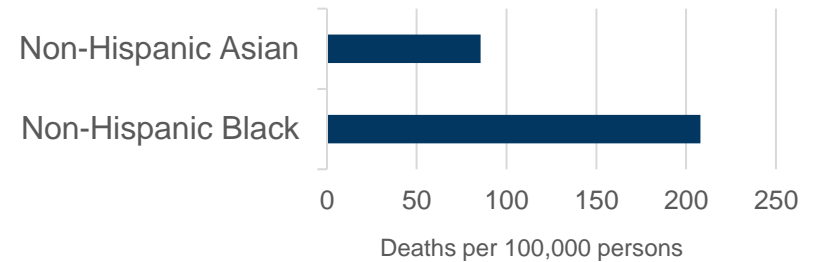
- Underrepresented groups face a higher burden
- Prevalence is higher in Blacks compared to Whites
- Emerging data show lower prevalence and mortality in Hispanic and Latina populations (Hispanic paradox)
- Lower prevalence in Asians compared to Whites



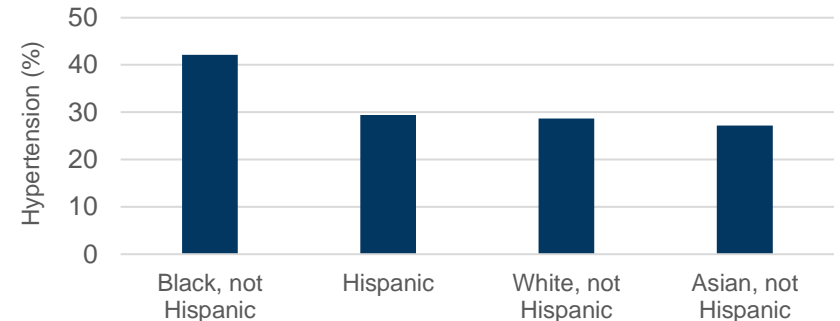
Racial and ethnic disparities in cardiovascular disease

- Non-Hispanic Black people are twice as likely to die from cardiovascular disease than non-Hispanic Asians
- There are substantial differences in the prevalence of risk factors across race and ethnicity

Age-adjusted death rates for heart disease by race & Hispanic origin: 1999-2017



Rate of hypertension by race: 2015-2016



Geographic disparities in cardiovascular disease

Death rate per 100,000 population for cardiovascular disease by state, 2015 to 2017¹

Highest		Lowest	
State	Death Rate	State	Death Rate
Mississippi	308.6	Minnesota	165.0
Alabama	295.3	Colorado	175.7
Oklahoma	294.6	Massachusetts	177.5

Mortality due to heart disease is increasing among women <65 years in rural areas, but not among men in rural areas and not in women in metro areas²

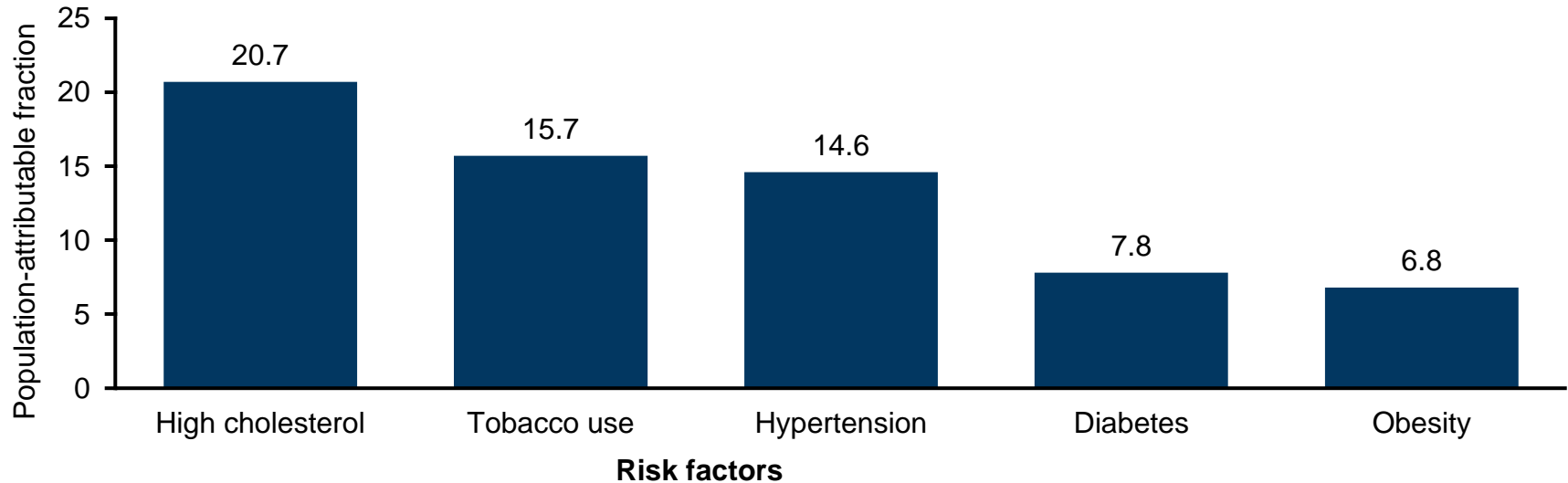
Between 1999 and 2017, rural areas exhibited greater cardiovascular disease mortality, with the absolute difference between rural areas and large metropolitan areas nearly doubling over time.³

CVD, cardiovascular disease.

1. Virani S et al. *Circulation*. 2020;141:e139-e596.
2. Bossard M, et al. *J Am Heart Assoc*. 2020;5;9(9):e015334.
3. Cross SH et al. *JAMA*. 2020;323(18):1852-1854.

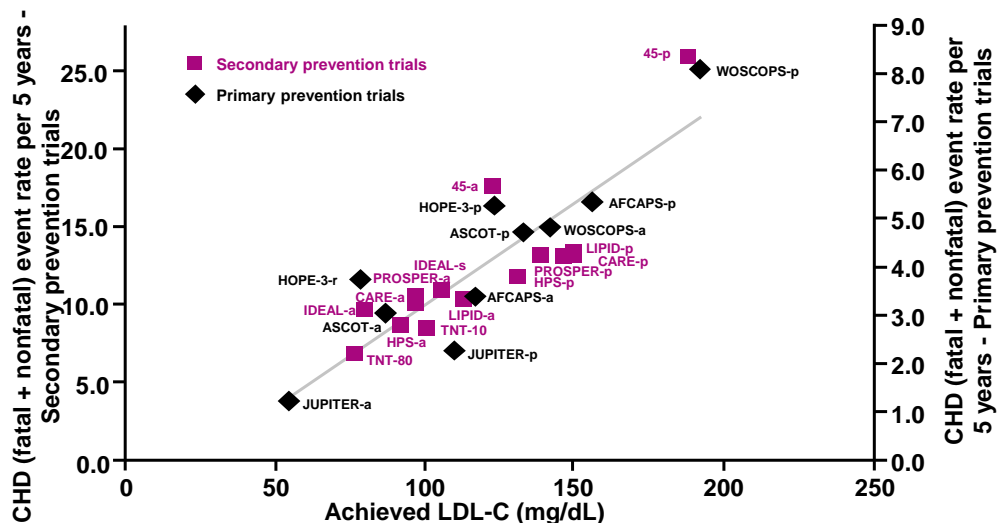
Addressing cardiovascular disease risk by targeting risk factors

Population attributable risk in high-income countries



High cholesterol is an important risk factor for cardiovascular disease

Linear relationship between LDL cholesterol (LDL-C) and cardiovascular disease



Adapted with permission from Ference BA et al.

Gaps in care – suboptimal LDL cholesterol (LDL-C) management



1 in 5

ASCVD patients achieve guideline-recommended LDL-C thresholds of <70 mg/dL despite being eligible for statin therapy

% LDL-C distribution* among patients with ASCVD within certain ACC/AHA statin-eligible groups†



Adapted with permission from Wong ND et al.

Only 20% of patients with ASCVD reach recommended LDL-C goals

ACC, American College of Cardiology; AHA, American Heart Association; ASCVD, atherosclerotic cardiovascular disease; LDL-C, low-density lipoprotein cholesterol. *Total estimated N = Weighted N X (total weighted N on statins in each group/weighted N on statins with LDL-C values); total weighted N on statins for each group (in millions); †Results from US National Health and Nutrition Examination Survey 2011-2012 examining statin use and goal attainment in 1677 patients eligible for statin therapy. Of these patients, 43.2% were on statin therapy.

Wong ND et al. *J Clin Lipidol.* 2016;10,1109-1118.

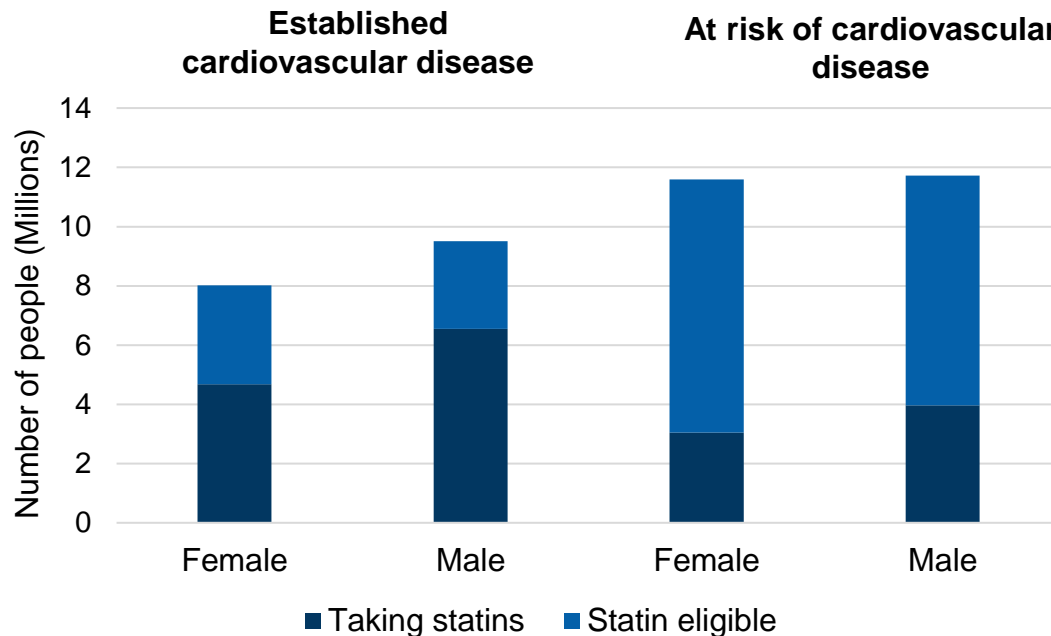
Why do the majority of people have elevated cholesterol?



Physicians

Guideline implementation is suboptimal

Prevalence and Number of US Adults Eligible for and Currently Using Statin Therapy by Sex (NHANES 2011-2014)



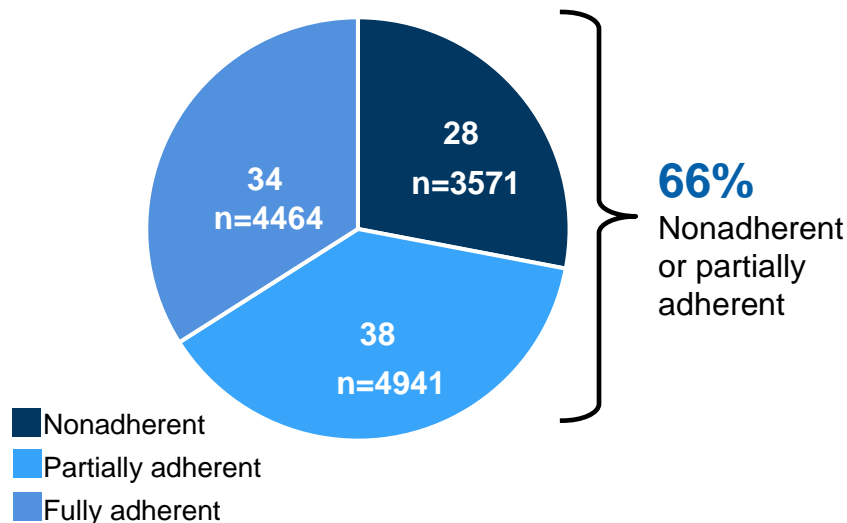
NHANES, National Health and Nutrition Examination Survey

American Heart Association. Center for Health Metrics and Evaluation (CHME). Data Visualizations. <https://aha2017chme.wpengine.com/prevalence-and-number-of-us-adults-eligible-for-and-currently-using-statin-therapy-by-sex-nhanes-2011-2014/>. Accessed November 11, 2020.

Patients

Percentage of ASCVD patients, according to statin adherence levels*

PDC levels	Stratification	Adherence
High	Fully adherent	≥80%
Medium	Partially adherent	≥40% to ≤79%
Low	Nonadherent	≤40%



Adherence to therapy is essential

ACEi, angiotensin-converting enzyme inhibitors; ASCVD, atherosclerotic cardiovascular disease; MI, myocardial infarction; PDC, proportions of days covered.

*A large nonconcurrent cohort study was conducted by using 2010 to 2013 medical and pharmaceutical claims obtained from Aetna Commercial and Medicare Advantage population databases (N=14,119 including 4015 post-MI patients and 12,976 patients with ASCVD).

Patients were stratified based on adherence using PDCs for statins and ACEi.

Improving cardiovascular disease risk in women and underrepresented groups

Generate the right evidence

Recognize that one size does not fit all

Ensure adequate representation of women and underrepresented groups in clinical research

Address barriers to care

Educate health care providers, patients and policymakers

Leverage technology to increase quality of care

Legislative call to action

Encourage your state's health department to update cardiovascular plans to improve your constituents' cardiovascular health

Engage in partnerships to educate stakeholders on prevention

Develop policies that advance a health care system that equally supports diagnostics and treatments



Thank you