

Cardiovascular Disease and Diabetes in Women

2018

Key Messages:

- ◇ Cardiovascular disease and diabetes are responsible for over a third of all female deaths in low- and middle-income countries, nearly three times the number of deaths caused by all infectious diseases and maternal conditions combined.
- ◇ Cost-effective policy and health sector interventions are feasible to scale up in low-resource settings. Countries urgently need to invest in improving capacity to prevent, diagnose, and treat CVD and diabetes at the community and health center levels.
- ◇ Health services for cardiovascular risks and diseases are often not publicly financed in LMICs, leaving households to face catastrophic medical spending.
- ◇ Scaling up all CVD and diabetes interventions in *DCP3* to cover 80% of women in need of those services would cost an additional US\$ 3.6 billion in low-income countries and US\$ 16 billion per year in lower-middle-income countries.

Cardiovascular disease (CVD) is the leading cause of death in women worldwide and contributed over 33% of all female deaths in 2016. Because CVD, diabetes, and related disorders have been perceived as high-income country diseases, there has been a lack of attention on these conditions in low- and middle-income countries, despite the high burden they impose on women and their communities. The chronic nature of these conditions also produces substantial challenges for health systems.



The Burden on Women in Low- and Middle-Income Countries

Cardiovascular disease and diabetes are responsible for three times as many female deaths in low- and middle-income countries (LMICs) as all infectious diseases and maternal conditions combined.

The burden of cardiovascular disease and diabetes in women varies according to age and geographic region. The highest burden is concentrated in women over the age of 50, and those living in middle income countries. Cardiovascular conditions were responsible for over 8.8 million deaths among women in 2016, **81% of whom were living in LMICs.** Women in low-income countries also die at a younger age from heart disease compared to women in high-income countries: 21% of them below age 60 years.

This disparity is likely to continue due to rising exposures to risk factors such as smoking, obesity, and substance abuse in women living in LMICs.

The cost-effectiveness of interventions related to prevention and treatment is established, and significant work must be done to improve delivery of affordable, consistent, and quality care for these conditions in low-resource settings. Further, evidence points to worse outcomes and higher case fatality rates for women as compared to men when seeking acute treatment for cardiovascular conditions.

*A woman living with heart disease in a low income country is **twice as likely to die before age 70** than if she lived in a high income country*

Heart Health Across Women's Lives

Exposure to environmental and dietary CVD risks can begin as early as in utero, and continues through childhood and young adulthood. Because much of CVD and diabetes risk is influenced by socioeconomic and environmental determinants, as well as lifestyle and behavior choices, a woman's cardiovascular health must be examined in the context of her entire life course.

Four conditions contribute to the overwhelming share of disease burden of cardiovascular conditions. Of all cardiovascular conditions, **ischemic heart disease (IHD)** is the largest contributor of mortality and morbidity worldwide. In 2016, nearly 3.6 million deaths of women in low- and middle-income countries were caused by IHD, and of these, over 1.1 million (30%) deaths occurred before age 70 years.

Nearly 2.5 million women die due to **stroke** annually in LMICs. While some studies suggest that stroke incidence and prevalence is higher among men in LMICs, women who experience a stroke have worse outcomes and higher case-fatality rates. **Hypertensive heart disorders** are responsible for nearly 420,000 female deaths each year in LMICs. Over 80% of these deaths occur in women over the age of 60.

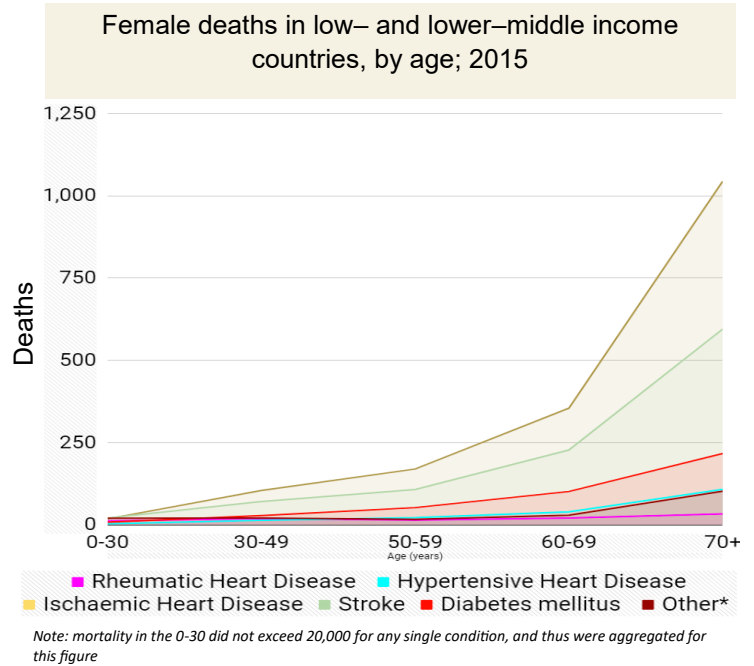
Rheumatic heart disease (RHD) is the most common cause of acquired heart disease among children and young adults in LMICs. In 2016, 160,000 women in LMICs died from RHD. Unlike other CVDs, RHD starts in childhood or early adulthood and shares risk factors with infectious diseases. Approximately 1 out of every 125 women of childbearing age in LMICs is affected, and the condition is usually undiagnosed and untreated. Chronic disability from symptomatic RHD keeps girls out of school and women out of work, and it results in high rates of maternal death and stillbirth.

Diabetes Mellitus

An estimated **6.2% of the global female population had diabetes** in 2017, and approximately **78% of those women (180 million) are living in LMICs**. Prevalence varies greatly by geography, and is still higher overall in high-income countries. However, diabetes prevalence increased markedly in LMICs in the last few decades, likely due to increased exposure to risk factors such as overweight and obesity. In addition to shortening the lifespan by an average of 7-15 years, diabetes is associated with high levels of morbidity and disability. Pregnancy also brings risk of developing gestational diabetes.

Risk Factors

Deaths among women due to unhealthy diet have increased 60% in low income countries since 1990 and dietary risk



factors are responsible for an increasing share of female mortality. Age-adjusted mortality rates attributed to both low physical activity and unhealthy diet also reveal no progress over the past three decades in reducing risk of preventable deaths among either women or men over this time period.

Data from the Global Burden of Disease study indicates that globally rates of smoking exposure among women have declined 13% since 1990. Nonetheless, death rates for men in LICs and lower-middle-income countries due to tobacco are still 3x that of women. Alcohol use among women shows similar declines globally (while rising among men) over the same time period.

Additionally, changing social norms and behavioral factors have led to increased risk exposures for women. For example, in nearly half of the 151 countries surveyed by the World Health Organization in 2015, smoking rates for adolescent girls now rival that of adolescent boys and are increasing much faster. About 70% of smokers who begin in adolescence continue into adulthood. In another example, social influences in many cultures restrict women's movement and physical activity in different ways, contributing to increased CVD risks.

Women's Needs Across the Continuum of Care

Many of the barriers to prevention and treatment of cardiovascular diseases are not unique to women, and plague health systems across LMICs broadly. These barriers affect all those at risk of CVD in LMICs, but higher acute CVD event case fatality and worse outcomes for women compared to men suggest additional challenges.

Symptom Expression

Screening and prevention of CVD requires awareness and knowledge of differences in symptom expression in women, compared to men. Evidence (primarily from HICs) suggests that women are substantially less likely than men to complain of acute chest pain during a myocardial infarction, and are more likely to present with general pain in the back, neck, and chest, shortness of breath, a rapid heart rate, and nausea. These gender differences in acute CVD symptom pattern are larger among younger individuals and decrease with age. Failure to recognize differences in symptom expression leads to missed and delayed diagnoses, and worse health outcomes for women. Gender-responsive diagnostic methods must be developed and incorporated into health worker education and training.

Access & Quality of Care

LMICs face significant challenges in providing women with access to quality, consistent, and long-term care and disease management, which CVD conditions and diabetes often require. For example, insulin for diabetes and diuretics for hypertension are among the most effective interventions to address CVD and diabetes, and treatment with either require sustained interaction with the health system and availability of affordable medications and supplies.

Financial Risk Protection & Impoverishment

A study done in 2011 showed that more than half of the persons hospitalized for stroke, myocardial infarction, or peripheral artery disease in China, India, and Tanzania experienced catastrophic health spending in the process of receiving care. While the study did not disaggregate effects by sex, there are reasons to predict that women may bear more financial risk from these conditions. Women often have less control over household finances, leading to dependence on a spouse or other family member to cover costs associated with diagnosis, treatment, and care. Also, women's health needs may be deprioritized in favor of spending household income on children or other necessities. As caregivers, women will often give up income or education when other members of the family suffer from chronic disease, such as CVD and diabetes. On average, women devote 2 to 10 times the hours per day than men do to caregiving and are less likely to have access to sources of stable employment and credit should they themselves require care for a chronic disease.

A Policy Response

Disease Control Priorities, 3rd edition includes both health services and intersectoral actions among its review of evidence-based approaches. In addition to identifying high-priority health services for CVD, *DCP3* recommends seven fiscal, regulatory, or built environment changes. These policy interventions (see box) require action from multiple government agencies.

Some of the strongest policy recommendations from *DCP3* aim at reducing consumption of tobacco and alcohol through increased taxes and regulations on advertising and sales. Taxes on unhealthy substances, such as tobacco, alcohol, and sugary beverages, are an effective and highly cost-effective approach to reducing CVD risks. Tobacco use has declined dramatically in high-income countries due to taxation, along with tobacco-related mortality. But LMICs have far to go in raising taxes on these risk factors and this should be prioritized in the face of growing exposures among female adolescents in many countries.

Ministry	Policy
<i>Finance</i>	<ul style="list-style-type: none">• Impose large excise taxes on tobacco, alcohol, and other addictive substances• Tax sugar sweetened beverages to discourage use
<i>Health</i>	<ul style="list-style-type: none">• Impose and enforce strict regulation of advertising, promotion, packaging and availability of tobacco and alcohol• Ban trans fats and replace with polyunsaturated fats• Impose regulations to reduce salt in manufactured food products
<i>Education</i>	<ul style="list-style-type: none">• Ensure that subsidized foods and school lunches have adequate nutritional quality
<i>Transportation</i>	<ul style="list-style-type: none">• Take steps to develop sustainable infrastructure enabling pedestrians and bicyclists

A Health Sector Response

Beyond implementing effective population policies to reduce CVD risks, a basic set of screening, acute, and chronic health care services is needed across the continuum of care. The technical and policy experts behind *DCP3* have identified a minimum set of interventions that should be available to manage CVD and diabetes and prevent further complications. Several interventions target women in pregnancy, highlighting the opportunity to take advantage of existing reproductive health services to initiate care for chronic conditions like diabetes that may begin in pregnancy but can continue beyond childbirth.

Population level

- ◇ Mass media messages concerning healthy eating, physical activity, and use of tobacco and alcohol
- ◇ Vector management for Chagas disease

Health Center

- ◇ Tobacco cessation counseling and use of nicotine replacement therapy when feasible

Health Center

- ◇ Single-pill combination therapy for persons with multiple CVD risk factors
- ◇ Medical management of ischemic heart disease, stroke, peripheral vascular disease, and heart failure
- ◇ Provision of aspirin and hospital referral for all cases of suspected acute myocardial infarction
- ◇ Provision of penicillin for rheumatic fever or established rheumatic heart disease
- ◇ Screening and management of diabetes and hypertension among at-risk adults and pregnant women

First-level Hospital

- ◇ Medical management of acute heart failure, stroke, coronary syndrome, and critical limb ischemia

Referral and Specialty Care

- ◇ Use of percutaneous coronary intervention for acute myocardial infarction where resources permit (not recommended for low-income countries)

Improvement is Possible at a Cost

Scaling up the cost-effective interventions identified in *DCP3* to full coverage could avert 163,000 premature deaths among women in low-income countries and over half a million premature deaths among women in lower-middle income countries in 2030 alone. In contrast to communicable diseases, over 75% of lives saved are in women over 50 years of age, and 95% are among women over 30, the peak of women's workforce productivity and caregiving years. These gains are largely achieved by preventing deaths from IHD and stroke. In lower-middle income countries 744,000 and 542,000 women are projected to die from IHD and stroke, respectively, in 2030 – over one-third of these deaths could be prevented through use of the health sector interventions described above. Another 138,000 deaths due to diabetes in women could be averted.

Due in part to the low levels of investment in noncommunicable diseases to date in LMICs, averting CVD and diabetic mortality will come at a substantial incremental cost, but many lives could be saved. In low-income countries, scaling up these interventions to provide 80% coverage as part of Universal Health Coverage would require an additional US\$ 3.6 billion, or US\$ 4 per capita, each year. In lower-middle income countries, the added annual cost would be US\$ 16 billion, or US\$ 6 per capita.

Recommendations for Policymakers

- **Integrate scale-up of effective policy and health sector interventions for CVD and diabetes in women in national health sector planning.** Because few of the above-mentioned interventions are currently available from public health services in LMICs, CVD and diabetes cause one-third of all deaths among women. While these interventions take a significant investment of funds, the potential for avoiding CVD and diabetes treatment costs and gaining workforce productivity is immense.
- **Integrate CVD screening and treatment into antenatal care and ensure linkages with primary health centers for post-pregnancy disease management.** In many LMICs, additional capacity-building for screenings, long-term follow-up, and reliable medication delivery will also be needed at the health center level to ensure adequate quality of care.
- **Establish referral centers for medical management of acute CVD and diabetic conditions.**

For more information and source materials, please visit www.dcp-3.org/gender

