

The Hidden Gaps: Unveiling the Impact of Overlooked Women's Health in Clinical Practice

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Executive Summary

HBA Think Tank in Collaboration with FemTechnology

While there is growing recognition of the importance of integrating sex and gender considerations into healthcare, the practical challenges faced by physicians remain largely overlooked. From the physician's perspective, the lack of clear guidelines and tools manifests in their day-to-day patient interactions, creating significant hurdles: physicians are expected to deliver equitable, personalized care in a system that lacks the data and protocols necessary to address the distinct health needs of women.

This gap creates uncertainty in clinical decision-making, exacerbates disparities in treatment outcomes, and places an undue burden on providers to fill in critical gaps on their own. Without the necessary tools, guidelines, and data to provide appropriate care, clinicians are more likely to dismiss women's concerns, leading to inadequate treatment.

This systemic failure is reflected in the **84% of women in the U.K. who report feeling dismissed by their healthcare providers** (Secretary of State for Health and Social Care, 2022) and that nearly **half (46%) of women aged 18 to 35 in the U.S. have reported negative experiences with healthcare providers** in the past two years (Long et al., 2023). As a result, **women spend 25% more time in poor health than men** (Pérez et al., 2024), underscoring the urgent need for actionable solutions that equip clinicians and center women's experiences.

This report explores the practical realities physicians face in the absence of sex-specific clinical data and guidelines, documenting their challenges, needs, and perspectives. By analyzing the direct impact on care delivery, identifying where gaps in knowledge lead to suboptimal outcomes, and highlighting successful integration models, this report proposes actionable pathways to support physicians in providing optimal care for women across medical specialties.

Physician responses were collected via an online questionnaire that included physicians from diverse practice settings and offered a broad perspective on healthcare delivery across the following specialties: **oncology, ophthalmology, endocrinology, cardiology, and neurology**. 200 physicians were surveyed in total. They were mostly male with over five years of patient care experience, representing a diverse range of geographic and economic contexts, including the **United States of America, Germany, Brazil, Thailand, Egypt, and Morocco**.

The Physician's Perspective: Gaps That Undermine Women's Health

In a world of breakthroughs in medicine – from genomics, precision medicine, and AI-driven diagnostics—a glaring gap remains: the lack of sex- and gender-specific data and guidelines in healthcare. Despite mounting evidence of critical biological, hormonal, and metabolic differences between men and women, these distinctions are often overlooked in research, clinical protocols, and treatment strategies. As a result, women frequently receive care based on models designed for men, leading to misdiagnoses, delayed treatments, and suboptimal outcomes. Bridging this gap is not just a matter of equity; it is essential to unlocking the full potential of modern medicine to deliver truly personalized and effective care. Indeed:

- **Over 53% of responding physicians cited insufficient sex and gender-specific research and treatment guidelines as a major concern in their ability to deliver clinical care.**
- **Nearly 47% acknowledged that systemic biases, including unconscious gender stereotypes, undermine the quality of care their patients receive.**
- **53% of respondents highlighted that cultural stigma and lack of awareness contribute to creating significant patient barriers, particularly in middle- and low-income countries, delaying symptom recognition and treatment.**
- **And even when women do go to access care, inadequate knowledge of sex-specific symptoms often results in missed referrals, compounded by limited access to specialists, which 45% of physicians flagged as a critical gap.**

These missed opportunities contribute to inefficiencies and poorer health outcomes for women, spanning multiple specialties, including oncology, ophthalmology, endocrinology, cardiology, and neurology.

200 PHYSICIANS SURVEYED ACROSS ONCOLOGY, CARDIOLOGY, OPHTHALMOLOGY, ENDOCRINOLOGY, NEUROLOGY

53% cited insufficient sex & gender research and treatment guidelines as a major concern in their ability to deliver clinical care

47% acknowledged that systemic biases, including unconscious gender stereotypes, undermine the quality of care patients receive

80% of physicians observe sex differences in disease progression & treatment response
yet less than **30%** feel equipped with resources to address them

Cancer care reveals stark sex and gender disparities in both treatment outcomes and clinical attention to patients' unique needs.

For instance, women face a 34% higher risk of severe side effects compared to men, with the disparity rising to nearly 50% for those undergoing immunotherapy (Winstead, 2022).

These findings underscore the critical need to integrate sex-specific insights into cancer care, emphasizing the importance of tailoring treatments to account for biological differences between men and women. Compounding this issue is the inequity in addressing the quality of life of female cancer patients.

For example, twice as many men (84% of men vs 40% of women) reported being informed about fertility preservation when undergoing cancer treatment and how to go about it (using gonadal or gamete cryopreservation: 71% of men vs. 15% of women), highlighting a pervasive gender gap in discussions about reproductive health during cancer care (Wide et al., 2021).

Another notable example is addressing the actual sexual side effects of cancer treatments. A recent study presented at the American Society for Radiation Oncology (ASTRO) Annual Meeting revealed that women's sexual health is significantly overlooked in oncology care.

Among patients receiving brachytherapy for prostate or cervical cancer at a high-volume cancer center, 90% of men were asked about their sexual health, compared to only 10% of women (Sexual Side Effects of Cancer Treatment Often Unaddressed With Female Patients, 2022).

This disparity persists in clinical trials nationwide, reflecting systemic biases that undermine comprehensive patient care.

Research Gaps and Sex and Gender-Specific Challenges

Physicians worldwide acknowledge that limited research on women's cancers hampers effective treatment and diagnosis. Among U.S. oncologists surveyed, 60% reported that current research heavily influences their clinical practices – underscoring the importance of ongoing research in shaping clinical practices, especially for sex-specific cancer care – yet 30% frequently encounter cases where insufficient research creates barriers to care. This lack of robust, sex-specific data not only affects clinical decisions but perpetuates inequities in outcomes for women. 70% of respondents emphasized the importance of sex-specific symptom research in improving diagnosis and treatment.

80% of responding physicians in the United States, Germany and Thailand, acknowledged that the lack of dedicated research into women's cancers has a tangible impact on patient care and that they frequently observe sex differences in cancer symptoms and disease progression, highlighting the need for deeper investigation into how these variations affect diagnosis and treatment.



Regional Perspectives on Cancer Care

High-Income Countries: U.S. and Germany

Physicians prioritize advancements in precision oncology and personalized hormone-sensitive treatments, especially for both breast and ovarian cancers (deemed a research priority by 90% of physicians). These innovations aim to tailor therapies to individual patients, enhancing outcomes and minimizing side effects. Despite advancements, the impact of sex-specific cancer research is viewed as moderate, with barriers to fully integrating findings into routine clinical care. Interestingly, lung and cervical cancer were called out by 50% of physicians as being research priorities - due to how these cancers manifest differently in women.

Middle-Income Countries: Brazil and Thailand

In Brazil, the primary focus is on breast, cervical, ovarian, and endometrial cancers. However, limited access to diagnostics and treatment options continues to hinder progress, underscoring the urgent need for scalable and affordable healthcare solutions. In Thailand, in addition to breast and ovarian cancers, there is a unique emphasis on lung cancer (with 80% of physicians emphasizing the need for additional research), reflecting regional health trends.

Low-Income Countries: Egypt and Morocco

In Egypt, emphasis is placed on early detection and patient education as critical to improving cancer outcomes. However, **60% of oncologists reported that current research has no tangible impact on their diagnostic and treatment approaches for cancers disproportionately affecting women.** This highlights a significant research-to-practice gap, suggesting that existing studies often fail to translate into actionable clinical protocols. Oncologists may lack access to relevant insights, or the research itself may inadequately address practical, sex and gender-specific challenges. In Morocco, affordable and accessible healthcare solutions tailored to regional needs remain a key focus for oncologists striving to address disparities. Early detection programs and improved patient education are also emphasized as essential steps toward better outcomes. In both Egypt (40%) and Morocco (60%), physicians perceive lung cancer as being an important area for additional research due to how it presents differently in both men and women.

Guidelines and Sex and Gender-Specific Insights

Despite their influence on cancer susceptibility, progression, survival, and therapy response, sex and gender differences in clinical care remain among the least studied factors in oncology. Current precision medicine approaches largely rely on mutational or genetic data to assign therapy, neglecting how a patient's sex may influence therapeutic efficacy or toxicity.

Emerging evidence demonstrates clear sex-based disparities in response rates and the likelihood of side effects among patients receiving chemotherapy. These differences are driven by biological variables, including variations in body composition, hormonal environments, and pharmacokinetics. However, most oncology trials fail to consider these factors systematically:

For example, analysis of the Trialstrove database reveals that only 0.5% of oncology clinical trials—472 out of 89,221—include curated post-treatment sex comparisons.

Among the 288 trials that compared survival, outcome, or response rates, 42% reported significantly better outcomes for females, while 16% favored males. Notably, trials of EGFR inhibitors in lung cancer and rituximab in non-Hodgkin's lymphoma consistently showed stronger responses in women.

Of the 44 trials comparing side effects, more studies reported significantly lesser toxicity in males (22 trials) than in females (13 trials) (Kammula et al., 2024). Sex is a critical factor influencing drug responses, yet it is often overlooked in oncology, leading to significant disparities in treatment outcomes and adverse drug reactions (ADRs).

Women are 1.5 to 2 times more likely than men to experience ADRs and are more frequently hospitalized due to drug toxicity.
(Martin et al., 2002)

These disparities stem in part from clinical trials that predominantly include men, resulting in dosing regimens that are not optimized for women's unique physiology. Women tend to have higher blood drug concentrations, slower elimination rates, and increased toxicity for many anticancer drugs, including cytotoxic agents and tyrosine kinase inhibitors. Despite well-documented sex differences in pharmacokinetics, such as variations in enzyme activity (e.g., CYP3A and P-gp) and renal function, sex-specific dosing regimens are rarely implemented. The recommended maximum tolerable dose for most chemotherapy drugs is derived from male-centric trials and fails to account for women's distinct body composition, contributing to higher toxicity rates in female patients (Rakshith et al., 2023).

To achieve true precision medicine, oncology must integrate biological sex and gender into treatment decisions, prioritizing tailored dosing strategies that improve efficacy while minimizing toxicity.

Endocrine disorders remain a critical yet under-researched area in women's health, with 90% of respondents identifying research gaps as having a moderate (45%) to significant (45%) impact on patient outcomes.

These findings underscore the need for deeper investigation into how endocrine conditions affect women across life stages, from puberty to pregnancy to menopause.

While 55% of clinicians report addressing sex and gender-based differences in treatment responses for endocrine disorders significantly, 36% acknowledge only moderate integration of these considerations into care. This highlights both progress and persistent limitations in delivering truly personalized, sex and gender-sensitive treatments.



Polycystic Ovary Syndrome (PCOS): A Universal Priority

Every surveyed endocrinologist identified PCOS as a top research priority. Affecting 10% of women of reproductive age, with 70% of cases going undiagnosed, PCOS exemplifies the unmet needs in women's health (Johnson, 2024). Its complications—ranging from infertility to diabetes and cardiovascular risk—demand urgent attention. Physicians emphasized the critical need for improved diagnostic tools and tailored treatment approaches to manage PCOS effectively. With such high prevalence, PCOS represents a significant opportunity for advancements in drug development and specialized healthcare solutions.

Thyroid Dysfunction: Bridging Diagnostic Gaps

Thyroid dysfunction, particularly during hormonal transitions like pregnancy and menopause, is another widespread yet often misdiagnosed or undertreated condition. The need for improved diagnostic accuracy and the development of sex-specific treatments was emphasized as being essential to closing these gaps and enhancing care quality and understanding how and why hormonal fluctuations exacerbate thyroid disorders, to enable comprehensive, life-stage-specific management was emphasized as being critical.

Osteoporosis: A Gendered Perspective

In Germany, 60% of respondents have called for a dual focus on osteoporosis and diabetes research, with particular emphasis on life-stage-specific needs. For osteoporosis, this means prioritizing preventive care for postmenopausal women, who face accelerated bone density loss due to hormonal changes. Meanwhile, diabetes research must account for hormonal interactions and transitions across key life stages such as pregnancy and menopause, areas where current treatment guidelines often fall short.

In Brazil, 80% of respondents identify osteoporosis as a top priority. This high level of concern likely reflects the condition's profound impact on women's long-term health. Postmenopausal women, in particular, bear a disproportionate burden of osteoporosis, driven by hormonal shifts that increase bone fragility. Despite these risks, treatment thresholds and fracture prevention strategies often lack gender-specific nuance, delaying effective interventions.

Globally, organizations like the National Osteoporosis Foundation (NOF) have championed sex-specific strategies to mitigate these risks. These include calcium and vitamin D supplementation, lifestyle modifications, and DXA scans for women at heightened risk. Such measures have proven effective in reducing fracture risks (Dy et al., 2011).

Meanwhile, broader trends in women's health underscore a growing demand for proactive and personalized care. In Germany, 100% of respondents emphasized the importance of early detection and preventive care in endocrinological health as making a significant impact on the care they are able to deliver. Furthermore, 80% of respondents in Germany highlighted the need for more personalized treatments, while 60% call for improved treatment effectiveness. These findings suggest that tailored approaches, designed with women's unique physiological and hormonal needs in mind, could significantly improve outcomes.



Additionally, specific life-stage needs were also emphasized as being important. Research into the management of conditions related to pregnancy, lactation (60%), and transitions across different life stages (20%) is particularly critical. These findings reflect a recognition that women's hormonal health requires a dynamic and nuanced approach, one that evolves alongside their changing needs.

Hormonal variations not only define endocrine health but also play a pivotal role in cardiovascular risk throughout a woman's life. From puberty to menopause and beyond, these changes create vulnerabilities that demand a comprehensive, integrated approach to care.

Conditions like gestational diabetes and preeclampsia are not just short-term issues but indicators of future cardiovascular challenges. These complications significantly increase the risk of hypertension, ischemic heart disease, and stroke, often manifesting years before menopause. Targeted follow-up and preventive care are critical to reducing these risks.

Hormonal shifts after menopause exacerbate metabolic and cardiovascular risks, requiring tailored preventive strategies to address this life stage's unique challenges. Postmenopausal women also experience changes in adipose tissue distribution, heightening cardiometabolic risks. Obesity amplifies coronary risk by 64% in women, compared to 46% in men, underscoring the need for sex-specific obesity guidelines that address these disparities (Wilson et al., 2002).



Women with diabetes face a 3-7 fold increase in ischemic heart disease risk compared to a 2-3 fold increase in men (Möller-Leimkühler, 2007).

Prevention and management strategies remain insufficiently tailored to women's distinct risk factors with Type 2 Diabetes, leaving them at higher risk for coronary heart disease and other vascular complications (Luiza de Castro, 2016).

Cardiovascular disease (CVD) is the leading cause of death among women worldwide, yet the way it manifests, is diagnosed, and treated reflects systemic inequities in healthcare. Across the globe, physicians and researchers acknowledge profound sex and gender differences in CVD symptoms and outcomes. However, a persistent lack of sex-specific research, diagnostic tools, and guidelines leaves millions of women at risk of delayed care, misdiagnosis, and suboptimal treatment.

Heart attacks in women often do not present with the "classic" symptoms of chest pain or tightness, as they typically do in men. Instead, women report nausea, fatigue, and shortness of breath—symptoms frequently dismissed or misattributed to other conditions. Similarly, heart failure in women often manifests as heart failure with preserved ejection fraction (HFpEF), a form of the disease that traditional diagnostic tools struggle to detect. These atypical presentations are not anomalies; they are the norm for women. Yet, the systems designed to detect and treat CVD are still largely built around male-centric models.

The consequences of these disparities are stark. Women are more likely than men to receive incorrect initial diagnoses for acute myocardial infarction, resulting in delayed treatment and worse outcomes. For conditions like coronary artery disease, women often experience non-obstructive forms that go undetected by traditional catheterization methods, further exacerbating the gap between diagnosis and treatment.

The challenges of addressing sex and gender disparities in cardiovascular care vary across countries and income levels:

In high-income countries such as the United States and Germany, physicians emphasize the need for advancements in stroke and heart failure research to address sex-specific differences. Yet, even in these advanced healthcare systems, integrating sex and gender-specific insights into practice remains a challenge. 60% of German cardiologists, for example, report frequent difficulties in diagnosing and treating heart disease in women due to the lack of robust research and guidelines.

In middle-income countries like Brazil and Thailand, the recognition of sex and gender differences in CVD is widespread, but access to diagnostics and advanced treatments remains a significant hurdle.

Brazilian cardiologists unanimously (100%) recognize that cardiovascular diseases manifest differently in women but note the absence of protocols that adequately address these differences.

Low-income countries, including Egypt and Morocco, face the dual challenge of limited resources and an absence of sex-specific guidelines. Physicians in these regions stress the critical need for early detection programs and public education campaigns to improve outcomes for women. However, systemic barriers, including a lack of affordable diagnostic tools, perpetuate delays in care.

These systemic gaps not only harm patients but also place a heavy burden on physicians: 77% percent of cardiologists report moderate to significant challenges in adapting male-centric protocols to female patients.

This challenge is also present in drug development and approval processes, where women are often underrepresented and their unique health needs overlooked.

For instance, over 65% of new drugs in the U.S. are approved through expedited pathways, which are associated with higher rates of adverse drug reactions.

A case in point is the cardiovascular drug Multaq (dronedarone), approved in 2009 as a safer alternative to amiodarone. Despite women's increased vulnerability to proarrhythmic effects due to their naturally longer QT intervals, they accounted for only 32% of participants in pre-approval trials on average, with none of the trials reporting sex-specific adverse drug reaction data. Post-approval studies revealed that women represented 66% of the Torsade de Pointes cases, a severe arrhythmia, with Multaq – the drug originally approved for being a safer alternative – surpassing its predecessor in adverse events by 2011 (Viehbeck, 2024). Further illustrating how male-centric approaches in research and regulatory processes exacerbates the challenges physicians face in delivering equitable care, endangering the lives of their female patients.

Progress and Opportunities: Tailoring Care for Women

Despite these challenges, progress is being made. New guidelines for heart failure now recognize that women more frequently experience HFpEF, prompting the development of tailored management strategies (2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines, 2022). Similarly, alternative diagnostic methods for coronary artery disease are being recommended to address the unique forms of the disease seen in women.

Stroke emerged as a priority for sex and gender-specific research in the survey with 100% of physicians emphasizing the urgent need for deeper research into how it uniquely affects women.

This aligns with recent guidelines from the American Stroke Association, published in the journal *Stroke*, where recommendations called for a heightened focus on sex-specific risk factors, prevention strategies, and tailored treatment approaches that address unique vulnerabilities throughout a woman's life such as the postpartum period, particularly the first two weeks after childbirth – which is one of the most dangerous times for stroke. Women in this phase face triple the stroke risk of their nonpregnant counterparts, with most strokes occurring post-delivery. Contributing factors include advanced maternal age, use of assisted reproductive technology, obesity, heart disease, infections, migraines, and autoimmune conditions like lupus.



Adverse pregnancy outcomes (APOs) further amplify stroke risk. Women who experience preterm deliveries, recurrent miscarriages, stillbirths, or placental abruption are more likely to develop cerebrovascular diseases, often at an earlier age.

Conditions like hypertensive disorders of pregnancy (e.g., preeclampsia), gestational diabetes, and delivering babies small for their gestational age also elevate risk (Bushnell et al., 2024). Alarmingly, 1 in 5 pregnancies in the U.S. results in an APO, and women with preeclampsia are four times more likely to suffer a stroke compared to those without (Pre-Eclampsia Linked With Four-Fold Higher Risk of Heart Attack in Decade After Delivery, 2023).

Beyond stroke, APOs signal broader long-term health risks. Evidence links these conditions to heart disease, atherosclerosis, kidney disease, and even dementia later in life. This underscores the need for comprehensive screening and aggressive treatment of stroke risk factors, particularly high blood pressure, among affected women. Physicians are encouraged to counsel women on lifestyle changes—such as regular physical activity, a healthy diet, and smoking cessation—that reduce their risk.

Emerging treatments and management strategies are also reshaping the landscape of stroke care. New drugs like semaglutide, a GLP-1 receptor agonist, show promise in reducing stroke risk while managing weight and diabetes. Providers are urged to discuss these options, along with potential risks associated with hormonal contraception, oral estrogen hormone therapy after age 59, early menopause, and conditions like endometriosis, which are unique to women.

Hypertension also emerged as a priority by the physicians surveyed –

with 78% pointing to the need for sex and gender-focused research to enhance treatment strategies and improve long-term management for women’s cardiovascular health.

Physicians in the survey stressed the importance of considering hormonal and physiological factors when managing blood pressure in women, particularly during life stages such as pregnancy and menopause.

A recent consensus statement, published in *Heart* developed collaboratively by the 21 societies affiliated with the British Cardiovascular Society (BCS), emphasizes a sex-based approach to tackle inequities and improve outcomes for women with cardiovascular disease (CVD).

The document reviews traditional and female-specific risk factors, such as hormonal changes during menopause, and examines key disease areas, including coronary artery disease, heart failure, valvular heart disease, and rhythm disorders. It also highlights service settings such as cardio-oncology, cardiac rehabilitation, noninvasive cardiovascular testing, and primary care, providing actionable recommendations to improve care delivery in each area. These “action points” aim to address gaps in treatment, improve access to specialist care and screening, and ensure appropriate management of female-specific conditions.

The American Heart Association (AHA) and the European Society of Cardiology have also introduced sex-specific protocols to address the unique cardiovascular risks women face, marking a significant step toward more inclusive and effective healthcare.

The AHA has refined its stroke prevention guidelines to incorporate women’s unique risk factors, emphasizing the importance of tailored care. Pregnancy and preeclampsia, for example, are now recognized as major contributors to long-term cardiovascular complications, necessitating follow-up care to mitigate risks. Similarly, hormonal influences—such as estrogen-containing contraceptives and hormone replacement therapies—are flagged for their potential to elevate stroke risk, particularly in women with pre-existing vulnerabilities. The updated guidelines also address cholesterol management, acknowledging sex-based differences in lipid profiles and how women respond to treatments, underscoring the need for personalized approaches.

In a landmark statement, the AHA has called for a critical shift in research on acute myocardial infarction, emphasizing the need for sex-specific evidence. Historically, male-centric studies excluded key data on women’s experiences, from symptoms to treatment responses.

Sex-specific factors play a critical role in prevalence, progression, and treatment outcomes in neurological disorders. Yet, despite increasing awareness, care protocols remain insufficiently adapted to these differences, leaving significant gaps in women's healthcare.

Migraines are a striking example, identified by 90% of surveyed physicians as a critical concern. Women experience migraines three times more often than men, with hormonal fluctuations during menstruation, pregnancy, and menopause frequently acting as triggers.

Migraines and PMS:

Rapid hormonal fluctuations are a known trigger for migraines, while more stable changes tend to be protective. The sharp drop in estrogen levels during ovulation and menstruation can provoke migraine attacks. Around 50-60% of women with migraines experience menstrual migraines, which typically occur just before or during menstruation. These migraines are often more intense and longer-lasting compared to those experienced at other times of the month.

Migraines and Pregnancy:

Migraine patterns during pregnancy can vary, but most women notice improvement or even complete resolution, particularly in the second and third trimesters. This relief is largely attributed to the steady rise in hormones, including estrogen, throughout pregnancy. However, migraines can worsen during the first trimester for some women, often exacerbated by challenges like morning sickness, poor sleep, and dehydration, which are common triggers.

Migraines and Perimenopause:

Migraine attacks often increase during perimenopause due to fluctuating hormone levels. About half of women with menstrual migraines experience more frequent attacks during this transitional phase, which is often accompanied by symptoms like disrupted sleep, chronic pain, and depression. With menopause, hormone levels stabilize at lower levels, leading to fewer migraines for most women. Some may even experience complete resolution of their migraines. However, a minority of women may see no improvement or a worsening of symptoms. In such cases, treatments like hormone replacement therapy or other medications may be explored to manage migraines effectively.

For women, migraines tend to peak during hormonally active stages of life, particularly during **menstruation, pregnancy, and perimenopause**. In contrast, men typically experience their most severe migraines during early adulthood, often in their 20s, 30s, and 40s. While the underlying reasons for men's migraine patterns are less understood, they are thought to involve a mix of genetic predispositions, environmental factors, and lifestyle influences.

As a whole, women are also more likely to suffer from more frequent, longer-lasting, and more disabling migraine attacks and experience more pronounced symptoms, including nausea, vomiting, phonophobia (sensitivity to sound), photophobia (sensitivity to light), and cutaneous allodynia (heightened sensitivity to touch). Consequently, women are more likely to seek help from specialists and rely on prescription medications compared to men. Mental health issues, such as anxiety and depression, are also more commonly associated with migraines in women, while men with migraines are more likely to face physical health concerns like obesity. Furthermore, women are more likely than men to seek emergency care for severe migraine attacks.

According to the 2015 Global Burden of Disease study, migraines ranked fourth in years lived with disability among women and eighth among men. Women are 1.34 times more likely than men to report severe disability from migraines, underscoring its impact on quality of life.

Despite this, current guidelines for acute and preventive migraine management generally do not differentiate between men and women, except in the case of menstrual migraines. For acute treatment, recommendations are consistent across genders, regardless of menstruation. However, guidelines for women include additional options such as targeted perimenstrual prophylaxis or hormonal therapy to manage menstrual-related migraine attacks, highlighting the need for more targeted therapies and personalized care that accounts for these unique triggers (Vetvik & MacGregor, 2017).



Similarly, Multiple Sclerosis (MS) disproportionately affects women, making up a high-priority area for sex-specific research according to 80% of respondents.

MS presents unique challenges during hormonal milestones such as pregnancy, postpartum, and menopause. Limited understanding of how hormonal changes influence disease progression leaves women navigating complex intersections of reproductive and neurological health without adequate support. Physicians emphasize the importance of multidisciplinary care, including tailored treatment plans that align with women's pregnancy and family planning goals, as well as coordinated care during pregnancy and postpartum.

Historically, women with MS were discouraged from pursuing pregnancy due to concerns about potential harm to the fetus, increased obstetric risks, or impaired fertility. However, evidence suggests that fertility is generally not significantly reduced in women with MS, and pregnancy is indeed possible with appropriate planning.

Discussions about pregnancy should be an integral part of MS management. Many women with MS avoid pregnancy due to fears of complications or lack of awareness about the generally positive relationship between pregnancy and the disease. During pregnancy, MS relapse rates often decline, but the risk of relapse peaks 3–6 months postpartum. For this reason, timely resumption of disease-modifying therapies (DMTs), particularly for women with highly active disease, is crucial. Since the safety of DMTs during lactation varies, treatment plans must consider both the mother's health and breastfeeding goals (Bernard, 2024).

In the case of Alzheimer's disease, women account for nearly two-thirds of patients and experience faster cognitive decline than men, despite similar disease onset. Emerging research suggests that hormonal changes, particularly during menopause, may accelerate disease progression. However, these factors remain underexplored, underscoring the need for focused studies on the biological and hormonal drivers of Alzheimer's—with 50-100% of responding physicians, depending on their country of origin, emphasizing the importance of such research to develop effective prevention and treatment strategies.

For women with epilepsy, hormonal changes significantly influence seizure patterns and medication efficacy. Yet, these variations are insufficiently studied, creating barriers to effective care – as emphasized by 50% of physicians.

Parkinson's disease also shows sex-specific differences, with men experiencing more rigidity and women reporting more tremors. While guidelines are beginning to account for these distinctions, further refinement is needed to ensure truly personalized care.

The challenges in addressing sex-specific neurological conditions vary across regions and income levels. In the United States, there is a clear call for more research on conditions like migraines, MS, and Alzheimer's, particularly focusing on hormonal influences during pregnancy and menopause.

In Thailand, 100% of surveyed neurologists agreed that hormonal changes significantly affect women's neurological health, but they noted that current treatment protocols only moderately account for these differences.

In Egypt, the lack of sex and gender-specific neurological research results in substantial diagnostic and treatment challenges, leaving women disproportionately underserved.

Despite growing awareness of the impact of sex and gender on neurological health, treatment protocols remain inconsistently adapted.

Physicians report that while sex and gender differences are moderately acknowledged, they are rarely integrated into clinical practice.

Addressing this gap by developing therapies that account for hormonal influences and other sex and gender-specific factors represents a significant opportunity to improve outcomes.

With an aging population and a rising prevalence of chronic diseases, the incidence of eye diseases is projected to double by 2050, disproportionately impacting women.

75% of ophthalmologists surveyed believe hormonal changes, such as those during pregnancy and menopause, significantly affect women's retinal health and warrant further research.

Hormonal fluctuations do indeed play a critical role in women's eye health. For instance, dry eye disease (DED) is twice as common in women, particularly post-menopause, as declining estrogen levels exacerbate symptoms and reduce quality of life.

Hormonal changes during pregnancy and menopause often act as "stress tests," worsening preexisting conditions. Pregnancy, for example, can accelerate diabetic retinopathy due to hormonal and metabolic shifts, while complications like preeclampsia can result in severe ocular issues, including retinal detachment and cortical blindness.

Autoimmune diseases, which predominantly affect women, further contribute to disparities in eye health. Conditions such as rheumatoid arthritis and systemic lupus erythematosus frequently cause ocular complications like uveitis and scleritis. Additionally, women are more prone to age-related macular degeneration (AMD), the leading cause of irreversible vision loss in older adults. With longer life expectancy, women bear a greater burden of AMD, which not only causes functional impairment but is also linked to mental health issues like anxiety and depression. Current therapies, such as anti-vascular endothelial growth factor (anti-VEGF) treatments, may stabilize vision loss but fail to reverse it, underscoring the urgent need for research into curative solutions (Aninye et al., 2021).

Globally, AMD and diabetic retinopathy were prioritized for research by the physicians surveyed, yet the influence of hormonal and sex-specific factors remains underexplored, leaving critical gaps in care and outcomes. In high-income countries, these conditions dominate research agendas, with growing interest in sex-specific disease mechanisms. Middle-income countries like Thailand face significant challenges with AMD and uveitis, presenting opportunities to enhance research and clinical practices. In low-income countries such as Egypt, AMD and diabetic retinopathy are the primary concerns, with notable gaps in sex-sensitive treatments and preventive strategies.

Sex disparities in retinal health are clear but insufficiently addressed. AMD, identified by 89% of survey respondents as the most pressing condition, reflects a growing recognition of the unique ways retinal diseases affect women. Other conditions, including uveitis, retinal vein occlusion, and diabetic macular edema, were cited by 33% of respondents as requiring more focus. Meanwhile, **47% observed sex-specific variations in retinal conditions**, though these differences are inconsistently recognized in clinical practice. In regions like Germany, for instance, only 50% of ophthalmologists believe hormonal changes have even a slight impact on retinal health, revealing a widespread underestimation of their effects and a **need for greater clinician education and awareness.**

Opportunities for Innovation As Highlighted By Respondents

1. Developing advanced technologies for early detection and personalized treatments could significantly improve outcomes for women disproportionately affected by retinal diseases.
2. Public health initiatives and lifestyle interventions focused on modifiable risk factors offer a promising avenue for reducing disease burden.
3. Increasing awareness and training on sex-specific factors in retinal health to bridge the gap between research and practice, ensuring better patient outcomes.
4. Understanding the influence of hormonal fluctuations to pave the way for preventive strategies tailored to women's unique needs.

57% of physicians report that existing treatment protocols fail to adequately account for sex differences, emphasizing the need for more inclusive approaches in retinal care.

CARDIOLOGY	ENDOCRINOLOGY	NEUROLOGY	OPHTHALMOLOGY	ONCOLOGY
<p>77%</p> <p>report moderate to significant challenges in adapting male-centric protocols to female patients</p>	<p>90%</p> <p>identified research gaps as having a moderate to significant impact on patient outcomes</p>	<p>80%</p> <p>believe hormonal changes affect neurological health of women & requires further research</p>	<p>75%</p> <p>believe hormonal changes significantly affect women's retinal health but lack guidelines</p>	<p>80%</p> <p>frequently observe gender differences in cancer symptoms & diseases progression</p>
STROKE	PCOS	ALZHEIMER'S	RETINAL VEIN OCCLUSION	LUNG CANCER
HEART FAILURE	THYROID DISORDER	MIGRAINES	UVEITIS	OVARIAN CANCER
HYPERTENSION	DIABETES	MULTIPLE SCLEROSIS	DIABETIC RETINOPATHY	BREAST CANCER
HEART ATTACK SYMPTOMS	OSTEOPOROSIS	EPILEPSY	AGE-RELATED MACULAR DEGENERATION	ENDOMETRIAL CANCER

In Conclusion - A Gap That Spans Medicine and Geographies

The barriers to equitable healthcare for women manifest differently across high-, middle-, and low-income countries, shaped by economic resources, cultural norms, and healthcare infrastructure. Despite these differences, a shared need for sex and gender-specific research and treatment emerges as a unifying priority across geographies.

In both the United States and Germany, physicians identified the lack of sex- and gender-specific treatment guidelines as a core barrier to improving care. They emphasized the need for advanced diagnostic tools and personalized care, particularly for conditions such as polycystic ovary syndrome (PCOS), multiple sclerosis (MS), and cardiovascular disease. Additionally, there was a strong call to integrate and research the impact of hormonal influences across medical specialties, highlighting the importance of precision medicine in addressing these gaps.

In Brazil and Thailand, socioeconomic inequities and cultural norms delay women's access to timely care, creating significant barriers to effective treatment. Physicians emphasized the need for sex- and gender-sensitive advancements in managing cancer, cardiovascular disease, and neurological conditions. Priorities include expanding early detection programs, patient education initiatives, and understanding the hormonal impacts on conditions such as migraines and diabetes.

In Egypt and Morocco, barriers such as financial constraints and entrenched cultural biases significantly hinder women's access to care. Physicians highlighted the urgent need for accessible diagnostic tools and grassroots education campaigns. Priorities center on closing diagnostic and treatment gaps in oncology, endocrinology, and cardiology, with a focus on reaching underserved and marginalized populations.

Examples of Institutions Across the Globe Tackling this Gap:

Globally, a growing number of institutions are addressing the critical gaps in sex- and gender-specific healthcare by focusing on shared priorities: identifying biases in care delivery, integrating sex- and gender-sensitive approaches into research and practice, and fostering interdisciplinary collaborations to advance treatment standards. These efforts aim to embed sex and gender considerations into the very fabric of medicine, from understanding disease mechanisms to translating research into actionable clinical improvements.

Institutions like the Gebhard Lab in Switzerland, the Berlin Institute of Health's Center for Sex and Gender Medicine in Germany, Sweden's Karolinska Institutet's Centre for Gender Medicine, and Brigham and Women's Hospital: The Connors Center for Women's Health and Gender Biology in the United States exemplify these priorities in action. Each is uncovering sex- and gender-specific factors that shape diseases, developing educational materials to raise awareness among clinicians and the public, and ensuring medical research incorporates sex- and gender-sensitive metrics.

Mount Sinai's Women's Heart and Vascular Center is a specific example of addressing the unique cardiovascular risks faced by women. This multispecialty center is dedicated to screening, assessing, and educating women about their individual heart health, offering comprehensive care that includes counseling, support groups, nutritional guidance, and stress management programs. By prioritizing conditions such as diffuse artery narrowing and small vessel disease—disorders that disproportionately affect women but are often underdiagnosed—the center ensures personalized and effective treatment for female patients to overcome the fact that women are often stereotyped into certain health categories, overlooking the fact that many are actually experiencing heart disease.

The center actively reaches out to women at high risk, including those who have experienced pregnancy-related complications such as preeclampsia, gestational diabetes, premature delivery, or low-birth-weight infants. Female cancer patients also receive specialized evaluations, as chemotherapeutic agents and radiation are known to negatively impact cardiovascular health.

Looking ahead, Mount Sinai's clinics are preparing to address emerging challenges such as spontaneous coronary artery dissection (SCAD), ischemia, myocardial infarction with nonobstructive coronary arteries (MINOCA), and peripheral arterial disease, which often affects women at younger ages.

Stanford University's Gendered Innovations Project develops practical methods of sex and gender analysis for scientists and engineers. By collaborating with entities like the European Commission, the project aims to enhance research quality and stimulate novel designs across various fields. Its case studies demonstrate how integrating sex and gender analysis leads to discoveries and innovations, such as improving machine translation algorithms to avoid sex and gender bias.

Canada's Women's College Hospital focuses exclusively on women's health research. They have the largest women's mental health program in Canada, which explores biological and social factors shaping women's mental health. Additionally, the hospital implements ambulatory care models to reduce barriers for women accessing healthcare, considering their daily obligations and family responsibilities

The message is clear: *physicians are ready for change.*

The systemic disregard for sex-based differences creates profound gaps in care:

- **Over 80% of physicians in the survey reported observing sex differences in disease progression and treatment response, yet fewer than 30% feel adequately equipped with resources to address them.**
- **Diagnostic age disparities leave women navigating advanced conditions, as men are typically diagnosed earlier (on average 4 years earlier) across most disease categories (Westergaard et al., 2019).**

By continuing to view women's health needs as deviations rather than essential considerations, healthcare fails to provide equitable, effective care for over half the population.

Sex: The First Step Toward Personalized Medicine

Addressing these disparities begins with recognizing that sex is the cornerstone of personalized care. It is not an anomaly but a fundamental determinant of health. Building healthcare systems around women's needs isn't just about equity—it's a gateway to groundbreaking discoveries in medicine, unlocking insights about the entire population by addressing the 51% of the population historically overlooked. Women's unique hormonal environments, body compositions, and disease manifestations are key to understanding not only their health but also broader human health patterns.

To integrate women-centric practices into healthcare systems and medical guidelines, we must focus on the following key pillars that redefine care delivery:

1. Collecting Data and Closing the Gaps: Real-World Data to Establish Sex-Specific Guidelines

- **Capture the Missing Data:** Women's hormonal, metabolic, and physiological differences remain under-researched, leaving gaps in care that perpetuate misdiagnoses, inappropriate treatments, and poorer outcomes. Establishing data systems to systematically collect and analyze these differences is foundational to closing this gap.
- **Translate Data Into Action:** Without tailored diagnostic criteria, treatment protocols, and prevention strategies, healthcare systems default to male-centric models that fail to address women's needs. These frameworks must be data-driven, actionable, and adaptive.
- **Amplify Patient Voices:** Systematically collecting patient-reported experiences ensures that care is not only informed by clinical guidelines but also reflects lived realities, aligning healthcare delivery with patient priorities.
- **Real-Time Adaptation:** Current care pathways are often rigid, failing to evolve with patients' changing needs. Tools that integrate real-time analytics and decision-tree logic can dynamically adjust care, improving outcomes and preventing escalation.
- **Close the Feedback Loop:** Aggregated insights, drawn from patient interactions, can transform individual experiences into system-wide improvements. This creates a self-reinforcing cycle where every patient encounter enhances care for the next.
- **Actionable Insights for Clinicians:** By making patient inputs accessible and actionable, these systems empower clinicians to deliver more precise, effective care.

Why It Matters: Women face a significantly higher risk of severe side effects in many treatments, as seen in oncology.

Without sex-specific insights, these disparities will persist, increasing the risk of harm and widening inequities in care.

One way companies can take action is by engaging with the HBA Think Tank. Women's health and wellness is a core pillar of the HBA Think Tank, which serves as a collaborative hub for companies seeking actionable strategies to redefine women's health. Through actionable insights, expert collaboration, and benchmarking resources, the Think Tank helps organizations transform their approach to women's health and wellness. Member companies gain access to best practices, research collaborations, and customized solutions that not only improve health outcomes for women but also establish their leadership in workplace equity and innovation.

2. Redefining the Baseline: Expanding the Definition of Women's Health

Women's health is not a niche issue but a cornerstone of personalized medicine:

- **Beyond "Bikini Medicine":** Traditional models focus narrowly on reproductive health while ignoring the systemic impacts of conditions like cardiovascular disease, neurological disorders, and metabolic syndromes. Expanding the lens of women's health reveals opportunities for innovation across all organ systems.
- **Women as the Healthcare Baseline:** Women are the majority of healthcare consumers and decision-makers, yet their needs remain underserved. Addressing these gaps isn't just a matter of equity—it's the key to creating healthcare systems that serve everyone better.
- **Standardization Through Sex-Specific Guidelines:** Current medical guidelines fail to reflect sex-specific metrics, leading to inconsistent diagnoses, delayed treatments, and poorer outcomes. Establishing these standards is essential for ensuring equitable and effective care delivery.

What's Needed: Solutions that combine patient-reported data, real-time analytics, and actionable frameworks to create a new gold standard for care delivery. These tools not only address immediate patient needs but also drive long-term systemic change.

3. Centralizing Resources: Building a Model of Care That Works for Women

- **A Fragmented System:** Women navigate a healthcare system that fragments their care, focusing narrowly on individual symptoms or organ systems rather than the interconnected nature of their health. Providers often lack the training to address overlaps, such as how reproductive transitions—pregnancy, menopause, puberty—impact cardiovascular, mental, and autoimmune health. This fragmented approach leads to missed diagnoses, inadequate follow-ups, higher costs, and added stress, placing the burden of coordination squarely on women's shoulders.
- **Beyond Siloed Care:** Women's health is not a series of isolated conditions but a dynamic, interconnected system. Current models fail to account for the overlap between reproductive transitions, chronic conditions, and caregiving responsibilities. Addressing these complexities isn't just about meeting women's unique needs—it's about designing healthcare systems that function better for everyone. Centralized care models that integrate sex-specific science, holistic diagnostics, and personalized pathways can create opportunities for earlier intervention, more effective treatments, and reduced inequities.

Why It Matters: Women are the cornerstone of healthcare—serving as the majority of patients, caregivers, and decision-makers—yet they are consistently underserved. Addressing this isn't just a moral imperative; it's an opportunity to transform healthcare. By building a system that connects biological realities with social contexts and personal priorities, we can reduce inefficiencies, lower costs, and improve outcomes. **Tailored, centralized care isn't just a solution for women—it's a roadmap to a more equitable, effective healthcare system for everyone.**

An example of centralized care is ORI (www.ori.care) – a personalized health navigation platform designed to close gaps in women’s healthcare, reduce employer costs, and improve employee outcomes. By centralizing best-in-class solutions in women’s health and providing actionable data on workforce health trends, ORI helps organizations uncover hidden cost drivers, optimize benefit utilization, and implement actionable, tailored strategies for women’s health. Employers gain a nuanced understanding of their workforce’s needs through anonymized, aggregated data, along with evidence-based recommendations and targeted interventions to reduce absenteeism and healthcare expenses. Employees benefit from seamless access to personalized care options, ensuring their unique health needs are met effectively and efficiently.

4. Incentivizing Change: Bridging the Gap Between Innovation and Implementation

Much of the progress in women’s health has focused on improving the frontend—awareness campaigns, diagnostics, and patient engagement tools. However, true transformation requires a fundamental shift in the backend: the treatments, protocols, and care pathways being prescribed. To achieve this, it is crucial to:

- **Mandate Training Programs in Sex and Gender Medicine:** Equip clinicians with the tools and knowledge to deliver equitable care by embedding sex and gender differences into medical education and ongoing training. Technology can support this through adaptive learning platforms, case-based simulations, and real-time clinical decision support systems.
- **Foster Cross-Sector Collaboration:** Break down silos between diagnostics, therapeutics, and digital health to create integrated care models. For example, digital platforms can link patient-reported outcomes to pharmaceutical research, ensuring new therapies reflect real-world needs. Collaboration between pharmaceutical and medtech companies, payers, and startups can fast-track innovation by aligning incentives and leveraging each sector’s strengths.
- **Prioritize and Incentivize the Disaggregation of Sex and Gender Data:** Current datasets often obscure sex-specific trends, leading to blind spots in diagnosis and treatment. By establishing policies that require disaggregation, stakeholders can unlock actionable insights that drive precision medicine. Incentivizing this process through regulatory rewards or funding opportunities can make it a priority across the healthcare ecosystem.
- **Leverage Technology to Bridge the Backend Gap:** Digital health platforms and AI-powered analytics can identify disparities in real time, analyze patterns in treatment outcomes, and suggest adjustments to care protocols. Advanced decision-support tools can guide clinicians toward sex-specific treatments, reducing errors and improving outcomes. These technologies also enable pharmaceutical companies to test therapies in more targeted ways, reducing costs and increasing efficacy.

- **Provide Tangible Incentives for Stakeholders to Innovate: Incentives are key to catalyzing action:**
 - **Pharmaceutical and Medtech Companies:** Reward firms that develop therapies, diagnostics, and devices tailored to women's biological and social realities with extended patents, faster regulatory approvals, or access to additional research funding.
 - **Startups:** Offer grants and tax incentives to companies creating digital health solutions that integrate seamlessly into care pathways and prioritize sex-specific insights.
 - **Payers:** Establish reimbursement models that reward outcomes-driven care aligned with women's unique needs, encouraging providers to adopt sex-specific protocols.
- **Positioning for First Movers:** Pharmaceutical and medtech companies and healthcare systems that act now will lead the charge in reshaping care. By adapting their backend systems to incorporate sex-specific protocols, first movers will:
 - Gain a competitive advantage in capturing the rapidly growing women's health market.
 - Build trust and loyalty among patients by delivering more effective, personalized care.
 - Drive research breakthroughs that could extend into broader precision medicine applications.
 - Establish themselves as industry leaders, setting the standard for equitable, innovative healthcare.

Why It Matters: The backend of healthcare—how treatments are prescribed, protocols are designed, and outcomes are measured—remains outdated and poorly equipped to meet the needs of half the population. Without incentivizing systemic change, progress on the front end will stall, and the potential for breakthroughs will remain untapped. First movers who invest in these changes now will not only improve health outcomes but also shape the future of healthcare, reaping financial and reputational rewards in the process.

Call to Action

The time to act is now. Healthcare providers have overwhelmingly expressed the desire and need for actionable, sex-specific guidelines to deliver equitable care. They require research that doesn't just sit in academic journals but translates into practical protocols, alongside systemic reforms that prioritize women's health across specialties and life stages.

Without these changes, the consequences ripple far beyond individual patients—delays in diagnosis and treatment drive up costs, extend recovery times, and strain already overburdened healthcare systems. Trust erodes, leaving patients, particularly women, underserved and unseen.

This is not just about filling a knowledge gap—it's about redefining healthcare and establishing a blueprint for the future. For too long, male-centric data has been treated as the default, leading to the dismissal of women's symptoms as anomalies and perpetuating inequities in care. Current clinical models and diagnostic algorithms overlook symptoms in women, delaying diagnoses and treatments.

The rise of artificial intelligence (AI) risks compounding these issues, as biased datasets reinforce male-centered norms in care. This doesn't just harm women—it undermines the very promise of personalized medicine.

By finally studying and addressing the health needs of the 51% of the population that has been historically overlooked, we unlock the potential for unprecedented medical breakthroughs. Women's health is not a niche—it is the foundation for understanding health at large, holding the key to transforming care for everyone.

The challenge is clear, and the demand – as evidenced by this survey – is undeniable: we must create systems that equally prioritize women's health, invest in research that bridges knowledge into practice, and adopt tools and technologies that address gaps at scale. Groundbreaking research, emerging technologies, and shifting societal priorities have already laid the foundation for both success and progress. Those who act now have a unique opportunity to capitalize on a significant market while shaping a healthier, more equitable society—driving innovation, reducing costs, and creating a healthcare system that serves everyone. The leaders who step into this space today have an unparalleled advantage, reaping both economic rewards and the lasting impact of driving meaningful change

The question is no longer why but who. Who will rise to this challenge and seize the moment to reimagine healthcare for all? The time to act is now—will you lead the way? We believe you can and hope you will.

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A collaboration between the [HBA Think Tank](#) and [FemTechnology](#), this survey was completed by 200 physicians from the United States, Germany, Brazil, Thailand, Egypt, and Morocco. Responses were collected via an online questionnaire that included physicians from diverse practice settings and offered a broad perspective on healthcare delivery across the following specialties: oncology, ophthalmology, endocrinology, cardiology, and neurology.

Physician respondents were mostly male with more than five years of patient care experience, representing a diverse range of geographic and economic contexts.



FemTechnology is a company dedicated to building the future of women's healthcare by addressing the gender health data gap and driving innovation across the women's health ecosystem. From their global FemTechnology Summit, which brings together thought leaders to catalyze change, to their university series, which scouts groundbreaking research and amplifies its impact, FemTechnology connects insights to action. At the core of their work is ORI, a personalized health navigation platform that centralizes best-in-class solutions in women's health. ORI collects and analyzes data to uncover hidden cost drivers, provide actionable workforce insights, and implement tailored strategies. It empowers employers to reduce healthcare expenses, optimize benefits, and improve employee outcomes while ensuring women have seamless access to personalized care that meets their unique needs. For more information, please visit www.femtechnology.org.



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The Healthcare Businesswomen's Association (HBA) is a global organization dedicated to furthering the advancement and impact of women in the business of healthcare. With more than 80 locations throughout the world, the HBA serves a community of more than 85,000 individuals and nearly 150 Corporate Partners. The HBA provides access to industry thought leaders and influencers; educational programs to develop leadership skills; and distinctive global recognition of outstanding individuals and companies to promote visibility of their achievements in advancing gender parity in the workplace.



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