

The state of US women's heart health: A path to improved health and financial outcomes

Closing the cardiovascular-disease gap between men and women could help women regain 1.6 million years of life lost because of poor health and early death, and boost the US economy by \$28 billion annually by 2040.

This article is a collaborative effort by Lucy Pérez and Megan Greenfeld of the McKinsey Health Institute and leaders of the American Heart Association.



Exhibit 1

of CVD, but women are more likely to die after having an acute cardiovascular event.

Estrogen, a sex hormone, is believed to have a protective effect on the heart and may potentially explain some of the differences. Estrogen plays a role in regulating various metabolic functions, such as lipid levels (amounts of fat) in the blood, inflammatory markers (contributing to damage to vessel walls), and the coagulant system (affecting blood clot formation).² Additionally, estrogen is believed to help relax and open up blood vessels throughout the body, allowing for better blood flow.

The understanding of biological differences such as these has expanded, but major knowledge gaps still exist. Heart health

include decreased estrogen exposure and shared risk factors, such as obesity.

There's ample opportunity for research into better understanding the links between menstruation and the overall health of a woman. With greater knowledge and treatment options, women can embark on a lifelong journey to view their heart health more holistically.

Menopause symptoms may play a role in hypertension

Menopause is a natural part of a woman's biological aging characterized by the end of the menstrual cycle and reduced estrogen and progesterone. It typically occurs between the ages of 45 and 55. CVD is more common in postmenopausal women than in similarly aged men, though this isn't the case prior to menopause.⁹ Women between the ages of 45 and 65 (around menopausal transition) have the greatest rise in the prevalence of hypertension, yet more research is needed to understand why.

Up to 80 percent of women may experience common menopausal symptoms, such as hot flashes and night sweats. These vasomotor symptoms (VMS) may play a role in hypertension and increased CVD risk. A study showed that women with frequent VMS associated with menopause had

of both low representation of women and low representation of non-White races and ethnicities in clinical trials, making their representation in clinical

the studies that did report the sex, only males were used in 72 percent of cases, only females were used in 13 percent of cases, and both sexes were used in 16 percent of cases. Many researchers believe that including females may hamper studies because of the need for larger sample sizes, the increased cost, and the higher variability of female data as a result of the estrous cycle.⁹

Sex should be a consideration as part of initial study design, not only as an afterthought when outcomes differ. For example, between 1997 and 2000, the US Food and Drug Administration removed 10 drugs from the market because of safety concerns. For example, between 1997 and 2000, the US Food and Drug Administration removed 10 drugs from the market because of safety concerns.

in testing increased ACS diagnosis in women by 42 percent and 6 percent in men.

When looking at common interventions for heart failure, women may experience greater risk, side effects, and even worse outcomes than men do. This finding could be the result of a variety of factors, from differences in body composition to drug metabolism to hormone level fluctuations.⁴⁸ One study found that standard dosing of common cardiac medications (for example, ACE inhibitors, angiotensin receptor blockers, and beta-blockers) resulted in increased drug effect in women than in men at the same dosage, with a higher frequency of side effects.⁴⁹

Women miss out on sex-appropriate cardiac care because of care delivery gaps

A lack of knowledge, limited availability of sex- and gender-specific medical education, and various implicit and explicit biases contribute to the inequity in CVD care delivery.

The lack of knowledge persists throughout medical training. One study showed that only 22 percent of PCPs and 42 percent of cardiologists felt extremely well prepared to assess CVD risk in women.⁵⁰ Indeed, in one survey of over 40 medical schools in Canada and the United States, 70 percent of respondents didn't formally include sex- or gender-specific content in their curriculum.⁵¹ With many women relying on an ob-gyn as their PCP,

⁴⁷ "Sex, racial, and ethnic disparities in acute coronary syndrome," August 2023.

⁴⁸ J. Tamargo et al., "Gender differences in the effects of cardiovascular drugs," *European Heart Journal—Cardiovascular Pharmacotherapy* July 2017, Volume 3, Number 3.

⁴⁹ Giuseppe M. C. Rosano et al., "Gender differences in the effect of cardiovascular drugs: A position document of the Working Group on Pharmacology and Drug Therapy of the ESC," *European Heart Journal* October 2015, Volume 36, Number 40; Bernadette T. Santema et al., "Identifying optimal doses of heart failure medications in men compared with women: A prospective, observational, cohort study," *Lancet*, October 2019, Volume 394, Number 10,205.

⁵⁰ "Knowledge, attitudes, and beliefs regarding cardiovascular disease in women," July 2017.

⁵¹ Najah Adrea et al., "Integration of women's cardiovascular health content into healthcare provider e

that almost two-thirds of female cardiologists consistently experienced discrimination at work, mostly related to gender and childbirth.⁶⁴ Less than a quarter of men reported discrimination, which was largely in relation to race and religion rather than gender.

A survey of internal medicine trainees found that having a positive role model was the most important professional development need for both men and women.⁶⁵ A significant majority of women felt that the field of cardiology lacked the positive role models they were looking for. This lack of role models, combined with discrimination, may discourage potential candidates from entering the field and perpetuate low rates of women serving as mentors for future trainees.

These biases extend beyond the clinical setting. Women are less likely than men to receive bystander cardiopulmonary resuscitation in case of out-of-hospital cardiac arrest, resulting in lower survival to discharge (the odds ratio for men to women is 1.27⁶⁶).

The use of AI in healthcare has seen a dramatic increase in recent years. Some uses show great promise. In one study, clinical-decision-making accuracy in chest pain evaluation was improved with the assistance of AI, without introducing or exacerbating existing gender biases.⁶⁷ Amid busy schedules, clinicians often don't have the time to stay on top of the latest research and clinical guidelines, so using AI tools as prompts to ask pertinent questions in a consultation (for example, assessing a woman's menopausal history as part of a comprehensive CVD risk assessment) could be a viable solution.

⁶⁴ Marwah Shahid, "Addressing the underrepresentation of women in cardiology through tangible opportunities for mentorship and leadership", *Methodist DeBakey Cardiovascular Journal*, January–March 2019, Volume 15, Number 1.

⁶⁵ Meghan York et al., "Professional preferences and perceptions of cardiology among internal medicine residents: Temporal trends over the past decade," *JAMA Cardiology*, December 2022, Volume 7, Number 12.

⁶⁶ Audrey L. Blewer et al., "Gender disparities among adult recipients of bystander cardiopulmonary resuscitation in the United States," *Circulation Cardiovascular Quality and Outcomes*, August 2018, Volume 11, Number 8.

⁶⁷ Ethan Goh et al., "ChatGPT influence on medical decision-making, bias, and equity: A randomized study of clinicians evaluating clinical vignettes," *medRxiv*, November 2023, Volume 2023.

⁶⁸ Davide Cirillo et al., "Sex and gender differences and biases in artificial intelligence for biomedicine and health care," *Health Affairs*, 2023, 42(11):e26135.8 (5.9 (c)-15.8 (i)-17.4 (a)).

acknowledging the overlap between therapeutic areas and cross-therapeutic area expansion (for example, into cardiovascular, metabolic, renal, and other areas).

In addition to expanding sex-segregated R&D across emerging clinical interventions that benefit both women and men, increased investment is needed for female-specific heart health conditions (for example, preeclampsia). In 2020, only 1 percent of healthcare research and innovation was invested in female-specific conditions beyond oncology.

Venture capital investment in women's health has increased 314 percent over the past five years; however, investment in FemTech (diagnostic tools, products, services, wearables, and software that use technology to address women's health issues) makes up 2 percent of the overall health sector. Women make up 13 percent of start-up founders overall yet were 24 percent of FemTech founders in 2022—a rate that declined to 22 percent in 2023. Since women only receive 2 percent of total venture capital funding in the United States, this puts FemTech at a potentially greater disadvantage.

In parallel, research suggests that cardiovascular-health-related start-ups and innovations receive less funding than other major therapeutic areas do.⁷⁵ And when they do receive funding, it's mostly in digital health or data-driven business models, suggesting that start-ups with a cardiovascular focus outside of these fields may continue to be underfunded.⁷⁶

Female leadership across healthcare research and delivery matters. While women make up the vast majority of the US healthcare workforce, only about a third of US hospitals are led by women, and less than 15 percent of system CEO roles are filled by women.⁷⁷ A study across 4,271 medical products

demonstrated that boards with women participating as directors announced recalls about four weeks earlier than boards with all men did.⁷⁸ With a lower number of women in decision-making positions, there might be a blind spot regarding the potential and importance of women's health innovations, especially in conditions such as CVD that have been primarily associated with men.

As a note, the investment landscape for FemTech is still nascent, with 1.4 (at 1n4a9-6.5m1 (n (s a n4 (y i) 1.0.9 (h)-0

⁷¹ "Unlocking opportunities in women's healthcare," McKinsey, February 14, 2022.

⁷² Phalguni Deswal, "FemTech: The world's largest 'niche' market," Medical Device Network, March 8, 2024.

⁷³ Kevin Dowd, "A sector-by-sector guide to the gender gap among startup founders," Carta, January 17, 2024.

⁷⁴ Sara Silano, "Women founders get 2% of venture capital funding in U.S.," Morningstar, March 6, 2023.

⁷⁵ Christopher Colecchi and David Tancredi, "Broadview Ventures: Investing in the future of cardiovascular technology," Basic to Translational Science, February 2016, Volume 1, Number 1 2.

⁷⁶ "What drives innovation in cardiovascular health?," AHA, accessed June 2024.

⁷⁷ American Hospital Statistics 2017 edition, American Hospital Association, January 2017; Jason N. Mose, "Representation of women in top executive positions in general medical-surgical hospitals in the United States," Women's Health Reports, May 2021, Volume 2, Number 1.

⁷⁸ Corinne Post et al., "Dangerous products recalled faster when women are on the board," JAMA, March 24, 2022.

⁷⁹ PitchBook, accessed February 2024.

women's heart health across all age groups, everyone could benefit.

Advance sex-specific research from basic sciences to clinical trials

Research could be meaningfully improved by shifting from a one-size-fits-all approach to prioritizing sex-specific differences:

- Developing more knowledge around women and heart disease relies on a deeper understanding of biological differences. Future research could provide a crucial recognition of the distinctive vulnerabilities that women face across their lives, including during pregnancy.
- Revamping and expanding clinical research initiatives may include conducting clinical trials specifically focused on women at all stages of life. Validating women-centric diagnostic tools and investigating the impact of CVD on vulnerable and intersectional populations could also improve care delivery.
- Additional transparency and disclosure within research, drugs, and devices could lead to national dashboards on growing evidence on sex-based differences. As the evidence base becomes more robust, it could be built into clinical guidelines.

Improve routine health data collection, diagnostics, and treatment algorithms

Effective guidelines and algorithms rely on a foundation of comprehensive data collection and a balanced representation of women across all age groups and health conditions. Collecting women-specific data in a standardized, easily digestible format should become routine. For example, the NIH has branded menstrual cycle information as the “fourth vital sign.”⁸⁰

Potential avenues to improve routine health data

Other actions may include the following:

- Training on how to identify and mitigate potential biases within the healthcare setting. Hospital systems can further strengthen this approach by creating women's health programs that bring together specialties such as cardiology, obstetrics–gynecology, oncology, and primary care. These specialists could not only serve patients but act as educational hubs for other providers within the hospital setting.
- Expansion of the role that allied healthcare practitioners play in the management of CVD. Many people, such as doulas, midwives, and community workers, can be involved in cardiovascular care in women. For example, tailored, patient-centric, nurse-led interventions focused on self-management strategies have been shown to encourage a sense of ownership over a patient's health journey and increase the likelihood of sustained positive behavior.

Raise public awareness on heart health, and tailor prevention strategies across a lifespan

Public-education campaigns continue to play a

significant role in cardiovascular disease prevention. Public-education campaigns continue to play a

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women's underrepresentation in clinical research; lower effectiveness of CVD prevention, diagnosis in women compared with men; and poorer care delivery for women compared with men. Addressing the gap by 2040 could give an annual 1.6 million years of life lost because of poor health or early death back to women. In parallel, it could boost the US economy by \$28 billion and the global economy by at least \$80 billion.

Closing the woman's health gap in CVD can't be done singlehandedly overnight. It will require a consistent and collective effort from various stakeholders, including community leaders, governments, healthcare institutions, individuals, investors, medical and nursing education boards, and workplaces. As women are often the cornerstones of their families, communities, and

workplaces, addressing their health equity could have far-reaching effects on all strata of society.

This can begin by reframing women's heart health as a problem for everyone to tackle, not as a "women's problem."

Women's heart health can be improved at every stage of life, and the wide gap reflects tremendous opportunity to improve the quality of life for every woman in the United States. In a new era, the burden of CVD could be erased, and women could better lend their talents, energy, and leadership to every sector of society. By prioritizing accessible healthcare, education, and research related to women's heart health, a future is possible where millions of women not only live longer, healthier lives, but also contribute their full potential to a thriving global society.

Technical appendix