

# Heart and Brain Disease in Women

## Resource Sheet

2018

### Overview

This resource sheet was curated by the Global Health Education and Learning Incubator at Harvard University to support an upcoming Forum at Harvard T.H. Chan School of Public Health, “[Heart and Brain Disease in Women: Sex and Gender Connections](#).” The multidisciplinary materials are suitable for educators and learners seeking an introductory snapshot of sex-specific health, particularly from the perspective of the event’s panelists. The event description is as follows:

*The evidence on sex differences in understanding, treating and preventing disease is mounting, and The National Institutes of Health has made Sex as a Biological Variable (SABV) key to all research it funds. Scientists are developing an unprecedented understanding, in particular, of the links between heart and brain disorders in both women and men. These insights are opening new frontiers in investigating the co-occurrence of heart disease and depression, and the risk for memory decline and Alzheimer’s disease — comorbidities that disproportionately impact women. Applying a sex-and-gender lens, this Forum will explore the unfolding story of newly-discovered connections between heart and brain – and their potential to transform understanding of heart disease, Alzheimer’s and depression in women. Presented during American Heart Month and shortly before International Women’s Day, we will ask why diseases of the heart and brain often go hand-in-hand, with women often at twice the risk of men – and how this new understanding can be translated into better treatments and prevention strategies for women across the globe.*

[The Forum at Harvard T.H. Chan School of Public Health](#) is a live webcasting series that provides decisionmakers with a global platform to discuss policy choices and scientific controversies across the world.

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## Annotated Bibliography

### Women and Health: The Key for Sustainable Development

Report. Langer A et al. Women and Health: The Key for Sustainable Development. The Lancet 2015; 386: 1165–1210. DOI: [http://dx.doi.org/10.1016/S0140-6736\(15\)60497-4](http://dx.doi.org/10.1016/S0140-6736(15)60497-4).

GHELI repository link: <http://repository.gheli.harvard.edu/repository/11059>.

This *Lancet* Commission report examines girls' and women's health, emerging transitions, and important unmet needs that remain. Population aging and transformations in the social determinants of health have increased the coexistence of disease burdens related to reproductive health, nutrition, and infections, and the emerging epidemic of chronic and noncommunicable diseases. Simultaneously, worldwide priorities in women's health have themselves been changing from a narrow focus on maternal and child health to the broader framework of sexual and reproductive health and to the encompassing concept of women's health, which is founded on a life-course approach. This expanded vision incorporates health challenges that affect women beyond their reproductive years and those that they share with men, but with manifestations and results that affect women disproportionately owing to biological, gender, and other social determinants.

### Women's Mental Health

Article Series. Women's Mental Health. The Lancet Psychiatry 2016. <http://www.thelancet.com/series/women-mental-health>.

GHELI repository link: <http://repository.gheli.harvard.edu/repository/11151>

This *Lancet Psychiatry* series looks at the current state of gender-specific research in mental health and suggests future directions which might reveal more about the social and biological factors contributing to mental disorders in women, and inform better treatments. Addressing the relative lack of research on these underlying mechanisms, the series papers focus on psychosis, depression, and anxiety; a fourth paper explores the issue of violence against women, its mental health consequences, and violence intervention recommendations for clinical services.

Series papers and articles include:

- [Oestrogens, Prolactin, Hypothalamic-Pituitary-Gonadal Axis, and Schizophrenic Psychoses](#)
- [Why Are Women So Vulnerable to Anxiety, Trauma-Related and Stress-Related Disorders? The Potential Role of Sex Hormones](#)
- [Why is Depression More Common Among Women Than Among Men?](#)
- [Violence Against Women and Mental Health](#)

### Sex-Specific Impact of Maternal-Fetal Risk Factors on Depression and Cardiovascular Risk 40 Years Later

Article. Goldstein JM et al. Sex-Specific Impact of Maternal-Fetal Risk Factors on Depression and Cardiovascular Risk 40 Years Later. *Journal of Developmental Origins of Health and Disease* 2011; 2 (6): 353–364.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3558934>.

This article examines fetal risk, including growth restriction and preeclampsia, as a predictor of major depressive disorder (MDD) and cardiovascular disease (CVD). In this longitudinal study, mothers were followed through pregnancy and their children were recruited as adults 40 years later. After analyses of data from psychiatric diagnosis and stress challenges, results found that fetal risk was associated with low high-frequency R-R interval variability (HF-RRV) response. This was especially apparent in low socioeconomic status (SES) groups. Fetal risk was three times greater in participants with MDD. Overall, these findings suggest that with a higher association in females, fetal risk factors are predictors to the comorbidity of MDD and CVD risk.

## **Disruption of Fetal Hormonal Programming (Prenatal Stress) Implicates Shared Risk for Sex Differences in Depression and Cardiovascular Disease**

Article. Goldstein JM, Handa RJ, Tobet SA. Disruption of Fetal Hormonal Programming (Prenatal Stress) Implicates Shared Risk for Sex Differences in Depression and Cardiovascular Disease. *Frontiers in Neuroendocrinology* 2014; 35(1): 140-58. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3917309>. This article explores the sex-dependency of comorbidity of major depressive disorder (MDD) and cardiovascular disease (CVD). The authors suggest that maternal environments drive sex-dependent changes of the fetal brain, and in turn, changes in fetal programming. This literature review examines these hormone-dependent pathways, such as the hypothalamic-pituitary-adrenal (HPA) axis, that disrupt prenatal stress and result in a greater risk for women than men. One significant alteration includes disruptions in GABA pathways, which can affect neuronal and vascular growth factors. Understanding roles of these pathways in fetal development can aid the creation of novel therapeutics in combatting heart and brain injury.

## **Sex and Gender Specific Health**

Resource Portal. Sex and Gender Specific Health. Laura W. Bush Institute for Women's Health at Texas Tech University Health Sciences Center 2014. <https://www.sexandgenderhealth.org/index.html>. This resource portal from the Laura W. Bush Institute for Women's Health at Texas Tech University Health Sciences Center curates educational learning modules, videos, and slides that specifically explore sex and gender as important health determinants. The free, multidisciplinary resources were designed to integrate sex and gender-based evidence into curricula and educational programs.

## **A Whole-System Approach to Improving Cardiovascular Health in Women**

Blog Post. Robinson BA et al. Whole-System Approach to Improving Cardiovascular Health in Women. *The Lancet United States of Health Blog* 2018; Feb 27. <http://usa.thelancet.com/blog/2018-02-27-point-view-whole-system-approach-improving-cardiovascular-health-women-2>.

This blog post by the Women's Heart Alliance describes holistic approaches to addressing sex-specific differences in cardiovascular health between men and women in the United States. Observing that cardiovascular disease in women remains under-researched and often misdiagnosed, the authors advocate for approaches that address women's heart health beyond individual behavior change, and include community, government, and neighborhood stakeholders. The post also describes the Alliance's Cities and Communities with Heart Initiative (CCHI), launched in 2017 to tackle cardiovascular health in mid-sized U.S. cities through five strategies: help women with access to prevention, care, and treatment; increase care availability; improve cardiovascular care; improve the science base for women's cardiovascular disease; and promote policies that sustain health equity and outcomes.

## **TED Talk: His and Hers... Healthcare**

Video. Johnson P. His and Hers... Healthcare. TED2013. [https://www.ted.com/talks/paula\\_johnson\\_his\\_and\\_hers\\_healthcare](https://www.ted.com/talks/paula_johnson_his_and_hers_healthcare).

GHELI repository link: <http://repository.gheli.harvard.edu/repository/10881>

This video from TED explores the different ways men and women respond to disease or treatment, and the implications for research and medicine. In this video, Dr. Paula Johnson discusses how ignoring the cellular differences between men and women means that society might be leaving women's health to chance.